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Laissez Faire Education Policy: Organization and Equity in School Choice

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Laissez Faire Education Policy: Organization and Equity in School Choice

By

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B.A. Spelman College, 1997
M.A. Wake Forest University, 1999

Advisor: Regina Werum, Ph.D.

An Abstract of
A dissertation submitted to the Faculty of the Graduate
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ABSTRACT

The debate surrounding school choice has become increasingly polemical in recent years. While advocates of choice suggest that it will combat inequality and increase achievement, opponents contend that choice may be transforming inequality, shifting disparities that were once a between-school problem and making them a within-school occurrence.

This study examines the effect of school choice on three aspects of education: school governance and organization, school-level achievement, and inequality in student-level achievement and track placement/advanced course-taking. I use two competing theoretical frameworks to explain the relationship between choice, organization, achievement, and tracking: a market model favored by economists and conflict model rooted in sociological traditions.

I use data from the Educational Longitudinal Study (ELS) of 2002 and 2004 to evaluate the effects of school choice. The results of this study suggest that public choice options do little to enhance school organization and school-level achievement gains. Private choice options, particularly Catholic schools, have significant positive effects on school organization and school-level achievement gains. Moreover, rather than reducing the SES gap in achievement, public schools of choice and private schools *increase* this gap. Although tracking was theorized to be the causal mechanism perpetuating this effect, my findings indicate that choice schools do not intensify racial or SES differences in curricular tracking. Instead, private choice options *attenuate* the SES gap in tracking and advanced course-taking. However, racial and economic diversity mediate the track placement of students in public schools of choice. Low SES and minority students in racially and economically diverse choice schools are less likely to be in the academic track while high SES and White students are more likely to be in the academic track.

The findings generated here have important implications for public policy initiatives like No Child Left Behind aimed at increasing achievement levels and reducing race and income-based disparities in education via school choice. If poor and minority parents must rely on public and private choice options to flee failing schools, choice may not deliver on its promise of enhancing outcomes for these students, at least in terms of achievement.

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CHAPTER ONE

INTRODUCTION

- **lais·sez-faire** French *laissez faire,* imperative of *laisser faire* to let (people) do (as they choose) - a philosophy or practice characterized by a usually deliberate abstention from direction or interference especially with individual freedom of choice and action (Merriam Webster)

The perception persists that American schools are in crisis and need reform. Tyack, Lowe, & Hansot (1984) argued that the American educational crisis is greater in the present era than during the Depression, not simply because of the scarcity of funds ever-present during the Depression, but because public confidence in education has eroded significantly over the years. Despite the retrenchment of the Depression, the public remained committed to public education and looked valiantly on teachers and school administrators. However, it is this commitment to public education that has diminished drastically in the present era, especially since the 1980s.

Historically, the discourse surrounding the perceived problems in American education have centered around control - communities seeking local (or "decentralized") control of schools and parents demanding more involvement in curriculum planning and development. In the late 19th and early 20th centuries, immigrant parents and politicians were locked in a struggle with WASP business and administrative elites over control of urban education (Reese 1986; Tyack 1974). By the 1950s and 1960s, Southern whites were fighting for local control of public education in response to early federal directives calling for the desegregation of Southern schools.

The most recent incarnation of local and/or parental control comes in the form of No Child Left Behind, a federal act which mandates the use of standards and testing to assess the progress of America's children and also grants students the freedom to leave failing schools and *choose* a higher quality alternative. Hence, choice is now a central focus of education reform. But granting students and parents some degree of control has not come without contestation. No Child Left Behind is a highly controversial piece of legislation – for a number of different reasons. First, underfunding by the federal government has made it difficult for many states to comply with provisions of the law. Moreover, early indicators suggest that the reforms imposed by No Child Left Behind have had little effect. Recent reports suggest that students were making greater gains prior to the passage of No Child Left Behind and that the White-minority gap closed only modestly as a result of stipulations made by No Child Left Behind (Dillon 2005a). Finally, because No Child Left Behind makes equity one of its primary goals and in turn focuses on the lowest achieving students, some argue that the law hinders high achieving children (Dillon 2008; Janofsky 2005).

Although a faction of parents have always opted out of public schools in favor of private schools, the increasing number of alternatives has given choice a broader and more viable appeal. In recent years, the debate surrounding school choice has become increasingly contentious and polemical. On the one hand, school choice advocates maintain that choice will solve many of the problems currently plaguing American education, including racial and socioeconomic segregation, low student achievement, and poor teacher performance to name a only a few. On the other hand, critics charge that school choice policies may be *exacerbating rather than ameliorating* educational

inequalities. Opponents contend that school choice will not will exacerbate racial and economic segregation (Astin 1992; Henig 1994). Moreover, some research indicates that choice may not necessarily enhance achievement and may even create a new set of problems for students escaping to schools of choice, including social and academic isolation (Fuller 2002; Wells 1996; Wells, Holme, & Vasuveda 2002).

Though choice is generally considered to free schools from bureaucratic constraints, empower parents and teachers, and combat inequality, some research suggests that choice systems do not succeed in achieving all of these goals (Vasuveda & Grutzick 2002; Wexler & Huerta 2002; Zernicke 2002). Thus, while some evidence suggests that choice programs free teachers and school administrators from bureaucracy and mediocrity (Chubb & Moe 1990; Fliegel 1993), other research suggests that choice does not increase innovation among teachers and does not enhance performance among students (Bancroft 2003; NCES 2003a).   Similarly, other research indicates that more advantaged parents are able to "manage" choice programs in ways that benefit their children and disadvantage the poor and minority parents who escape to choice programs from failing inner-city schools (Wells, Holme, & Vasuveda 2002). According to this research, advantaged (white, middle, upper-class) choice parents erect barriers to limit the access of disadvantaged students to choice schools and to the best programs within choice schools. As poor and minority parents flee failing schools, choice schools may become "new and improved sorting machines" that mask inequality under the guise of choice (Moore & Davenport 1990). Consequently, choice may not be ameliorating inequality at all. Instead the appearance of choice may only conceal an underlying system

of inequality within schools. Parents choosing to flee regular public schools for choice schools may discover that the more things change, the more they stay the same.

RESEARCH QUESTIONS

The purpose of this dissertation is to examine school choice and its effects on three aspects of education: school governance and organization, school-level achievement, and inequality in achievement and track placement/course-taking. My research questions reflect three primary issues in the school choice debate: the effects of choice on school organizational characteristics and school achievement, the effects of choice on student-level achievement and track placement and inequality in achievement and tracking, and the effects of choice on school-level diversity. This project will address the following questions:

1. Does choice affect the organization of schools? Do the changes in school organization purportedly driven by choice affect overall levels of achievement? If so, how?

2. Are poor and minority choice students disadvantaged in terms of achievement and track placement and/or advanced course-taking within choice schools? If so, how?

3. Is public choice associated with increased racial and economic diversity? Does this mediate the effect of choice on track placement? If so, does this effect vary by race and class group?

DEFINING CHOICE

Opting out of public schools and choosing a non-public alternative has always been an option for parents who had the financial means to send their children to private school. In the current climate, "choice" can be defined as selecting a private school in lieu of public one, choosing to attend a charter school, selecting a public magnet school, or choosing to homeschool. All of these options have found support among some segment of the population. Moreover, No Child Left Behind makes provisions for many of these schooling options. Many school districts, including Milwaukee, Washington DC, and Cleveland have developed voucher plans that distribute money or waive tuition altogether for disadvantaged parents, allowing them to send their children to private schools. No Child Left Behind also supports the growth of charter schools. Charter schools are publicly funded schools that operate semi-independently from the state/ district's regulatory agencies and codes. A charter school's curriculum may be premised on anything ranging from cultural identity to specialization in a particular academic area, but the idea underlying charter schools is that they will be more autonomous and innovative and therefore more effective than regular public schools. Charter schools are unique because they are not beholden to the rules and regulations that, according to some, burden regular public schools (Fuller 2002). Magnet schools also typically draw students in based on some form of specialized or innovative curriculum, but these schools were created in an attempt to hold on to diminishing numbers of White students who were fleeing court-mandated desegregation decrees in urban metropolitan areas.

For the purpose of the dissertation, I define school choice as enrollment at a magnet school, a Catholic or non-Catholic private school, or any other public school of

choice. Because I am focusing on the effects of choice on school organization, and
school governance, I exclude homeschoolers from my analysis of school choice and
achievement.

THEORETICAL FRAMEWORKS

I use two competing theoretical frameworks to explain the relationship between
choice, organization, tracking, and achievement: a market model favored by economists
and conflict model rooted in sociological traditions. Market models argue that allowing
parents to choose schools would improve achievement by creating a clientele for schools.
If schools do not perform well, that is, meet the standards and expectations of the parents
and students they serve, parents and students can leave the school and choose another.
Without a clientele, poorly performing schools would be forced to close. Within this
framework, Chubb and Moe contend that *organization* is the specific mechanism driving
achievement. By school organization, the authors are referring to the internal operations
of schools or the *process* through which schools produce desired outcomes (Chubb and
Moe 1990). Highly organized schools, they note, possess the following characteristics: a
large percentage of students in the academic track, high academic expectations for
students, efficacious teachers, strong and highly motivated principals, principals who
have autonomy and power over school policy, fair and effective disciplinary practices,
more academically oriented school goals, etc. In sum, the authors argue that choice
creates a *market* for schools. Since schools have to compete for students, choice will
force schools to organize more effectively, and in turn, improve the achievement of
students. The threat of closing provides sufficient incentive to perform well.

(Insert Figure 1.1 here)

The conflict model as I frame it here is rooted in the broader sociological tradition of class and status group conflict; it situates school choice within a broader political context. This tradition is especially prevalent in the sociology of education. I draw from several variants within the conflict framework. According to this body of literature, education is a socially valued resource. Groups at the high end of the social hierarchy view education as vital to the maintenance of their privilege while groups at the low end of the social hierarchy view education as an essential vehicle for social mobility. In general, conflict theories argue that high status groups see the educational gains of low status groups as a threat to their wealth and/or dominance. In an effort to secure their status, high status groups attempt to limit or control low status access to education. Thus, racial/ethnic groups and/or class groups are constantly engaged in conflict (hence the label) over issues such as access to education (who has it and the extent of it), the form and content of programs to be taught, (Anderson 1986; Collins 1980; Reese 1986; Tyack 1974; Wrigley 1982), etc.

I use the conflict perspective to help explain the relationship between choice and achievement. As I frame it, the conflict model charges that choice will not improve achievement, especially for poor and minority students. I argue that public choice options are associated with increased racial and economic diversity in public schools of choice at the building level. Middle and upper-class White parents, equally fearful of their children losing their privileged position within schools and of their children being exposed to students of a different cultural and economic milieu, limit the access of poor and minority students to advanced programs *within* choice schools (Wells, Holme, & Vasudeva 2002; Oakes and Wells 1996; Wells and Serna 1996). Consequently, poor and

minority students entering choice schools (in this case public schools of choice) are deprived of access to the very programs that would benefit their development most.

Increased diversity in public schools of choice can be attributed to two primary sources. On the one hand, "controlled" choice programs, in many instances, are instituted for the purposes of creating racial diversity. Rather than adhering to more controversial race-based student assignment plans, districts set out to achieve racial balance by allowing parents and students to choose schools, then managing or "controlling" the programs, for example, by limiting transfers that would result in racial imbalance or increased segregation (Henig 1996; Wells and Crain 2005). On the other hand, open enrollment choice options that allow students to "openly" choose schools lead to increased diversity as poor and minority students are attracted to higher quality schools typically in Whiter, more affluent areas (Lankford and Wyckoff 2005). In any case, I argue that increased diversity promotes closure. In other words, although public choice facilitates race and class-based *integration at the building level*, it facilitates *segregation at the classroom level* (Mickelson & Heath 1999). Advantaged parents push to restrict the access of poor and minority students to college-prep classes, AP classes, etc. Without access to the kinds of programs that produce high levels of achievement, the achievement gap between low and high SES students and White and minority students is not likely to dissipate. Thus, choice schooling, especially public choice, may exacerbate the very forms of inequality it was designed to attenuate.

While racial and economic diversity mediate academic disadvantage for poor and minority students in public schools of choice, the story in private schools is less clear. Little research has directly compared Catholic and non-Catholic private schools.

Research on Catholic schools suggests that they have high levels of achievement and reduce race and class-based gaps in achievement and course-taking (Bryk, Lee and Holland 1993; Coleman, Hoffer, Kilgore 1982; Coleman and Hoffer 1987; Lee et al 1998). However, this evidence also suggests non-Catholic private schools do not have this leveling effect. This research will investigate these phenomena further, and in doing so, draw rare comparisons between Catholic and non-Catholic private schools.

(Insert Figure 1.2 here)

Aside from the tension generated by questions surrounding the validity of each theoretical model (i.e. does choice improve achievement, etc.), a second source of tension between the two theoretical frameworks centers around a common paradox in educational research – the tension between "excellence", that is, the degree to which schools improve overall achievement, versus "equity", or the degree to which schools reduce inequality between students. Market models explicitly address and focus on the notion that choice should improve the mean level of school achievement. These arguments are clearly oriented toward understanding and reducing inequalities *between schools*. However, market models are less clear about whether or how choice affects inequality between students within schools of choice. Chubb and Moe do make clear that organized schools are more likely to place a larger percentage of students in the academic track. One take-away from this argument is that choice schools might reduce inequality in track placement, and in turn, reduce inequality in achievement. Thus, it appears that market proponents might argue that the rising tide created by the storm of choice reform will lift *all* boats.

My conceptualization of the conflict model of choice schooling does make not specific predictions regarding the effect of choice on excellence. Choice may improve overall school achievement as the market model suggests. However, my conceptualization of the conflict model unequivocally asserts that choice will increase inequality between students *within schools*. This line of reasoning mirrors Gamoran's (1992) argument against tracking. According to Gamoran, tracking does not increase mean achievement (excellence) in schools, but it does lead to increased variation in achievement between students in the high and low tracks (equity). Choice may operate in a similar manner. Consequently, the conflict model adds a caveat to the market model – choice may increase excellence, however, it achieves this end at the expense of increased inequality. In other words, the storm generated by choice reform may or may not create a rising tide, but either way the storm is likely to sink some boats while pushing others to shore. This theme will be addressed throughout the dissertation.

THE IMPORTANCE OF STUDYING SCHOOL CHOICE

This project is important for a number of reasons. First, this project will contribute to the literature on school choice because it attempts to understand the mechanisms that shape achievement levels in choice programs and the process by which these mechanisms influence achievement. Although a reasonable amount of research has assessed whether or not choice schools increase achievement (Martinez, Godwin, and Kemerer 1996; Schneider, Marschall, and Teske 2000; Witte 1996), little if any research has examined *how* choice influences achievement. This dissertation intends to fill this gap by examining how choice affects the inner workings of schools and how these mechanisms affect achievement. Second, because minority and poor families are more

likely to attend failing high poverty schools and also more likely to participate in publicly funded choice programs and utilize them as a means of escaping failing high poverty schools (Schneider, Schiller and Coleman 1996; Wells 1996), understanding the extent to which choice eliminates or reifies inequality has important implications for developing policies aimed at reducing race-based educational inequality. If choice is to be a panacea for failing American schools, then it must benefit all students, not merely a select few. Third, since No Child Left Behind makes provisions for public as well as private sector choice options, this project also has implications for understanding the utility of public choice options compared to their private choice counterparts.

ORGANIZATION OF THE DISSERTATION

Chapters Two and Three: Theory, Data, and Methods

I begin this dissertation with a discussion of the theoretical foundations and empirical background on school choice. Chapter 2 details the theoretical and empirical literature that influenced my research questions and hypotheses. Chapter 3 describes the data and statistical methods I use to address my research questions.

Chapters Four, Five, and Six: Empirical Analyses

Chapter Four is the first of three empirical chapters. In it, I address the salience of public and private choice to school-level organization and school-level achievement gain. Here I test the assertion set forth by market proponents that choice schools are more organized than regular public schools. I devise an index of school organization based on the work of Chubb and Moe. I then conduct analyses to determine if choice affects school-level organization, and if school organization in turn, affects school-level achievement. The results indicate that public choice does little to enhance school

organization while Catholic and non-catholic private schools did quite well in this regard. However, organization has no significant effect on school-level achievement. Furthermore, once organization is accounted for, Catholic schools have higher achievment gains than regular public schools *and* non-Catholic private schools.

In Chapter Five I address the effects of choice on student-level achievement and track placement. Here, I examine the effects of choice on race and SES-based differences in achievement and track placement. Although Chapter Four examines the effects of public and private choice on *school*-level organization and achievement and thereby addresses the *excellence* issue, Chapter Five focuses on race and class-based *equity* at the student-level. The results show that that there is a larger SES gap in math achievement in public schools of choice and private schools. However, track placement and course-taking do not mediate this effect. Rather, there appears to be a SES smaller gap in track placement/advanced-course-taking in private schools.

The goal of Chapter Six is to adjudicate between the two theoretical models I use to frame my argument. In this chapter, I predict that racial and SES diversity <u>mediate</u> the effect of choice on track placement and achievement. I examine the extent to which public choice facilitates race and class-based diversity, and subsequently, how choice and diversity affect the track placement of students from different racial and class backgrounds. I show that public choice options have little or no direct effect on achievement as market models would predict. Rather, public choice is associated with increased school-level racial and economic diversity, increasing the chances of being in the academic track for White and high SES students while decreasing the chances of

being in the academic track for Black, Latino, and low SES students. As expected, the higher a student's track placement, the higher their achievement.

SUMMARY

This dissertation examines the effects of school choice on school-level organization and achievement and on race and SES-based inequality in achievement and track placement/course-taking. Though economically based market models contend that choice will improve overall achievement and ameliorate race and SES-based disparities in achievement, I argue that choice may intensify already existing inequalities. Specifically, I contend that choice, especially public choice options like those seen in recent policy initiatives like No Child Left Behind that allow students attending poor, failing schools the option to choose a different public school, may not deliver on its promise of reducing disparities in achievement that plague poor and minority students. Rather, choice may widen the gap in achievement through differential track and course placements. Throughout the dissertation I explore the utility of choice and the implications it has for improving American education.

CHAPTER TWO

MARKET SOLUTIONS WITH CONFLICT CONSEQUENCES

HISTORICAL AND THEORETICAL BACKGROUND

A Short History of School Choice Reform

Historically, control over education and the options available to schoolchildren has been an invariably potent issue in the US. Parents and students typically sought some voice in the form and shape of their children's education. This issue has been complicated further by the heterogeneous nature of the American public. Social divisions between the wealthy and the poor, Blacks and Whites, and immigrants and natives have always influenced the direction of educational reform in the US. Each group has attempted to influence the tide of reform in a way that maximizes their benefit. Revisionist historians (Bowles & Gintis 1976; Tyack 1974) contend that elites were at the forefront of education reform, promoting the reforms that would serve their interests best. According to Tyack (1974), nineteenth and early 20th century elites were convinced that the immigrant poor were "unfit to manage their own educational affairs" and instead needed a professional and bureaucratic elite to govern schools for them. Tyack also notes that elites were especially critical of the neighborhood (i.e. ethnic) politics that influenced school organization and worked diligently to remove control of education from the hands of ward politicians. Ironically, in an effort to make schooling more rational, less political, and less bureaucratic, elites instituted reforms that created more bureaucracy and more inequality.

Other historians of education place working class or ethnic minority groups at the center of dissatisfaction with the school system (Anderson 1988; Reese 1986). These

groups were particularly concerned about their children having access to the forms of education that would provide opportunities for upward mobility. For instance, Anderson (1988) argues that African-Americans in the post-Civil War South tried and often successfully fought off attempts by Northern philanthropists to turn black high schools and colleges into institutions for third-rate vocational and industrial training. According to Anderson, many Black parents held high aspirations for their children which were not in any way consistent with the opportunities that a mediocre vocational education would grant access to. Similarly, Collins (1979) notes that ethnic minority groups resented the attempts of WASPs to inculcate their children. Rather, these groups desired schooling that they could control. Collins argues that the politically decentralized nature of American government made it easy for immigrant groups to create their own schools. Since there was and still is no central authority governing the US educational system, groups did not have very far to go to establish the kinds of schooling they wanted. Because authority was generally vested at the local level, immigrant and ethnic minority groups could merely petition their local leaders in order to create new schools. Interestingly, despite massive changes in educational system over the past 50 years, concerns over control have not abated. The same issues that were important in the early years of school reform - politics, bureaucracy, and parental control – remain relevant today.

While conflict between groups over education has always been an issue in the US, those who study school choice trace the beginnings of the movement to Milton Friedman's discussion of school vouchers in 1962's *Capitalism and Freedom*. *Capitalism and Freedom* first introduced the notion of applying the market metaphor to

American schools. Friedman (1962) was one of the first advocates of modern-day school choice when he fashioned early ideas for a voucher system. According to Friedman, though nationalized or government controlled schooling was necessary for a productive and stable society, the state had a monopoly over schools, and Friedman argued that competition was vital to "protect the interests of parents and students" (p. 93). Friedman reasoned that a voucher system where parents were given the cost equal to a public school education if they opted to send their children to private schools would promote competition, the "injection" of which, he adds, "would promote a healthy variety of schools" (p. 93). Thus, a market approach to education would not only better meet the demands of parents and students, but it would improve the educational system as a whole.

By the 1970s, liberals, concerned with providing a system of quality education for low-income youth had begun to consider the merits of school vouchers, and were clearly oriented more toward the re-distributory potential of a voucher plan (Henig 1994). Yet, despite early support from both sides of the political spectrum, voucher plans failed to find a concrete place in public policy until the 1990s.   The earliest experimentation with choice occurred at Alum Rock, CA in 1972. Some of the Alum Rock schools tried a "voucher-like system" where parents were able to choose the programs within schools that varied their curriculum objectives and classroom organization. Free transportation was provided to children who attended schools outside their neighborhood. However, although Alum Rock did increase the choices available to parents, the program was criticized because it did not fulfill the requirements of a true voucher system or a competitive market system (Bridge 1978).

In the 1970s, choice emerged as a response to the massive levels of white flight that occurred in urban metropolitan areas after Supreme Court mandated desegregation rulings. The 1954 *Brown* decision was followed by a number of subsequent decrees (including Green v. New Kent County ruling in 1968 where the Court ruled that desegregation must be achieved with respect to facilities, staff, faculty, transportation, etc. and Swann v. Charlotte-Mecklenburg ruling in 1971, which struck down racially neutral student assignment plans that produced segregation and legalized busing as means of achieving racial balance) that made finding voluntary means of desegregating more attractive. It was in this climate that the first magnet schools and programs were established. Fashioned as a tool to curtail "white flight", magnet school programs as we know them were introduced in the 1970s as a means of reducing racial and economic segregation while also strengthening the academic programs of struggling schools by introducing novel curricula and instructional approaches (Blank, Levine, & Steel 1996). By providing schools containing high concentrations of minority students with additional resources to create innovative programs, magnet schools were intended to compel parents to voluntarily enroll their children in schools in ways that would improve racial balance (Henig 1994). The federal government began lending support to magnet schools in the form of the Emergency School Assistance Act (ESAA) and the Magnet Schools Assistance Program (MSAP), both of which were created to assist school districts in their efforts to desegregate. Magnet schools are typically found in urban school districts with large minority populations (Black, Levin, & Steel 1996; NCES 2003b). Although these programs were initially created to attract non-minorities to racially and economically isolated schools, some argue that they lead to the re-segregation of students on the basis

of race at the building and at classroom level (Henig 1994; 1996; Saporito 2003; Wells, Holme, and Vasudeva 2002).

More recently, school choice reform has shifted to the development and expansion of charter schools. Charter schools are publicly funded schools that exist semi-independently from the bureaucratic reach of local school boards and state regulatory agencies. Persons interested in forming a charter school (parents, teachers, corporate firms, activists, etc.) can petition the local school board who then grants a charter to the petitioners. Charter schools are managed by a "local board", generally composed of parents or teachers, although charter schools are also sometimes managed by firms or companies that specialize in the management of schools.

Charter schools can trace their origins to a number of movements and perspectives. Charter schools, or the idea behind them, first materialized in the alternative/community schooling movement of the 1960s which saw those on the political left, especially urban Blacks, at the forefront of efforts to transfer control of schools to communities. Charter schools can also trace their genesis to the smaller government perspective and the standards initiatives of the New Right of the 1980s and 1990s, which reflected a growing commitment to decentralization, accountability, and autonomy. Ideally, charter schools satiate those on both sides of the political spectrum – empowering those who seek community control while also being more accountable for the achievement of students, at least in theory (Fuller 2000; Wells 2002). However, some argue the growth of charter schools does not necessarily reflect any direct support for charter schools, but more aptly reflects greater levels of opposition to their voucher

counterparts. Consequently, many see the growth of charter schools as a way to forestall the more controversial and less palatable voucher system (Dillon 2005b).

Institutional Causes, Market Solutions

Though introduced by Milton Friedman, the notion of applying market principles to American education was revived with the publication of Chubb and Moe's (1990) *Politics, Markets, and Schools*. Broadly, Chubb and Moe contend that public schools do not belong to parents and students.   These critics charge that the problem facing American schools is that they are both too democratic and too bureaucratic. They argue that under a system of democratic control, public schools are governed by a diffuse constituency, including a democratically elected school board where the interests of parents and students bear little importance. Public school constituencies are often heterogeneous, and because of this, schools often try to do too many things for too many people. Thus, the set of goals that public schools are expected to pursue is overwhelming. Schools are asked to move in multiple directions at once – they are expected to educate children about sex, counsel the emotionally and psychologically impaired, socialize immigrants, conduct vocational training, mainstream handicapped children, teach English as a second language, etc.). Chubb and Moe note that as a result of the heterogeneity of the public and the necessity of political compromise, school goals tend to be diluted and weak. Furthermore, democratic control allows groups who stand to lose from institutional change (teachers, superintendents, school boards themselves) too much control.

At the same time, Chubb and Moe argue that schools are too bureaucratic. Democratic control creates rules and regulations that constrain the governance of schools.

Personnel decisions are hampered by formal rules designed and imposed by higher levels of government. Personnel decisions are influenced by tenure laws, certification requirements, and protections ratified by public officials to shield teachers from political pressure. According to Chubb and Moe, "teachers' unions demand that economic rewards be governed by formal rules (specifying who gets what and when) and removes as many employee incentives as possible from the discretion of management" (p. 48). Principals are prevented from staffing their organization and setting policy that best suits their particular organization. Principals are precluded from obtaining the teachers who possess specific qualifications and are unable to dispose of those teachers who lack the qualities vital for student success. Therefore Chubb and Moe conclude that the bureaucracy of personnel tends to ensure that public schools will lack the proper mix and balance of talents on which effective education depends.

However, in a market system, Chubb and Moe contend that principals can recruit the kinds of teachers he or she wants and needs most. Democratic institutions prevail in the public sector, and personnel decisions are, in turn, highly bureaucratized. Principals are merely bureaucrats with supervisory responsibility. The truly important decisions have been made by another set of bureaucrats at higher levels in the administrative hierarchy. Moreover, principals are bound by all sorts of rules and regulations that dictate aspects of internal school structure. In the private sector, schools are free of the contraints that limit their public school counterparts.

Given these constraints, Chubb and Moe maintain that the only way to "free" American schools from their constraints is to shift to a system of choice where markets and not bureaucracy and democracy create a clientele for schools. The rationale is that if

schools have to compete for students and parents they will better serve them. Chubb and

Moe maintain that bureaucracy invalidates the most basic requirements of effective

organization. It imposes goals, structures, and requirements and dictates the duties of

principals and teachers. The key to effective education rests with granting schools

autonomy, which Chubb and Moe note is critical to unleashing the productive potential

already present in schools and their personnel. The more autonomous individual schools

are and the less they are subject to bureaucratic constraint, the more likely they are to

become effective organizations. The institutional perspective here suggests that among

other things, America's traditional institutions of democratic control cannot be relied on

to solve schools' bureaucracy problem. In a market system, the authority to make

educational choices is transferred to those most immediately involved. Schools compete

for the support of parents and students, and parents and students are free to choose

schools. The system is built around competition, decentralization, and choice. Within

this framework, traditional reforms, including more money and more control will not

produce results. According to Chubb and Moe, the former is inappropriate because

research suggests that resources do not matter much. The latter is problematic because

control (bureaucracy) is the problem itself. Schools need visionaries – the likes of Joe

Clark and Marva Collins – people who challenged educational bureaucracy and

established norms and transformed their beleaguered schools and communities.

Consequently, Chubb and More contend that autonomy, markets, and visionary leaders

will solve America's school "crisis".

Ironically, Chubb and Moe's solution to the crisis created by too much democracy

and bureaucracy is for schools to become even more democratic. If parents were able to

choose their schools and have a voice in the way their schools were run, then the "crisis"

would dissipate. Schools would be forced to compete for students and parents. Such

competition would make schools more attentive to the needs of parents and students,

because if schools failed to meet these expectations, parents and students could simply

choose another school that would satisfy their needs. Therefore according to Chubb and

More, free and open markets resolve the problems created by bureaucracy and politics. A

"laissez faire" policy works for the educational system as well as for the economy. Less

interference and more choice generates a more effective system of education.

Class and Status Conflict Explanations

Chubb and Moe conclude that giving parents and students the freedom to choose

schools will solve many of the problems plaguing American schools. However, while

Chubb and Moe argue that the heterogeneous nature of the American demographic

creates some of the problems associated with schools, they overestimate the extent to

which choice can solve the heterogeneity problem. Racial, ethnic, and class

heterogeneity have historically created problems for the American education system.

According to Collins (1979), high-status class and ethnic groups (typically, wealthy,

White, Anglo-Saxon Protestants) have historically attempted to maintain their privilege

by using the educational system to limit the access of lower-status competitors (Southern,

Central, and Eastern European immigrants, Catholics in the 19th and early 20th centuries,

Blacks and other racial minorities in the 20th century) to high-status professions. By

limiting access to schooling or controlling the types of education lower-status groups

received, higher status groups were able to maintain a monopoly over various

occupations that brought them prestige.

Historians of education have documented the numerous ways in which political and business elites have attempted to control the schooling of lower-status groups. Class imposition arguments maintain that education is "best understood as an institution which serves to perpetuate the social relationships of economic life" (Bowles & Gintis 1976). According to these arguments, the structure of the educational experience is suited to nurturing attitudes and behavior that are consistent with participation in the labor force. Education trains people to relate "properly" to their eventual standing in the hierarchy of authority in the economic sphere. Furthermore, education works to reproduce the social structure by providing low status citizens the kinds of schooling that will solidify their position at the bottom of the social hierarchy. Typically, this kind of schooling has involved varying levels of vocational and technical training. Within this framework, persons from high-status backgrounds receive academic training that will prepare them for positions of power and leadership. In addition, class imposition arguments also maintain that non-elites passively accept the forms of education made available to them by ruling elites. Class conflict arguments make similar claims, although they diverge regarding the passivity of non-elites. That is, although class conflict arguments typically challenge the notion that non-elites wage little resistance against elite efforts to control their schooling, they generally agree with the assertion that elites sought/seek to limit non-elite access to academic and liberal arts training (Anderson 1986; Wrigley 1982; Tyack 1974).

Collins also notes that because of the decentralized nature of the American political system, lower-status groups were able to create their own schools and were able to at least partially circumvent some of barriers erected by high-status groups. In

response, high-status groups inflate the credentials necessary to obtain prestigious jobs. High-status groups constantly "ratchet up" the requirements for jobs they want to monopolize, either by increasing the number of years of education needed to qualify for certain jobs or by creating licensing requirements for various fields like medicine and law. Collins' theory of unending closure and inflation demonstrates that high-status groups continuously erect barriers to keep low status groups at the bottom of the social hierarchy. When reform appears to propel lower-status groups over one barrier, higher status groups find a way to establish a new one. In Collins' depiction of struggle over resources and prestige, there is no finality – the battle over education and status never ends.

Status conflict may be useful in explaining the outcomes of students in public schools of choice. First, for some, the decision to attend a school of choice may be symbolic of intentions to preserve or enhance one's status. Attending a school with a good academic record is certainly more likely to increase the chances of gaining admission to a better college or a getting a good job for any individual or group. However, whereas it was once thought that choice schools were the refuge of middle and upper-class White parents fleeing increasing numbers of poor and minority students, many poor and minority students are beginning to take advantage of the opportunities offered to attend schools outside of their regular attendance zones as well (Plank, Schiller, Schneider, & Coleman 1993). But as this trend increases, middle and upper-class non-minority students may still benefit if they are in more prestigious programs or tracks in choice schools while poor and minority students are relegated to lower-level tracks. In other words, high-status parents may create closure by limiting the access of

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low status groups to high-level tracks within schools. Rather than leave the schools in their neighborhoods for private schools, high-status parents may resort to: 1) managing which students get admitted to the choice schools their children attend 2) dominating exclusive programs within the choice schools their children currently attend.

Class and Status Conflict Within Schools: Tracking

Status and class competition may manifest itself in public schools in the way schools admit students to schools as well as the way schools permit access to the various programs within schools. In an effort to maintain control over superior forms of education, schools and the high-status parents behind the scenes may close off superior programs to lower-status students within schools. Here, I focus on one method of closure – academic tracking. This method of closure is particularly relevant for choice schooling. Critics contend choice shifts disparities that once existed between schools, race and class inequality especially, into within school-disparities. Thus, for critics of choice, although choice may reduce race and class-based segregation at the building level, choice increases race and class-based segregation at the classroom level. In this section, I review the literature on tracking and link it to the school choice debate.

Tracking refers to the practice of sorting students into ability groups for the purpose of instruction (Hallinan 1994). As an organizational practice, tracking is intended to facilitate learning. However, there is a great deal of research which suggests that tracking may benefit the learning of some students while it hinders the learning of others. In addition, sorting students into homogeneous ability groups often results in curricular differentiation, or variation in the material and content students are exposed to. Oakes (1985) studied 25 California schools and found stark differences between students

enrolled in high-track classes and students enrolled in low-track classes. According to Oakes, students in high track classes are exposed to "high-status knowledge" – they learn critical thinking and problem solving skills, they study classical works of literature, they learn high level math skills, etc. In contrast, students in low track classes are exposed to wholly different content and types of instruction. Whereas students in high track classes read classical works of literature and wrote analytical essays, Oakes found that low track classes focused on basic literacy skills. Writing assignments were short and simple, and learning only required basic memory or comprehension tasks. Topics in high-track math classes included mathematical ideas, while low-track math classes centered on simple computational skills and arithmetic facts. Oakes notes the content of low-track classes limits the mobility low-track students, since the omission of information leaves low-track students without an adequate academic base to enter the high-track.

Thus, tracking may benefit the achievement of students in the highest tracks, but it generally comes at the expense of low achievement for those in the low track. According to Gamoran (1992), a tracking policy that encourages strict differentiation simultaneously produces very high scores among those students in the highest track and low test scores among those students in the lowest tracks. In other words, tracking increases the distribution of scores within schools, especially compared to schools that do not practice tracking or practice it less stringently. In schools with less rigid tracking structures, the distribution of scores is *truncated* and not as wide as schools with more rigid structures. Gamoran argues that because of this, "grouping and tracking rarely add to overall achievement in a school, but they often contribute to inequality" (p. 13). For example, the success of Catholic schools in minimizing the achievement gap

between White students and minority students and between high SES and low SES students has been attributed to the fact that Catholic schools tend not to practice tracking (Coleman & Hoffer 1987; Bryk, Lee, & Holland 1993). All students are enrolled in a similar academic program, and this reduces any differences in instruction or curriculum that might contribute to variation in achievement levels.

If tracking does not fulfill the goal of facilitating learning as some claim (Hallinan 1994), then what purpose does tracking serve? Oakes and her co-authors argue that tracking performs status maintenance functions. They maintain that the structure of tracking is embedded in cultural and political contexts of schools and communities. Tracking may be used as a political tool to preserve the power and privilege of high-status groups. High-status parents recognize that the practice of tracking can ensure that their privilege is passed on to their children. These parents typically demand more differentiation within schools and fervently reject the attempts of school officials to detrack or offer advanced curriculum to all students.

According to Wells and Oakes (1996), high-status parents are often quite concerned that their children learn content and receive instruction that other children will not get. High-status parents want their children to have something "extra", and frequently pressure administrators to maintain separate and unequal classes. Moreover, Oakes notes that high SES parents, who possess more political and social capital than their economically disadvantaged counterparts, are able to secure high track placements for their children even when their child's merit warrant lower-level placements (Oakes 1994; Oakes and Guiton 1995). Oakes' work consistently points out that cognitive ability plays a minor role in track placement; she concludes that other non-cognitive factors, like

race, have a larger effect on track placement. Indeed, Oakes argues that there is consistent evidence documenting the discriminatory low placement of minority students. Low-track classes are typically populated by poor and minority students, while high track classes are dominated by middle and upper SES White students. However, scholars disagree about the causes of race and class disparities in track placement. Some scholars discount the direct effects of race and class on tracking, and instead attribute track position to pre-existing skill differences (Pallas et al 1994). Still, despite debate regarding the causes of the relationship between race/class and low track position, the findings of previous research suggests that the phenomenon warrants further research.

Given the increased likelihood that poor and minority students will end up in the lowest tracks, the relevant question is to what extent school choice resolves this problem. Some research notes that poor and minority students are more likely to utilize choice when the option is available to them (Lee, Croniger, & Smith 1996; Schneider, Schiller, & Coleman 1993). Indeed, voucher programs are geared specifically toward helping poor and minority parents send their children to private schools. At the same time, other research notes that efforts to ameliorate one form of racially-based educational inequality, for instance segregation at the building level, do not translate into integration, and hence, heterogeneous ability grouping at the classroom level (Henig 1994; Mickelson & Heath 1999). If this is the case, then the implementation of choice as a means to better educate poor and minority students may be an exercise in futility.

EMPIRICAL REVIEW

The literature on school choice is both scattered and contradictory. With very few exceptions, research on school choice has eluded publication in the most prestigious

journals. At this point, the majority of the research on school choice has been published in edited volumes rather than peer reviewed journals. Moreover, the body of literature accommodating school choice research is multidisciplinary, emanating from education researchers, political scientists, economists, in addition to sociologists. At the same time, the evidence regarding the effects of school choice is incongruent. While some empirical research extols the benefits of choice, other research finds fatal flaws in school choice policy. Research investigating school choice has typically focused on which parents and students choose schools, the effects of choice on racial and economic segregation in schools, and the effects of choice on achievement. In this section, I will review this evidence in order to better understand the ways in which school choice affects educational inequality. First, I review the literature on the effects of choice on school organization. Next, I will examine the effects of school organization on achievement, followed by a broad review of the empirical literature by addressing research that examines achievement in choice schools. I conclude with a review of literature investigating parental satisfaction and segregation in choice schools.

The Effects of Choice on School Organization

Part of the aim of school choice reform is to improve schools by changing the way they are organized. Market models of education predict that choice and competition will force schools to organize more effectively. Effectively organized schools, in turn, are likely to display higher aggregate levels of achievement. However, while literature assessing the effects of school organization on achievement is relatively abundant, little research has examined the effects of choice on school organization and governance specifically. The extant literature assessing external influences on school organization

typically includes factors like SES and racial composition of the student body, and for the most part, fails to conceptualize choice as a determinant of school organization. However, research on the effectiveness of Catholic schools seems to suggest that a primary reason for Catholic school success has to do with the social organization of Catholic schools, which in part, can be attributed to the shared values of Catholic school parents, students, and teachers. Coleman and Hoffer (1987) claim that parents choose Catholic schools in order to be a part of a community of persons who share similar values, and that the increased social interaction that ensues from these shared values reinforce structures that support academic achievement among students. Goldring et al. (1997) argue that even if parents choose particular schools because they share non-religious values with other parents, for instance a commitment to the academic values of the schools, this kind of communal organization positively influences teacher efficacy and staff morale.

According to Chubb and Moe's market framework, Catholic schools are more successful than public schools for two reasons: competition and politics. First, because students choose to attend Catholic schools, Catholic schools must compete with public as well as other private schools, therefore the quality of their product must exceed that of their competitors. Second, because they are not subject to the heterogeneous political influences that plague public schools, Catholic schools administrators have more freedom to set policy and hire personnel. Moreover, in hiring personnel, Catholic school principals are able to hire the most motivated teachers who provide the best fit for their schools. Consequently, teacher efficacy is much higher and teachers are more likely to embrace extended roles, including helping students outside regular class time. As Bryk,

Lee, & Holland note (1993), the bureaucratization of schooling has promoted the breakdown of commitment among teachers, and since Catholic schools are not subject to these bureaucratic demands, Catholic schools are more likely to exact the kind of labor from teachers that leads to high achievement among students.

Chubb and Moe examine the effects of sector on school organization and find that private control of schools promotes effective organization of schools more than democratic control does. They found that sector had a positive influence on school organization. According to the market model, private schools are relatively autonomous and are free of the bureaucratic constraints hampering public schools. Bureaucracy is the result of democratic control, and when markets, not politics, control schools, schools are free to do as they please. Chubb and Moe do note that in special circumstances, for example, non-urban schools systems with good parents and students, autonomy can be high in the public sector. However, they contend that "institutions of democratic control", i.e. public schools, inexorably discourage autonomy.

With the exception of Chubb and Moe, the few studies that have examined the effects of choice on school governance and organization have not capitalized on the existence of large-scale quantitative data sets, but have instead relied on qualitative data to understand these dynamics. Although some research suggests that charter school principals and teachers do have a great deal of autonomy in setting school and classroom policy (Yancey 2002; Zernicke 2002), it is not clear that this autonomy contributed to enhanced achievement on the part of students. In fact, although the charter school Zernicke studied was comprised of middle and upper-class White students and exhibited high levels of autonomy and curricular innovation, overall achievement in the school was

lower than levels in the local middle school. Brown, Henig, Lacireno-Paquet, and Holyoke (2004) find that charter schools run by education management organizations tend to be larger in size and are less likely to exhibit decision making control at the school level. Hence, it is not clear that changes in school organization created by choice will lead to increased student achievement.

In their study of a newly developed California charter school, Wells, Holme, and Vasuveda (2002) document how choice might affect academic organization. They find that choice and decentralization may exacerbate policies like tracking that divide students and lead to unequal levels of achievement within schools. Their findings reflect two issues: how the impetus compelling choice and decentralization are frequently the result of status conflict motives and how these motives influence academic organization within schools. Located in a wealthy area, the charter school Wells and her colleagues studied was once a public high school. However, enrollment in the school declined and the school teetered on the verge of closing because many of the students in the school's zone attended private schools. Because of the declining enrollments, the district began a transfer program that brought minority students to the school, which also helped alleviate crowding in inner-city schools. The original impetus for the charter was to attract local families back to the school and give local parents control of the school. Although committed to diversity, local parents wanted to attract a "different type" of transfer student to the school. After the transformation to a charter school, the White upper-class parents were very clear that did not want the same type of minority students that populated the school prior to the transformation (generally poorer, unmotivated). They used targeted methods to attract middle-class minority students to the new school. The

school established relationships with higher status feeder schools in more middle- and upper-class Black areas of the city. Students from these feeder schools were typically given first priority in admissions along with students graduating from local middle schools. One parent quipped that one of the reasons they elected to become a charter school was because as a charter, they could accept students by application only.

In addition to limiting the entrance of low status students to their school, Wells et al. also found that there was tension between the minority transfer parents and the community parents when school officials initiated attempts to narrow the achievement gaps between community and transfer students. When school administrators attempted to shrink the disparity by reducing curricular differentiation (limiting the number of AP and honors courses, changing the way students were admitted to these courses, providing tutoring and academic support) and expanding academic opportunities by offering challenging courses to all students, community parents were adamantly opposed to these efforts. Many parents criticized these reforms as having an adverse impact on high-achieving (typically white and wealthy) students, despite the fact that the majority of students at the school were minority (65%). This case study illustrates how the conflicting goals of some choice programs, promoting integration while enhancing achievement, often clash. In this case, efforts to integrate schools at the building level did not necessarily translate into integration at the classroom level.

While choice programs may, in theory, be expected to reduce racial and socioeconomic segregation and improve achievement, choice may not give poor and minority students access to the programs within schools that would reduce educational inequality. Although choice may enhance some aspects of school organization, choice

may intensify exclusionary policies like tracking that benefit a select few at the expense of those in need of help most. In an effort to monopolize the privileged positions within schools, parents may help to create schools-within-schools that isolate academically needy students from gifted students. Thus, it appears that reformers cannot rely on market models alone to remedy school organization and improve achievement. Academic differentiation, i.e. tracking, appears to be an important factor in understanding the effects of choice on achievement.

The Effects of School Organization on Achievement

According to the market model, competition and choice should increase the achievement of schools by improving school organization. By school organization, I mean the demographic features and internal operations of schools or "the process through which schools produce desired outcomes".   With the exception of Coleman's (1966) classic study of school effects on achievement, most research on the effects of school organization can be found in the effective schools literature. The effective schools literature was a diversion from the earlier school effects research shaped by Coleman. Coleman focused on inputs (e.g. school resources) and outputs (achievement) rather than the processes that produce these outcomes (Lee, Bryk, & Smith 1993). Moreover, Coleman's work implied that the reorganization of schools would have negligible effects on student achievement (Rowan, Bossert, & Dwyer 1983).

However, research from the effective schools literature suggest otherwise. Effective school research emerged in the 1980s, and generally attempts to identify the various bureaucratic elements of schools that improve performance. Broadly, effective school research identifies the following components of school organization as shaping

achievement: a clear mission, quality of the staff, leadership of the principal, expectations for students, academic and curricula organization, etc. Other research, like the work of Valerie Lee and Anthony Bryk on Catholic schools, focuses on the "communitarian" aspects of schools that improve performance. This includes the social relationships in schools, (among teachers and administrators and between students and teachers) that benefit the performance of students.

Previous literature suggests that Catholic school students outperform public school students and that Catholic schools do a better job of narrowing the achievement gap between socioeconomically disadvantaged and advantaged students and between Black/Latino and White students (Coleman & Hoffer 1987; Bryk, Lee, & Holland 1993) because of the organizational characteristics of these schools. The literature generally offers two primary explanations for the public school/Catholic school difference. First, Catholic schools have more academic requirements and do not engage in tracking to the degree that comprehensive public schools do. Consequently, students in Catholic schools are required to undertake more rigorous academic coursework. Moreover, students in Catholic schools, in spite of differences in "ability", have similar academic experiences. Second, researchers argue that Catholic schools comprise value communities, where families share similar values about schooling and child rearing. The communal organization of Catholic schools (structure of social relations) enhances teacher efficacy and satisfaction and facilitates interaction between parents which in turn lead to higher levels of achievement for students. Thus, at least part of the success of Catholic schools is attributed to minimal levels of tracking.

If minimal tracking contributes to higher levels of achievement in Catholic schools, what effect does tracking have when it is implemented more heavily? Gamoran (1992) argues that despite arguments to the contrary, tracking does not contribute to higher levels of achievement and instead, leads to greater inequality in achievement within schools. Because students in the low track often receive inferior instruction and are exposed to less challenging content, Gamoran argues that tracking may reduce overall levels of achievement. If all students in public schools were exposed to similar kinds of material and instruction as they are in Catholic schools, then the belief is that achievement levels in public schools would more closely match those observed in Catholic schools.

Chubb and Moe identify four specific dimensions of school organization that influence the achievement of students: Personnel, goals, leadership, and practice. The first dimension, personnel, identifies the characteristics specific to teachers that affect student achievement. These characteristics include teacher quality, teacher influence and efficacy, teacher absenteeism, teacher experience, teacher collegiality, teacher professionalism, etc. The second dimension, goals, refers to the objectives schools aspire to meet. Basic literacy skills, academic excellence, human relation skills, and specific occupational skills are all goals that school may try to accomplish. Chubb and More contend that when schools have strong academic missions and make academic excellence their goal, they are more likely to have higher levels of achievement. Thus, setting high expectations for students is one way to increase achievement. The third dimension, leadership, refers to the power principals have to shape their organizations. Leadership embodies the principles of autonomy and freedom from bureaucracy that Chubb and Moe

identify as being central to the effective organization of schools. Schools in which principals have the capacity to establish school policy, have control over their school's personnel policies, and are dedicated to their jobs are more likely to exhibit higher levels of achievement.

The fourth dimension of school organization identified by Chubb and Moe, practice, involves "how programs are carried out, services provided, and children taught". Chubb and Moe add that practice includes most of the activities within a school that are directly related to education, for instance assigning homework, the enforcement of discipline, and academic tracking. Chubb and Moe find support for each of these dimensions. They find that schools with the highest achievement shared the following characteristics: teachers and principals enjoyed above average levels of influence and had higher levels of efficacy, teachers were considered excellent by their principals, principals' were motivated and dedicated to teaching, homework was regularly assigned, and discipline was strictly enforced.

While school organization has an effect on achievement, there are an additional set of factors that influence school organization itself. School size is an important organizational factor that has implications for the achievement of students (Lee, Smith & Croniger 1997). There are several consequences of increased school size, which appear to affect achievement through the effects it has on school organization. Lee, Bryk, and Smith (1993) note that while large schools may have more resources than smaller schools and may be able to offer a more differentiated curriculum, this may not necessarily benefit achievement. More differentiation in public schools is often problematic because it generally leads to more course offerings in non-academic areas. Consequently, less

advantaged students are more likely to enroll in these less demanding courses, resulting in more within-school stratification. Consistent with Weber's (1946) analysis of organizations, organizational growth also leads to increased bureaucracy – an increase in scale supposedly necessitates a hierarchical authority structure. Bureaucratization can lead to alienation and a lack of group cohesion. Smaller schools are less bureaucratic, and teachers and administrators not only have more congenial relations with one another and with students, but the reduced size also allows teachers and administrators to exercise more autonomy (Bryk, Lee, & Holland 1993; Lee, Bryk, & Smith 1993). Lee, Smith, and Croniger (1997) find that learning is greater in math and science in smaller schools. They also find that smaller schools are more equitable in terms of achievement.

Demographic characteristics, like the racial and socioeconomic composition of the school, are additional set of exogenous factors that also influence school organization. For one, increased racial and socioeconomic diversity in schools often stimulates an increase in specialized programs that isolate minority students from white students and poor students from wealthier ones. For example, desegregation plans often lead to more stringent tracking regimes in which poor and minority students are separated from more advantaged students at the classroom level, although they are integrated at the building level (Mickelson & Heath 1999). Lucas (1999) and Lucas and Berends (2002) found that even though overarching tracking programs were on the decline and course-based tracking on the rise, high levels of racial and socioeconomic diversity led to a system of "de facto tracking" - that is, more association between the level of courses (college-prep versus general) students took. In addition, Cusick (1983) and Grant (1988) found that racial diversity often leads to the increase in non-demanding curricular offerings, of

which minority students were more likely to be enrolled in. Research in the effective schools literature demonstrates that there are differences among high and low SES schools, even when both types of schools are considered effective. Hallinger and Murphy (1986) found that principals in low SES schools tend to exercise more direct control over classroom instruction and were more forceful in establishing expectations for staff and students while principals in high SES schools were less forceful and gave teachers more autonomy. In addition, Hallinger and Murphy discovered that curriculum expectations were not uniform across effective high and low SES schools. Lower SES schools focused more on basic skills and offered fewer enrichment/accelerated classes and more remedial classes than high SES schools.

Thus, the organizational characteristics of schools, including the academic organization, the organization of authority, and the organization of teachers' and students' work have a clear effect on the achievement of students. Moreover, external factors, like size and sociodemographic composition, also influence the organization of schools. Smaller schools, schools that have explicit and high expectations for students, schools with efficacious teachers and principals, and schools where principals and teachers have some control over school policy typically have higher levels of achievement than schools that do not exhibit these organizational characteristics. Moreover, schools where tracking is less heavily practiced also have higher aggregate levels of achievement. Given these findings, what effect does choice have on school organization? Does choice produce more effectively organized schools?

Choice and Achievement

How does choice effect achievement? Do some choice schools fare better in terms of achievement than others? The findings from research investigating the effects of choice on achievement are decidedly mixed. Moreover, the effect of choice on achievement is very much a function of the particular type of choice option under examination. As previously mentioned, Catholic schools are particularly successful at producing high levels of achievement and this success has in part been attributed to the academic organization of Catholic schools and the market principles embedded in private school choice.

Although less external bureaucracy and more control may to lead to higher levels of achievement in Catholic schools, this is not the case for all schools of choice. Charter schools in particular have a relatively dismal record of performance. Although they are similar to Catholic schools to the extent that they are relatively autonomous and therefore fairly independent of external bureaucratic control and also that they are often times communally organized, charter schools have not surpassed levels of achievement seen in public schools and may even perform worse than regular public schools. For example, the National Center for Education Statistics (2003a) conducted a nationwide study of 3000 charter school students and found no measurable difference in reading and math performance between 4th grade charter school and public school students of the same racial/ethnic and socioeconomic background. Wells (2002) notes that none of the methodologically sound state-level reports show significant increases in overall achievement for charter school students. Instead, Wells explains, the most consistent finding among charter schools is the lack of high academic achievement. At the same

time, some research suggests that charter schools also stratify schools along racial and ethnic lines. Cobb & Glass (1999) found that Arizona charter schools enrolling a higher numbers of ethnic minority students tended to be vocational secondary schools or "schools of last resort" for students expelled from traditional schools.

On the other hand, the only reports of success among charter schools are typically qualitative or anecdotal. Some of the evidence documents the success of the KIPP (Knowledge is Power Program) schools. Using an approach to teaching developed by three young teachers, KIPP schools are composed mostly of Latino and Black youth and have consistently outperformed other public schools serving similar low-income students (Nathan 2004). A study of California charter schools found that charter schools were producing average test scores among populations of children generally associated with low test scores (Loveless 2003). In a case study of an all Black charter school in Michigan, Yancey (2000) found that the school increased math performance dramatically over the course of 3 years (from 22% performing in the satisfactory range in 1995 to 54% in 1998). Given the contradictory results, drawing any definitive conclusions about achievement in charter schools is difficult. As one researcher noted, "Charter schools differ markedly from each other and consequently there is no single charter school effect on student achievement. From campus to campus, charter schools are so diverse it is impossible to paint a single picture of them. To precisely evaluate performance, you really need to consider the type of charter school and the characteristics of the specific charter" (Zimmer, quoted in Nathan 2004). In addition, charter school laws vary from state to state. For example, In Michigan, charter schools must make admissions by lottery. Since most charters in Michigan are in urban districts and enroll more poor and

minority students, performance is likely to be lower. On the other hand, in California, charters are allowed to select students. Moreover, California charters are typically located in small towns or suburbs, enroll fewer poor and minority students, and often require parents to contribute resources (Lewin 1999). Thus, understanding achievement in charter schools may require more complicated research designs than are currently being employed to study charter schools.

With the exception of Catholic schools, the only choice schools that seem to have any consistent positive effect on achievement are magnet schools. Gamoran (1996) found that magnet schools were more effective than regular public schools at raising the proficiency of students in science, reading, and social studies. Martinez et al. (1996) found that participating in multilingual theme magnet programs in the San Antonio school system increased math and reading course of enrollees over the course of a single school year. Blank (1990) found that magnet schools had significantly higher test scores than non-magnet schools.

The most significant model of magnet school achievement is in East Harlem, NY. Developed in 1973, the program was established in response to the district's dismal performance. Only 16% of the students were performing at grade level and dropout rates were high. In the early 1970s, the district was ranked last among all of New York City's school districts. By 1982, East Harlem ranked 15th in New York City in reading scores. By 1987, 63% of students in the district were reading at grade level. This success is attributed to the implementation of a choice program and innovative programs and initiatives within "alternative" schools. These schools were organized around specialized curricular and pedagogical themes, including biomedical studies, environmental studies,

bilingual arts, the performing arts, and the humanities. The new alternative schools also had smaller enrollments than regular neighborhood schools. In these alternative schools, parents, teachers, and principals were given more control. Principals of alternative schools had more control over staffing and often bypassed the seniority system in order to recruit young, energetic teachers. The success of the East Harlem schools has also been attributed to a technique known as "creative noncompliance", or the circumvention of established bureaucratic rules, for instance, like bypassing the seniority system to hire teachers, in order to run the schools.   Eventually, as parents became aware of the differences between the alternative and neighborhood schools in the East Harlem district, the district decided to provide all parents with the option to choose their child's school (Fliegel 1993; Kirp 1992; Schneider, Marschall, and Teske 2000).

Schneider, Marschall, and Teske (2000) studied the effects of school choice options on achievement in two New York City districts, including the renowned East Harlem district, as well as and two suburban New Jersey districts. The authors compared achievement in two choice districts in New York City - the East Harlem district which has expanded choice, and another district in Lower Manhattan where choice was more limited. They found that schools in the East Harlem district performed significantly better than schools in the rest of the city and better than the Lower Manhattan district with fewer choice options. The authors also analyzed the expansion of choice overtime in Montclair and Morristown, NJ schools and found that math and reading scores increased as choice options increased.

On the other hand, there is very little evidence in support of increased achievement in voucher programs. This is partly a result of the limited extent of research

examining voucher programs. The most prolific researcher on voucher programs, John Witte, studies the effects of various choice programs in Milwaukee. He has found no evidence to suggest that vouchers enhance achievement. For example, Witte (1996) found that low-income students participating in the Milwaukee voucher program scored only a few points better in reading but a few points worse in math than a group of low-income Milwaukee Public School students in 1991. By 1993, low-income Milwaukee voucher students scored a few points higher in math but a few points lower in reading than a comparison group of low-income Milwaukee Public School students. Altogether, these results suggest that achievement differences between low-income Milwaukee Public School students and low-income students attending private schools under the voucher plan are negligible. However, in a separate study of the Milwaukee voucher program, Beales and Wahl (1995) found that low-income voucher students do better than a similar group of Milwaukee Public School students. Similarly, Hill (1995) found that SAT scores of African American students in a New York City Catholic school voucher program were higher than African Americans enrolled in public schools.

Overall, it is difficult to draw any definitive conclusions about the effects of choice on achievement. Too little research has been conducted on charter schools to determine if and how charter schools affect achievement. Furthermore, although it appears that magnet schools have a positive affect on achievement, it is unclear whether the increased achievement of students in magnet schools comes at the expense of low achievement of students not enrolled in magnet programs, either between programs within schools (enrollment in magnet program in X school versus enrollment in the regular academic program at school X) or between schools within districts (magnet

schools versus non-magnet schools). In other words, high achievement in magnet

programs/schools may occur as the result of a "creaming effect" that segregates the

highest achieving students in the best programs or schools. Within magnet schools that

have regular programs in addition to the magnet programs, students in regular school

programs and classes may not benefit from the kinds of teaching and innovation that

occur in magnet programs and classes. Magnet programs, and choice schools more

generally, may become sorting machines where less privileged students are unable to

gain access to the programs that will increase their achievement. Thus, although it may

appear that magnet programs increase achievement, the real question asks whether

magnet schools/programs, and choice programs in general, do so at the expense of high

inequality. This dissertation seeks to address this question.

Segregation and Choice

A segment of the research on racial and economic segregation indicates that

choice may reduce segregation, or at least preclude it (Archbald 2004; Schneider, Teske,

& Marschall 2000). Many researchers suggest that choice programs curb segregation

because they are highly regulated (Henig 1990; 1994; 1996; Schneider, Teske, &

Marschall 2000). Some types of choice programs were instituted for the specific purpose

of minimizing racial segregation, and to this end, many are successful. In highly

regulated programs and systems, school racial balance is closely monitored. Henig (1996)

notes that in Montgomery County, Maryland, school officials have been able to

successfully use magnet schools in order to promote integration by rejecting 15% of all

transfer requests to magnet schools when such transfers would exacerbate racial

imbalance. Similarly, in some systems, when parents fail to select "opposite-race"

schools in sufficient numbers they are reassigned to those schools (Rossell 1995).

Decisions to regulate choice in the aforementioned fashion often make school systems

vulnerable to attack. In 1998, the magnet school program in Charlotte, NC came under

attack for trying to ensure racial balance. A White parent sued Charlotte-Mecklenburg

schools, claiming that his daughter's 14th Amendment rights had been violated because

she was denied a spot in a magnet program in favor of a Black student with a higher

lottery number (*Capacchione v. Charlotte-Mecklenburg*). Since the Charlotte-

Mecklenburg school system had instituted the magnet program in response to opposition

against other methods of reducing segregation, the U.S. Court of Appeals for the 4th

Circuit found the race-conscious admissions policy was lawful since the district was

under desegregation orders by the court when the policy was instituted.

However, although choice and integration may not be incompatible, they are

certainly not harmonious (Henig 1996). Other choice research suggests race and SES are

central factors in deciding which choice school to attend. For example, past research

suggests that when choosing schools, White parents select schools that have lower

populations of poor and minority students and that Black parents select schools with

higher proportions of minority students and in lower-income neighborhoods (Henig 1996;

Saporito & Lareau 1999). Although market-based choice theories assume that parents

are rational actors and base their choice decisions on academic criteria alone (Goldring,

Hawley, Saffold, Smrekar 1997), other research reveals that a number of non-academic

characteristics play a role in school choice, including racial makeup of student

population, safety in the school, etc (Henig 1996; Saporito and Lareau 1999; Saporito

2003). Moreover, providing a choice option does not guarantee that White parents will

stay in a school system. Shifting to a choice plan from a neighborhood assignment plan sometimes has the same effect as the desegregation rulings of earlier eras – White exodus.   A case from Des Moines, Iowa demonstrates how voluntary choice with few restrictions may exacerbate segregation. After the state of Iowa allowed students to attend school in any district in the state, White students in Des Moines began leaving city schools for suburban ones en masse, prompting the school board to reject later transfer requests made by White students (Wilkerson 1992).

Overall though, it appears that the reason why much of the research suggests that choice programs reduce segregation is because many of these programs are highly regulated choice programs. Segregation is only abated when parental choice is supplemented by strict management by school officials. Thus, racial segregation is only attenuated because school officials in choice programs, typically magnet programs, vigilantly regulate school racial composition. Magnet schools and other schools of choice may therefore present a problem for market solutions to inequality. Although the schools were designed to ameliorate one form of inequality, if parent and student consumers are allowed to choose freely, inequality may be enhanced rather than reduced. However, while some research suggests that choice may exacerbate racial and or economic segregation, it is important to keep in my that unfettered choice may compel poor and minority parents and students seeking better quality schooling to seek out more affluent, and in turn, more diverse school settings. Nevertheless, integration at the *building level* may not translate into integration at the *classroom level*. While choice may lead to increased diversity at the building level, tracking and academic differentiation

may impede any benefits choice may impart. Hence, diversity may further mediate the effect of choice on achievement. This is an important consideration.

General Methodological Concerns in School Choice Research

Many critics of school choice charge that research showing increased achievement among choice schools is the result of methodological deficiencies. Henig (1994) notes that a few of the possible explanations for improvement include the following: 1) self-selection processes that bring motivated students to choice schools who would succeed anywhere (also known as selection bias) 2) independent changes in the demographic composition of the student body 3) the continuation of trends already underway before the policy was put in place 4) appropriate control groups (Henig 1994; Powers & Cookson 1999). In addition, Henig (1994) notes that another methodological issue facing school choice research is that major assessments of educational choice rely on school and not classroom-level data. Henig adds that this is problematic in light of indications that magnet schools may serve the integration interests of the state while also buffering White students from the full impact of racial integration by segregating White students in subprograms or tracks.

Selection bias has proven to be a major issue for researchers studying school choice. Selection bias is particularly interesting because it may account for wholly contradictory results in choice research – why some choice schools enhance achievement and why others fail to do so. Those choice schools that attract high achieving students from high-status backgrounds are more likely to have higher overall test scores. At the same time, choice schools whose student base is composed of students from low-income backgrounds may be have lower aggregate test scores, not because the schools are

inadequate but rather because students may have fewer of the home resources necessary to succeed academically. In light of the dazzling performance of Catholic schools and the disappointing performance of charter schools and voucher programs, selection bias at the high and low ends of the SES continuum may account for this discrepancy. Given that charter schools tend to attract significant numbers of minority and inner-city students and Catholic schools tend to attract parents who can afford to pay tuition, selection bias may contribute to these results (NCES 2003a).

However, research suggests that even low-income parents in choice programs are generally more educated than non-choosers (Powers and Cookson 1999). Despite the lack of economic resources, poor choice students may be more motivated than low-income students in public schools. Furthermore, despite the fact that they are publicly funded, charter schools students apply and are selected to attend. Other choice schools are also selective. Kirp (1992) attributes part of the success of the East Harlem magnet system to the fact that school administrators "seek out students they think will succeed in their schools" (p. 127). Catholic schools also screen students seeking admission, and their success with poor and minority students may be a result of this screening process and not anything inherent to the organization of Catholic schools.

This literature suggests that accounting for a student's inclination or propensity to attend a public school of choice or private school is an important consideration in school choice research. If the same characteristics that lead to higher achievement influence students' propensity to attend a high school of choice rather than a regular comprehensive high school then it is important to account for the proclivity to choose.

SUMMARY, RESEARCH QUESTIONS, AND HYPOTHESES

In sum, school choice advocates contend that increased competition will force schools and school systems to better serve parents and students. Chubb & Moe maintain that competition and choice require that schools be "effectively" organized. Accordingly, schools are more effective when school administrators are less subject to external bureaucratic dictates and when staff have the autonomy to establish internal school policy that is consistent with each school's unique needs. Consequently, choice and competition should increase autonomy at the school level. Schools in systems where they must compete to please parents and students will be more effective, e.g. produce higher levels of achievement.

However, although school choice has been conceived as a way to increase achievement and reduce educational inequality, some evidence suggests that school choice does neither. On the other hand, choice may be exacerbating inequality. High-status groups may use choice as a way to maintain their privilege. Tracking systems within choice schools may limit the access of poor and minority students to superior academic programs. Although there may be racial and socioeconomic integration at the building level, segregation at the classroom level may restrict the learning opportunities of poor and minority students.

My research questions reflect three primary issues in the school choice debate, both of which focus on the causal effects of choice on school organizational issues and the effects of those organizational issues on achievement. Below, I summarize the specific research questions I address in this study and the predictions regarding those questions made by the competing theoretical frameworks I use.

Research Question 1: Choice, Organization, and Achievement - To what degree does choice affect school organization, and in turn, school-level achievement?

According to the market model proposed by Chubb and Moe, school choice will lead to more effectively organized schools, which will increase the achievement of students. However, given that many choice programs are geared toward giving students options among public schools, a related question is whether or not the market model of increased organizational efficiency applies to public school programs of choice. Patterns in public schools of choice may not fit the assumptions made by market model of school choice. Public schools are still *public* schools, and are therefore less autonomous than private schools. Consequently, market models may not apply to public school choice options. If this is the case, then we cannot expect that public schools of choice will not be any more organized or effective than regular public schools.

Research Question 2: Choice and Equity - To what degree does choice affect race and class-based inequality in achievement and advanced course-taking?

Market models predict that choice will increase the overall achievement of schools. In doing so, market models implicitly assume that choice will reduce inequality between students within schools. Conflict models, on the other hand, claim that choice may increase achievement disparities between students within schools. According to this model, choice will not improve achievement, primarily because poor and minority students are disadvantaged in terms of advanced course-taking in schools of choice.

Research Question 3: Market versus Conflict - Which model best explains the relationship between choice and achievement?

Research Question 3a: Is choice associated with an increased likelihood of being in the academic track? (Market)

Research Question 3b: Are public schools of choice more racially and socioeconomically diverse that regular public schools? (Conflict)

Research Question 3c: Do racial and economic diversity mediate the relationship between choice and track placement? Does the effect of diversity on track placement vary by race and class? (Conflict)

Three specific predictions arise from this set of questions. First, market models predict that choice should make schools more organized. Part of being more organized is increasing the size of the academic track. Hence market models predict that choice should increase the likelihood of being in the academic track for the "average" student (Question 3a). However, conflict models contend that choice will increase the racial and economic diversity of schools (Question 3b), but the diversity created by choice at the building level will lead to increased racial and economic segregation at the classroom level. Thus, the diversity engendered by choice is likely to result in the sorting of White and high SES students into the academic track in public schools of choice, while poor and minority students, who lack the social, economic, and cultural capital to compete with their more advantaged counterparts in racially and economically diverse settings, will be consigned to non-academic curricular concentrations (Question 3c). I not only test the specific predictions made by each theoretical framework, but I also compare the overall fit of each model to the data at hand. In doing so, I ask: Which model explains the relationship between choice and achievement best – the market model or the conflict model?

In the pages that follow, I use data from a large-scale, nationally representative data set to address these questions.

CHAPTER THREE

DATA AND METHODS

INTRODUCTION AND REVIEW OF RESEARCH QUESTIONS

The primary goal of this study is to understand how school choice affects two fundamental aspects of schooling: school organization and achievement. In addition to these basic goals, this study also attempts to understand how school choice affects the pervasive achievement gap between White and minority students and between economically advantaged and disadvantaged students. The results of the research presented here have wide-ranging policy implications, at both the local and federal levels. School choice, public choice options as well as private sector variants like school vouchers, have been conceived and favored by various levels of government as a means of enhancing achievement overall as well as a means to reduce race and class-based gaps in achievement. Various urban localities including parts of New York City (the famous East Harlem district as well as the surrounding suburbs of Morristown and Montclair, NJ), Washington, D.C, St. Louis, MO, and even some states (Minnesota, Massachusetts) had implemented some form of public school choice prior to the passage of No Child Left Behind legislation. Similarly, in an attempt to resolve achievement disparities between disadvantaged students and their more advantaged counterparts, states like Minnesota and Ohio had passed private school voucher plans prior to No Child Left Behind. More recently, No Child Left Behind attempts to minimize the achievement gap by allowing students attending Title I schools (economically disadvantaged schools) to choose a school when their school fails to meet established achievement standards. To

that degree, understanding the extent to which choice actually does increase overall achievement and narrow the achievement gap is of vital interest to policy makers.

Consequently, this dissertation seeks to address three basic questions:

- Does school choice affect the organization of schools? Does school organization affect school-level gains in achievement?

- Does choice affect student-level race and class-based inequality in achievement and tracking?

- Do racial and economic diversity mediate the effect of choice on achievement? Moreover, do market models or status conflict models more aptly explain the achievement of poor and minority students in choice schools? (See Figure 3.1)

(Insert Figure 3.1 about here)

These questions necessitate two distinct levels of analysis – a school-level analysis as well as a student-level analysis. In Chapter Four, I use school level data to assess the effects of school choice on school organization and school-level achievement gains using Ordinary Least Squares Regression (OLS). In Chapter Five, my analyses address the effects of school-level characteristics on student-level outcomes. Specifically, I look at the effects of school choice on the relationship between race/SES and achievement and between race/SES and track placement and advanced course-taking. In Chapter Six, I use school and student-level data to adjudicate between the two theoretical models I use to frame my argument and to test my hypotheses regarding the mechanisms that link school choice and achievement.

In this chapter, I outline the data, methods, and procedures I use to examine these research questions. The chapter proceeds in the following manner. First I address the data set I use and its suitability to address the questions at hand. Then I discuss the measures I use to operationalize the concepts and outcomes of interest. I discuss the strategy I use to conduct each analysis in each individual chapter.

DATA

Overview of Data Set

I use data from the base year (2002) and first follow-up (2004) of the Educational Longitudinal Study (ELS) to assess school governance policies, performance of students in choice schools, and the tracking structure of choice and non-choice schools. ELS is a longitudinal study conducted under the auspices of the National Center of Education Statistics that monitors a large, nationally representative sample of high school students beginning in 10th grade. ELS is the fourth major secondary school longitudinal study sponsored by NCES, and reflects the research objectives and designs of the three studies that preceded it, including National Longitudinal Study of the High School Class of 1972 (NLS), High School and Beyond (HS&B), and National Educational Longitudinal Study of 1988 (NELS:88). Begun in 2002, the study will eventually assess these students as adults. Because access to critical items is restricted in ELS, including the identification of schools as public choice, magnet, or charter, I use the restricted version of ELS.

ELS is a suitable data set for a number of reasons. First, ELS contains school-level as well as student-level data that permit me to analyze the effects of school-level indicators like choice on the relationship between student-level covariates and outcomes (i.e. race/SES-achievement, race/SES-tracking). Second, ELS was designed with issues

of school choice in mind. Consequently, ELS differentiates between various types of schools as well as different variations of choice options including comprehensive public high schools, public schools of choice, public magnet schools, public magnet schools with a specialized academic theme, charter schools, and various forms of Catholic schools (parish school, diocesan school, religious order, etc). Third, ELS contains a series of questions related to school organization and governance policies. These questions assess the various organizational traits and characteristics of schools. These survey questions make it possible to test Chubb & Moe's hypotheses regarding choice, school organization, and achievement. Finally, although NELS has both a larger sample size and more questions relating to school governance policies, I use ELS because it the most up-to-date. Since major developments in school choice policy have arisen in the last 5 to 10 years, ELS captures these developments better than NELS.

Sample Design of ELS

ELS used a two-stage stratified sampling procedure to generate a suitable sample for study. The target population for ELS consisted of 10th grade students in US high schools that were enrolled in regular public schools, charter schools, and Catholic and other private schools.

The first stage of selection involved the identification of schools eligible for study. Those schools which did not have 10th grade were eliminated from the pool of participants. Also excluded from the sample were Bureau of Indian Affairs schools, special education schools for the handicapped (the blind, deaf, etc.), schools that were detention centers or correctional facilities, area vocational schools not enrolling students directly, and Department of Defense schools located outside the United States. Of the

1,221 schools identified as eligible, 752 agreed to participate. Because non-public

schools are typically scarcer than public schools, these schools (specifically, Catholic and

other private schools) were oversampled in order to increase their representation in the

final sample.

The second-stage of sample stratification involved the selection of students.

Approximately 26 students were randomly selected from each participating school. In

order to ensure that a sufficient number of minority students were included in the sample,

Latino and Asian students were oversampled so that each ethnic subpopulation had a

minimum sample size of 1,356 participants. Students with physical and mental

disabilities and students with limited English language proficiency were deemed

ineligible and were not included in the final sample. The final sample consisted of

15,632 students.

Final Sample

Though ELS includes 752 school and 15, 632 students, I limit my sample to

include 639 schools and approximately 8251 students. My sample excludes multiple

schools and students for a number of reasons.   First, I restrict my analyses to include

schools that can be classified as public comprehensive high schools, magnet high schools

(subcategorized as magnet with or without a theme), other public schools of choice,

Catholic schools (subcategorized as Catholic diocesan, Catholic parish, Catholic religious

order or Catholic independent), and private schools with or without a religious affiliation.

Additional school categorizations in ELS include: year round school, area vocational

school/center, full-time/other technical/vocational school, boarding school, Indian

reservation, school, military academy, alternative/dropout prevention/continuation

school, charter school. All schools falling outside of the comprehensive/magnet/ other

public choice/Catholic/private classification scheme were excluded from the sample. [1]

However, administrators were allowed to mark multiple options when attempting

to classify their schools in ELS. This resulted in a number of cross-classifications. For

example, an administrator may have responded that their school was a public

comprehensive high school as well as a magnet school. In the event of multiple

classification, I classify schools identified in any way as a choice school as a choice

school rather than as a public comprehensive high school.

Data cleaning at the individual level also resulted in the elimination of cases.

Outliers, or data points with extremely low or high values, can influence statistical

estimates. I limit the effect of *severe* outliers for achievement gain only, and eliminate

data points more than 3 standard deviations from mean. This resulted in the exclusion of

30 students (.22% of the original population) whose 12th grade math achievement score

was 20.69 points lower than their 10th grade math score, and 27 students (.20% of the

original sample) whose 12th grade math achievement score was 31.22 points higher than

their 10th grade achievement score. In addition, I excluded all students that did not

classify as White, Black, Latino, or Asian/Pacific Islander (i.e. multiracial and Native

American students).[2] Finally, I excluded students that did not have complete data on all

variables of interests (see next section).

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[1] I exclude schools 25 schools that either do not have information on school type or were classified as
simply as a high school served by an area or regional technical or vocational school.
[2] Multiracial and Native American students were present in small numbers in ELS and made making cross-
racial comparisons with other groups difficult. Consequently, I exclude them from my final sample.

METHODS

Missing Data

Missing data are often a problem in statistical analysis. Given the large scale and longitudinal nature of ELS, missing data can become a particularly troubling concern. Respondents may choose to forgo survey questions for a number of reasons. On the one hand, respondents may simply overlook questions. On the other hand, missing information may have more nebulous origins. Respondents may fail to answer survey questions because their responses might reveal sensitive information (i.e. income) or may reflect negatively on them. For example, persons with very high or very low earnings may be reluctant to report their income on a survey. Similarly, school administrators may be unwilling to report incidences of violence in their school because it may suggest that they are performing poorly.

Regardless of the reasons respondents have for failing to answer questions, the missing information creates a number of dilemmas for researchers. Missing information often leads to biased statistical coefficients. NCES does attempt to resolve some of these problems by imputing data for some questions that may have missing information, especially those items containing important demographic information on respondents. For example, when student reports of their race/ethnicity is missing, NCES will impute this data from another source, including other questionnaire items (parental race/ethnicity as listed on parental questionnaire), student race as listed on school roster, from surname, etc. Nevertheless, demographic information does not entail the full extent of missing data in any survey. Therefore, additional measures must be sought out to account for missing information.

The most common solution to the missing data problem is *listwise deletion*.

Listwise deletion involves excluding all cases that contain missing data. Therefore, only

cases with complete data are included in the analysis. However, listwise deletion is

oftentimes an inadequate solution to a missing data problem. First, listwise deletion can

dramatically reduce sample size, in turn, reducing the power of an analysis. Second, if

the data are not missing completely at random, that is, if missing values depend on a

particular variable, listwise deletion can produce biased results (Allison 2002). For

instance, if low-income respondents are less likely to report their income, then any

analyses assessing the effects of SES will bias the effect of SES on the outcome, since

low income persons were excluded from the analyses.

Other solutions to the missing data problem involve some form of imputation or

replacement of the missing value. *Single imputation* methods fill-in a single value for

each missing value. One method of single imputation, mean substitution, involves

substituting the mean of a variable for any missing value on that variable. This method,

however, has been widely criticized. Since missing values are taken from the center of

the distribution, mean substitution underestimates sample variance (Little & Rubin 2002;

Schafer 1997). *Single regression imputation* uses multivariate regression procedures to

predict missing values. This method involves regressing the variable with missing data

on all other independent variables in the analysis. The estimated equation is then used to

generate predicted values for each of the cases with missing data. Also known as

conditional mean substitution, this method tends to underestimate standard errors and

overestimate test statistics (Allison 2002). Another problem with single imputation

procedures is that they lack a random component. That is, since regression on X is used

to impute values of Y, the values generated from the imputation fall directly on the regression line. This inflates the correlation between the two variables, leading to an overestimation of their relationship (Allison 2002).

Multiple imputation (MI), on the other hand, is a type of data imputation procedure that produces more than one value for any single missing value. Multiple imputation introduces a random component into the imputation model by creating multiple data sets with a different plausible value which replace each missing value in each of the newly generated data sets. Each data set, with the missing data replaced, is analyzed as a complete data set. Generally, anywhere from three to ten imputations are necessary to yield valid estimates and standard errors. However, the efficiency of the estimates produced are in part based on the rate of missingness and the number of data sets that are generated. The larger the degree of missing data, the larger the number of imputations required to produce reliable estimates (Schafer 1997). The ultimate goal is to produce a set of m imputed data sets, each of which is filled-in with values that are essentially random draws from a distribution of plausible missing values. Rather than treat a single data set as a "true" estimates of missing values, multiple imputation creates data sets which contain a different plausible value for each missing value (Peugh and Enders 2004). Producing multiple data sets rather than a single data set is also important because if a singly imputed data set is treated as if it were" real" data, the standard error estimates will be too low and the resulting test statistics (p-values) will be too high. The solution to this problem is to generate multiple imputed data sets (Allison 2002).

Multiple imputation is complicated by the introduction of a random component into the imputation process that reflects uncertainty about the missing data (Honaker,

King, and Blackwell 2007). The random component is generated by making a serious of

draws from the residual distribution of each imputed value. Those random numbers are

then added to the imputed values (Allison 2002). The variation created by the

introduction of a random component helps adjust the standard error upward. An example

from Allison (2002) provides a useful illustration of this concept. Suppose you are

estimating the correlation between X and Y in a sample of 10, 000 cases where 5,000 of

the cases on X are set to missing. The correlation between X and Y in the complete data

set is .30. You can impute values for X by regressing X on Y for the cases with complete

data and then use the resulting regression equation to generate predicted values for the

cases with missing X values. Substituting the predicted values from regressing X on Y,

the correlation between X and Y is .42, not .30 as in the original sample without missing

data.

   According to Allison, the correlation is overestimated because the imputed valued

of X for the 5,000 cases with missing data is a perfect linear function of Y, leading to the

inflation of the correlation between X and Y. The correlation is simply the covariance

divided by the product of the standard deviation of X and Y. The regression imputation

yields unbiased estimates of the covariance, but the standard deviation of X is

underestimated.   Allison notes that bias can be corrected by taking random draws from

the residual distribution of X and then adding these random numbers to the predicted

values of X. In this example, the residual distribution of X has a mean of 0 and a

standard deviation of .9525 (estimated from the listwise deleted least-squares regression).

For case i, u_i is a random draw from the standard normal distribution and $\hat{x}_i$ is the

predicted value from the regression of X on Y. The adjusted imputed value is $\tilde{x}_i = \hat{x}_i$

+ .9525u$_i$. For all observations where X is missing, $\tilde{x}_i$ is substituted and then the correlation is computed. In Allison's data set of 10,000 cases, the correlation using the adjusted formula for the imputed values is .316, only slightly higher than the .30 correlation when no cases are missing.

I use both listwise deletion and multiple imputation procedures to account for missing data. I use listwise deletion to exclude students with missing data at the student-level while I use multiple imputation procedures at the school-level to preserve the number of schools available for analysis. Missing values proved to be particularly problematic at the school-level. A large portion of the missing data in the set of variables used here occurred on the school organization index. The school organization index is composed of eighteen variables. As many as 207 of the 637 schools ELS deemed eligible for this study had missing values on any one of these variables. This problem can, in part, be attributed to the sheer number of variables included in the index. Consequently, if listwise deletion were used to account for missing data at the school-level, this would result in the exclusion of an extremely high number of schools. Therefore, I use listwise deletion to eliminate cases with missing data at the student-level but employ multiple imputation procedures at the school-level to preserve the number of schools in the analysis.

Table 3.1 shows the degree of missing information on the school organization variable by school type. Magnet schools appear to have the most missing data. Approximately 48% of magnet schools have missing values on the school organization index. Non-Catholic private schools (26%) and other public schools of choice (27%) have the least amount of missing values on the school organization index.

(Insert Table 3.1 here)

I use two different methods to "fill-in" missing data at the school-level. The first

method, known as Full Information Maximum Likelihood (FIML), is a maximum

likelihood procedure that is used by a variety of statistical procedures to obtain estimates

of model parameters. In general, the basic goal of maximum likelihood estimation is to

identify the population parameter values most likely to have produced a particular sample

of data. This is an iterative process where the model fitting program "tries out" different

values for the parameter of interest (regression coefficients) en route to identifying the

values most likely to have produced the sample data. The fit of the data to a particular set

of parameter values is gauged by a log-likelihood value that quantifies the relative

probability of a particular sample (Peugh & Enders 2004). ML estimation is suitable to

account for missing data because a researcher need not discard cases with missing data

(listwise deletion) or fix the data (impute missing values) before running the analysis

since estimation is based on all available data points (Peugh and Enders 2004). The

inclusion of cases with partial data contributes to the estimation of all parameters.

Although missing values are not imputed during this process, the partial data do imply

probable values for the missing scores via correlations among the variables (Peugh and

Enders 2004). Thus, when using an ML procedure there is no need to impute data

outside the program one is using to conduct statistical tests.

In addition to FIML, I also use multiple imputation procedures to account for

missing data. Specifically, I use AMELIA II, a freeware MI program created by

Honaker, King, & Blackwell (2007). AMELIA uses bootstrapping-based EM algorithm

to impute missing data. EM - short for Expectation-Maximization – is an iterative

procedure that repeatedly cycles between two steps, as the name implies, an Expectation

or E step and a Maximization or M step. The Expectation step is simply a regression

imputation of the missing values. In this step, the missing values are replaced with

predicted scores from a series of regression equations where each missing variable is

regressed on the remaining observed variables. The Maximization step, however, is more

complicated. In this step, estimates of the means and covariance matrix are obtained as if

there were no missing data using the statistics calculated in the previous E step. The

resulting covariance matrix and regression coefficients from the M step are used to derive

new estimates of the missing values at the next E step and the process begins again. The

M step uses the same computational methods as Maximum Likelihood methods, that is

by maximizing the expected log-likelihood (Little and Rubin 2002). The program iterates

through the Expectation and Maximization steps until the estimates stabilize.

However, the formulas for variances and covariances are adjusted for any terms

that include missing data in the Maximization step (hence the label Maximization).

These terms correspond to the residual variances and covariances, based on the

regression used in the E step. The addition of the residual term corrects for the

underestimation of the variance that occurs with other imputation procedures (i.e.

regression imputation). Allison (2002) gives the following example. Suppose for

observation i, X_3 was imputed using X_1 and X_2. Wherever the conventional variance

formula $(xi_3)^2$ would have been used, $(xi_3)^2 + s^2_{3\cdot21,}$ where $s^2_{3\cdot21}$ is the residual variance

regressing X_3 on X_1 and X_2. This, in addition to the random component and the

generation of more than one imputed data set, adjusts for bias in variance estimates in

multiple imputation procedures.

I use multiple missing data methods instead of one for practical reasons. First, FIML is performed within one's data analysis program. More specifically, if FIML is available, it is through the program one uses to analyze their data. Hierarchical Linear Modeling, the program I use for testing the effects of school-level variables on student-level outcomes, does not have FIML capabilities while Mplus, the program I use to test my Structural Equation models is equipped with FIML capabilities. Though I could use MI procedures for both programs, FIML has a number of advantages. Not only is it computationally simpler than MI, but it also computes direct parameter and standard error estimates and therefore does not require additional calculations to obtain these estimates after the analysis, as is the case with MI. Consequently, I use the two methods instead of one for purely practical reasons.

One issue that is relevant to both types of missing data methods concerns whether or not the data is missing at random (MAR). One assumption of all missing data techniques is that the probability of having data missing on the variable of interest is not systematically related to the value of that variable or any other variable in the data set (Allison 2002; Little and Rubin 1987). The former part of this assumption is impossible to test – there is know way to know if missing data on Y for example are related to the values of Y because the data is missing. However, it is possible to tell if the data missing on Y are related to other variables in the data set. A rudimentary (though crude) way to test this assumption is by creating a variable that signifies "missingness" on Y, then code the newly generated variable in such a way that denotes whether the data is present or missing. I generated a missingness variable for the school organization composite, coded it 0 if the data were present and 1 if the data were missing, then conducted a simple

logistic regression. If missingness were significantly related to any of the variables in the data set and therefore were not missing at random, the coefficients from the logistic regression would be significant. However, if missingness were random, there would be no systematic relationship between missingness on the school organization variable and the other variables in the data set (Cheung, personal correspondence 2007). Table 3.2 displays the results of the analysis for missingness.

(Insert Table 3.2 here)

The results of the MAR analysis suggest that missing data on the school organization variable appears to be associated with only one of the nine school-level characteristics included in the analysis. The percentage of minority students appears to be related to the absence of data on school organization. However, since the percentage of minority students is the only school-level characteristic related to absence of data on school organization, and since the imputation methods I use are relatively robust even when the missing data mechanism is ignored, I do not model the missing data mechanism as part of the parameter estimation process (Allison 2002).

Measures

Here I provide a broad introduction to the measures I use in each analysis.

Dependent Variables

My analyses include four primary dependent variables – school organization and school-level achievement (Chapter Four), student-level achievement and student-level tracking (Chapters Five and Six). I describe these variables and how I operationalize them in the sections that follow.

School Organization. Because of the centrality of Chubb and Moe's (1990) work to the

school choice debate, the variables I choose to represent school organization stem from

their well-known work. Chubb and Moe identify four specific dimensions of school

organization that influence the achievement of students: Leadership (the authority and

autonomy of principals), personnel (characteristics specific to teachers that affect student

achievement), practice (how programs are carried out, services provided, and children

taught, i.e. the activities in a school related to education), and goals (the objectives

schools aspire to meet). They develop an index of school organization based on these

four dimensions using indicators obtained from High School and Beyond (See Table 3.3).

I use a corresponding set of measures from ELS to approximate the indicators used by

Chubb and Moe (See Table 3.4). I create a school organization index by standardizing

each of the measures, averaging them, then standardizing the average. The mean of this

scale is set to zero and standard deviation is set to one (See Table 3.5).

<center>(Insert Table 3.3 about here)</center>

<center>(Insert Table 3.4 about here)</center>

<center>(Insert Table 3.5 about here)</center>

Achievement. In this project, I conceptualize achievement as having three separate and

distinct measurement components. These components reflect: 1) the temporal nature of

achievement 2) the technical aspects of the test used to gauge achievement 3) the

particular subject matter (math, reading, social studies, science, etc.) covered by the

achievement assessment. I discuss each of these components in more detail below.

The first component of measuring achievement involves the longitudinal or

temporal aspect of achievement. By longitudinal/temporal I mean the need to control for

prior achievement in any assessment of achievement. There has been some methodological debate regarding the best way to account for prior achievement. Typically, achievement is measured in one of three ways. One way is to use an achievement score as the dependent variable while controlling for prior achievement on the right side of the equation. This method is known as the regressor method or lagged model and can be written as:

$$Y_{t2} = \alpha + \beta_1 (Y_{t1}) + \beta_2 (X_1)$$

Some argue that the regressor model is inappropriate because it increases the likelihood of making a Type II error (Allison 1990). In other words, the problem with the regressor method is it typically concludes that the treatment or independent variable has no effect, when in fact, it does. The argument here is that if the regressor method is used to estimate the difference in achievement gain between two groups with different levels of initial achievement, measurement error in Y1 will underadjust for initial differences between groups (Allison 1990; Sorenson and Morgan 2000).

A second way to measure achievement is to use a change or gain score. In this method, achievement at Time 1 is subtracted from achievement at Time 2 (T_2-T_1) and the sum is regressed on the set of independent variables. This model can be written as:

$$Y_{t2} - Y_1 = \alpha + \beta_1(X_1)$$

Change scores are considered suitable for substantive as well as methodological reasons. Some (Ballou 2002) argue that student progress as measured by gain scores is a better indicator of school quality than Time 2 score alone. For example, high scores in a wealthy school with wealthy students may reflect the advantages of student's home background and not the school's academic environment. However, a school with poor

students may have significantly lower average test scores than its wealthier counterparts, but a strong and dedicated faculty may labor to significantly improve scores from one year to the next. Thus, overall mean achievement is clouded by the influence of family background while achievements gains are considered a purer indication of a school's contribution to achievement.

However, there are two widely cited problems with the change score method. First, changes scores are considered by many to be unreliable. Allison (1990) notes that while Y_1 and Y_2 may be equally reliable, the reliability of Y_2-Y_1, expressed as

$$\frac{\rho_Y^2 - \rho_{12}}{1 - \rho_{12}}$$

where ρ_{12} is the correlation between Y1 and Y2 and ρ_Y^2 is their common reliability. If the correlation between Y1 and Y2 is positive, as it typically is, then the reliability of the change score is less than their common reliability (ρ_Y^2). For example, if ρ_Y^2=.7 and ρ_{12} =.6, the reliability of the change score is only .25. The second widely cited problem with change scores is regression toward the mean. Persons with high scores at Time 1 tend to move down while persons with lower scores at Time 1 tend to move up. Still, other methodologists warn that by excluding Time 1 score from the right-hand side of the equation, the change score method assumes that how much a student learns is independent of what they already know (Morgan and Sorenson 1999). Hence, a third way to measure achievement is to use a change score as the dependent variable while also including achievement at Time 1 as an independent variable. This model can be written as:

$$Y_2\text{-}Y_1 = \alpha + \beta_1 (Y_{t1}) + \beta_2 (X_1)$$

This method, known as the lagged gain model, is preferable to the regressor and change score method because it captures any regression toward the mean and also eschews problems associated with unreliability (Sorenson and Morgan 2000). Moreover, this method also takes into account one important concept – simply that the amount a student learns is based on how much that student already knows. While this appears to be more controversial in the sociological literature, this assumption is common in literatures examining growth rate and change over time, especially research utilizing Hierarchical Linear Modeling (HLM). In this research, initial status, or the score on a particular outcome at Time 1 is considered a meaningful predictor of growth rate (Raudenbush & Bryk 2002).

Nevertheless, despite the methodological arguments for using lagged gain scores instead of the simpler change method, both methods yield *identical* parameter estimates, with one slight difference: the coefficient for Y_1 on the right hand side of the equation in the lagged gain model is the same as Y1 in the change model *plus 1* (Sorenson and Morgan 2000).

Given the similarity in the outcome, I use the lagged gain model to measure achievement in school-level analyses and the regressor method in multi-level analyses while reporting gains in achievement in descriptive analyses. Not only is the regressor method simpler, but the lagged gain alternative proves problematic with some of the analytic techniques I use. More specifically, in analyses that use Hierarchical Linear Modeling, using a gain score as the dependent variable proved problematic when attempting to assess the degree of variation in the dependent variable that occurred across schools. The first step in an HLM analyses to determine how much variation in the

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dependent variable occurs across schools. This calculation is known as the intraclass

correlation (ICC). This is an important component of an HLM analysis. As the initial

step, calculating the ICC permits the researcher to determine if HLM is truly necessary

(Lee 2001).   However, since a gain score is the sum of two variables – Time 2 score

minus Time 1 score, the latter of which would otherwise be an independent variable –

this dramatically reduces the amount of variation that appears to occur across schools.

For example, when gain score is used as the dependent variable, it looks as though only

5% of the variation in achievement gain occurs across schools. By most standards, at

least 10% of the variation in the dependent variable needs to occur across schools in

order to justify the use of HLM (Lee 2001). On the other hand, when Time 2 score alone

is the dependent variable, 25% of the variation in achievement occurs across schools.

The latter is more than enough to justify using HLM.

The second component of measuring achievement concerns the technical aspects

and scaling methods of the actual achievement test itself. ELS includes two primary

measures of achievement – a standardized measure and an IRT measure. The

standardized measure is, according to ELS documentation, a standardized T score that

provides a *norm-referenced* measurement of achievement, or an estimate of achievement

relative to the population of 12th graders in 2004. It provides information on math

achievement compared with peers. The alternative scaling method in ELS is IRT (short

for Item Response Theory). IRT is a *criterion referenced* test that measures a students'

status in time. Though both sets of scores are designed to maximize accuracy in a limited

testing time while minimizing floor and ceiling effects, (that is, minimize the possibility

that the test cannot measure students' with very low or very high ability levels)**,** IRT

scores are useful in identifying differences among subgroups in overall levels of achievement. Moreover, IRT scores are appropriate for use in multivariate analysis and for modeling gains in achievement (NCES 2007a). Given that IRT scores are best for comparing subgroups and for use in multivariate analysis, I use math IRT scores to assess achievement.

The third measurement component of achievement involves the particular subject matter being assessed. Generally, most achievement related research assesses competence in math and/or reading and to a lesser degree acheivement in the natural sciences and history/social science. I assess math achievement for substantive as well as practical reasons. Substantively, math scores are thought to be a better indicator of the performance of schools because reading and other language skills are considered to be strongly influenced by parental SES. Since math skills are less influenced by home background than reading skills, math assessments therefore supposedly better reflect the contribution schools make to achievement. However, while substantive reasons precipitate the use of math scores, limitations in the data set make using math scores pragmatic as well. More specifically, ELS only assesses reading at one time point – that is, only during the base year and not both the base year and first follow-up. Consequently, it is impossible to control for prior achievement when reading scores are used as the primary achievement measure. With no 12th grade achievement measure available in the data set, math becomes the one and only way to examine achievement gains from 10th to 12th grade.

Given the above concerns, I use 10th and 12th grade math IRT scores to measure achievement. To obtain a mean base and first-follow up score for each school in aggregate analyses, I combine individual scores by school to generate a school score.

Track/Curriculum Concentration. I use *transcript-reported* curriculum concentration to gauge the effects of school choice on individual-level track placement.[3] ELS uses a variable developed from student course-taking patterns to gauge curriculum concentration. This variable differentiates between students whose course-taking patterns reflect a concentration in high level academic content, a concentration in a specific occupational or labor market area, a combination of academic and occupational concentrations, or some other pattern. In ELS, academic curriculum concentration is indicated by the following requirements: four credits of English, three credits of math with at least one credit higher than Algebra II, three credits of science, with at least one credit higher than biology, and three credits of social science with at least one credit in US or world history, and two credits in a single foreign language. An occupational curriculum concentration is defined as earning at least three credits in one specific labor market area. Labor market preparation areas include: Agricultural and Renewable Resources, Business, Marketing and Distribution, Health Care, Protective and Public Services, Trade and Industry, Technology and Communication, Personal and Other Services, Food Service and Hospitality, and Child Care Education. I dummy code this variable to reflect an academic concentration versus all other concentrations (academic=1, other=0).

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[3] Transcript-reported outcomes are often preferable to student-reported outcomes since there is often more error or misreporting in the former than the latter. Track placement is particularly susceptible to error in this regard. Rosenbaum (1980) found that students often misperceive which track they are in. Consequently, transcript-reported track outcomes are a better way of assessing track placement than self-reports.

I also use a school-level variable to gauge the percentage of students in the academic track in some student-level analyses. Since attending a school with a higher percentage of students in the academic track may affect a student's likelihood of being in the academic track, I control for this effect by including the school-level variable in the analyses. The indicator comes from the school administrator portion of the base year wave of ELS and asks administrators to report the number of students in the academic track.

School-Level Independent Variables

Choice (School Type). The primary independent variable in all my analyses is school choice.[4] I define school choice as enrollment at a public magnet school, other public schools of choice or open enrollment school, Catholic school, or non-Catholic private school. Regular public schools (designated in the data set as public comprehensive school) serve as the primary point of comparison. Although ELS distinguishes between a number of different school types, I collapse school type into three groups: 1) regular public schools 2) public schools of choice (magnet & other public schools of choice) 3) and private schools (Catholic and non-Catholic private schools). My final sample consists of 256 regular public schools, 68 magnet schools, 165 other public schools of choice, 91 Catholic schools, and 57 non-Catholic private schools (See Figure 3.2). In

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[4] ELS differentiates between various forms of school type – twenty in all. They include: a) comprehensive public high school b) public magnet school, c) public magnet school with a specialized academic theme, d) public school of choice, e) year round school, f) high school served by an area vocational center g) full time technical or vocational school h) other technical or vocational school, i) Catholic diocesan school j) Catholic parish school k) Catholic religious order school l) Catholic independent school m) other private school with a religious affiliation n) other private school with no religious affiliation, o) boarding school, p) reservation school, q) military academy, r) alternative/stay-in-school/dropout prevention school/continuation school, and s) charter school.). School administrators were asked to report which designation best described their school.

multivariate analyses I use dichotomous indicators of public schools of choice and private schools, comparing the influence of each to the impact of regular public schools.

(Insert Figure 3.2 about here)

School SES. At the school level, I use the aggregate of student SES to measure school SES. Although the percentage of students on free lunch is also typically used to assess school SES, this indicator proves problematic when trying to draw inferences about private schools, since these schools typically enroll few if any students living at or below the poverty line. Therefore, I use the aggregate measure of SES since it is a more precise way of gauging school-level SES in private schools.

School Racial Composition. Like school SES, school racial composition is another variable that may be associated with school type (choice vs. regular public) but may also affect the track placement of students. I measure school racial composition using the percentage of minority students in each school. ELS includes these data for three school years, 2000-2001, 2001-2002, and 2002-2003. In order to establish temporal precedence, I use data from the 2001-2002 school year. This variable runs concurrent with other base year data from ELS.

10th Grade Achievement. While it is certainly plausible that school organization affects achievement gains, it is also equally likely that the level of achievement within a school might also affect the level of organization in a school as well as achievement gains that occur. I attempt to account for this possibility by controlling for 10th grade school achievement. I use 10th grade math IRT score to measure 10th grade achievement. In school-level analyses, I aggregate these scores to obtain a school mean.

School Facilities/Materials and Behavioral Climate. In addition to choice and base year achievement, the physical condition, educational resources, and behavioral climate of a school may affect how well organized the school is. Although physical environment and educational resources have been important to school research historically (Coleman et al. 1966; Kozol 1991), these factors seem to be absent from the effective schools literature. I generate a composite variable taken from a set of questions in the School Administrator portion of ELS assessing the extent to which learning is hindered by physical facilities as well as the availability of educational resources and supplies within schools to gauge the effect of material deprivation on school organization and achievement. Similarly, school behavioral climate may also affect school level organization. Those schools that are plagued with behavioral problems may devote more of their resources to improving general safety, leaving fewer human and financial resources to expend on other forms of organization. Less efficient organization may lead to lower achievement. I control for this effect by creating a second composite variable. I create these composites by simply averaging all of the indicators which comprise them.[5] [6]

Urbanicity and Region. To account for variation in the availability of choice schooling, I control for urbanicity (rural, suburban, urban) and region. The omitted category for urbanicity is urban; the omitted category for region is the Northeast.

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[5] The composite variable for school physical condition assessed the extent to which learning was hindered by: poor condition of buildings, poor heating/light/air, poor science labs, poor fine art facilities, lack of space, poor library, lack of texts/supplies, too few computers, and lack of multi-media. These items are taken from the base year of ELS.

[6] The composite variable for school behavioral climate assessed how often the following issues were problems at school: tardiness, absenteeism, class cutting, physical conflicts, robbery/theft, vandalism, use of alcohol, students on drugs/alcohol, sales of drugs near school, possession of weapons, physical abuse of teachers, racial tension, student bullying, verbal abuse of teachers, disorder in classrooms, student disrespect of teachers, gang activity, cult/extremist group activities. These items were drawn from the base year of ELS.

Student-Level Independent Variables

Student Demographic/Background Characteristics. In Chapter Five, I use student-level race and SES to assess the effects of school choice on the relationship between these characteristics and student-level achievement and track placement. I use student-level gender in all models as a control variable. Student race is a categorical measure taken from the student questionnaire in ELS. When a response was missing from the student questionnaire, race was imputed from the sampling roster or the parent questionnaire. When student race was missing from both of these, race was "logically imputed" from other questionnaire items (surname, native language, etc). Student SES is a composite variable developed from five equally weighted, standardized components: father's education, mother's education, family income, father's occupation, and mother's occupation. Duncan's 1961 SEI index was used to determine occupational prestige. The Duncan SEI is a measure of occupational status based on the income level and educational attainment associated with each occupation (see Duncan 1961 for more details). Finally, gender is taken from the student questionnaire. While I am not interested in the specific effects of choice on the relationship between gender and achievement or track placement, the literature shows that boys generally have higher math scores than girls (see Riordan 1997 for review). I control for this effect by using gender as a control my analyses.

LIMITATIONS OF THIS STUDY

This study, like all research, has its share of weaknesses. First, due to limitations in the data set, I am unable to determine whether the students in schools classified as magnet and other public schools of choice attended as a matter of choice or because the

school is located in their regular attendance zone. For example, if a student in the data set attends a magnet school, the data set does not provide any information regarding whether that student was formally enrolled in the school's magnet program (a medical magnet program, a fine arts magnet program, a foreign language magnet program, etc) or whether the student attends the school because it was the school they were assigned to (i.e. whether the student lived in the school's designated attendance zone). This is especially problematic if public schools of choice differ from regular public schools in terms of achievement. The absence of information in this regard makes pinpointing the precise cause of the difference difficult. Is the cause a result of the "school within a school" differential? That is, do the specialized programs and curricula magnet students are exposed to create achievement differences between them and their same school, non-magnet program counterparts? Similarly, in non-specialized public schools of choice (here the schools designated as "other public schools of choice"), do students who choose to attend those schools do better than students who attend the school because it is in their designated attendance zone? One reason the former set of students may do better is because students who choose are likely to possess a host of characteristics associated with high achievement (be more motivated, have more involved parents, etc. (Martinez, Godwin, & Kemerer 1996; Lauen 2007; Lee, Croniger, & Smith 1996; Wells 1996). Consequently, this possibility makes assessing the true (as much as can be determined) relationship between choice and achievement less precise.

The second primary limitation in this study concerns notions regarding the appropriate level of study necessary to examine the effects of choice. Economists argue that since choice is supposed to increase competition among schools, ideally one should

compare *entire schools systems* that offer choice to entire systems that do not offer choice.[7] According to this perspective, competition will increase only among schools located within whole systems that offer choice because otherwise, choice is too limited to make a meaningful impact. In this scenario, every school would (theoretically) be a choice school. This study does not compare systems. Rather, I limit my analysis to schools. I limit my analysis to schools for a number of reasons. First, there is no comprehensive database that classifies districts in this manner. Surprisingly, though NCES sponsors the Common Core of Data and the Private School Survey, both which catalogue basic school demographic information for the entire universe of public and private schools in the nation, NCES does not compile information on choice status at the district-level. In addition, states and districts themselves vary on the quality of data available on choice beyond the school-level. ELS, the data set used here, includes large urban districts as well as their smaller, more rural counterparts. Depending on the size of the district, district-level websites, though a convenient way to access district-level information, often differ in quality and depth of information.   Given these considerations as well as the amount of time and labor necessary to collect this information at the district-level, I limit my analysis to schools and not entire school districts. This limitation may not be entirely problematic. Comparing schools falls within the spirit of Chubb and Moe's work. More specifically, although Chubb and Moe emphasize the increase of competition in a choice system, the authors themselves analyze schools and not districts. Furthermore, I am also interested in how choice affects the organization of schools. If

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[7] Personal communication with Sarah Reber, Department of Economics, University of California at Los Angeles. Spencer Fall Fellows Workshop, October 26, 2007. Santa Monica, CA.

choice is supposed to affect the inner workings of schools as Chubb and Moe argue, then a school level should suffice.

CONCLUSION

The purpose of this study is to examine how school choice affects school-level organization and achievement as well as the relationship between race, SES, achievement, and tracking. I present the results of analyses examining the effects of school choice on school organization and school-level achievement gains in Chapter Four. In Chapter Five, I examine the effects of school choice on the relationship between school choice, race/SES, achievement and tracking. I test predictions made by conflict arguments which suggest that achievement inequality will be enhanced and not ameliorated by school choice. These arguments maintain that once poor and minority students enter choice schools, other means of maintaining inequality, like unequal track placements, will be emerge. In Chapter Six, I assess the validity of two models predicting different processes and outcomes as the result of school choice. On the one hand, the market model predicts that choice will enhance achievement. This model predicts that choice will force schools to become more organized in order to compete for a clientele of students and parents. Conflict models, on the other hand, predict that choice will increase the number of poor and minority parents attending choice schools, especially public schools of choice. This increase will result in a smaller proportion of students in the academic track and a reduction in overall levels of achievement in choice schools.

CHAPTER FOUR

SCHOOL CHOICE: SCHOOL-LEVEL ORGANIZATION AND ACHIEVEMENT

A perpetual perception of American education is that schools are in "crisis" and need reform. The most recent directive aimed at resolving the "crisis" has materialized in the form of school choice. No Child Left Behind, the federal act which mandates the use of standards and testing to assess the progress of America's children, also grants students the freedom to leave failing schools and *choose* a higher quality alternative. Hence, choice is now a central focus of education reform.

In this chapter, I examine the effects of school choice on two school-level outcomes – school-level organization and school-level achievement. Two principal research questions guide the analyses presented in this chapter. First, does choice affect the organization of schools? If so, how? Second, do school organizational factors affect school-level achievement? If, so how?

BACKGROUND

Broadly conceptualized, school choice has always been a feature of the American education system. Opting out of public schools and choosing a non-public alternative has always been an option for parents who had the financial means to send their children to private school. According to Collins (1980), the decentralized nature of the American political system historically facilitated the creation of schools which operated outside the confines of state and local governments. Moreover, the multiethnic nature of the American public contributed to the creation of schools and decisions by parents to opt out of local common schools. In the 19th and early 20th century, immigrant groups wanted schools that operated outside the reach of White Anglo Saxon Protestant control. Rather

than subject their children to indoctrination into Protestant culture, immigrant groups created their own schools to not only ensure that their children would receive an education in their own status culture, but also to broaden access to education for immigrant youth (Bryk, Lee, & Holland 1993; Collins 1980; Reese 1986).

In the modern era, however, school choice and the arguments for implementing it as an option in contemporary education have taken a decidedly market turn. The notion of applying the market metaphor to American schools was introduced in the 1960s by the economist Milton Friedman. Friedman (1962) was one of the first advocates of modern-day school choice when he fashioned early ideas for a voucher system. According to Friedman, though nationalized or government controlled schooling was necessary for a productive and stable society, the state had a monopoly over schools, and Friedman argued that competition was vital to "protect the interests of parents and students" (p. 93). According to Friedman, a voucher system where parents were given the cost equal to a public school education if they opted to send their children to private schools would promote competition, the "injection" of which he adds, "would promote a healthy variety of schools" (p. 93). Thus, a market approach to education would not only better meet the demands of parents and students, but it would improve the educational system as a whole.

In the spirit of Friedman, publicly funded private options (also known as private school vouchers) have expanded with the passage of the No Child Left Behind Act of 2001, the federal government's expansive attempt at education reform. Vouchers essentially use public funds (i.e. tax dollars) to offset the cost of attending private school. The specifics of voucher differ from state to state. Funds are typically distributed by the state. Award amounts can range from the entire costs of attending a private school

(usually capped at some specific maximum) to an amount equal to the public school per-pupil operating costs. Rather than cover private school tuition directly, some states offer tax credits to parents who send their children to private schools (US Department of Education 2007). In general, the idea is that increased options for parents will generate competition, and in turn, increased achievement, among schools.

In addition to private school vouchers, public school choice has been a major directive of recent public policy initiatives, particularly the No Child Left Behind Act. Public choice emerged, in part, out of efforts aimed at achieving equity and excellence (high levels of achievement) in schools. In terms of equity, the public choice movement can be traced to attempts to achieve racial balance, particularly efforts to circumvent mandatory race-based student assignment plans (Wells and Crain 2005) as well as efforts to reduce disparities in achievement between various groups of children and ensure that all children have access to a "high-quality" education (No Child Left Behind Act 2001). Another segment of choice schooling emerged from efforts to improve excellence, i.e. overall levels of achievement in schools. The most notable and successful endeavor in this regard is the East Harlem, NY magnet program. Once known for their dismal levels of performance, the district, which serves mostly poor Black and Hispanic students, instituted a choice option in 1973 in an effort to raise achievement. The program has seen phenomenal success. The East Harlem district was the worst of the 32 New York City Districts when the program began; it now ranks among the best (Fliegel 1993).

Recently, No Child Left Behind has increased the relevance of public school choice. The law contains a choice clause which gives students attending high poverty schools that fail to meet testing standards the option to leave those schools and choose a

higher quality (i.e. one that meets the testing standards of the law) alternative. Market

philosophies clearly influenced the development and implementation of the law (or at

least the rhetoric surrounding the reform), as seen in a speech given by Secretary of

Education Margaret Spellings to a group of parents and educators in 2007. Spellings'

language mirrors Friedman's sentiments regarding choice and competition:

> But at the same time, students need lifelines now. If a school falls short of
> standards for several years running, families need options—so we're
> providing 300 million dollars in scholarships for students to receive free
> intensive tutoring, or transfer to better-performing schools. Wealthy
> parents already have the power to choose the school that's best for their
> child. Why shouldn't low-income parents have that same power? Families
> want choices. And we all benefit from them. By supporting a range of
> options for parents and <u>injecting a little competition</u> into the system, we
> support innovations that help all of us do better, especially students.
> (Remarks made at the National Summit on SES and Public School Choice
> Indianapolis, IN June 2007).

The market metaphor gained increased attention with the publication of Chubb

and Moe's *Politics, Markets, and America's Schools* (1990). According to Chubb and

Moe, the problem with the US educational system is institutional and political, but the

solution is a squarely market one. Chubb and Moe charge that in the US, public schools

are governed by a diffuse and heterogeneous constituency, represented by a

democratically elected school board. Because of this heterogeneity and the necessity of

political compromise, public school goals tend to be weak and ambiguous. Under a

democratic system, the interests of students and parents carry no special weight.

Moreover, the governance and internal organization of public schools is constrained by

bureaucratic rules and regulations that limit the autonomy and creativity of teachers and

principals. Chubb and Moe contend that the only way to free American schools from

mediocrity is to shift to a system of school choice where markets and not democracy and bureaucracy create a clientele for schools.

Market models of education predict that choice will spur competition among schools for a clientele of students and parents. According to Chubb and Moe, competition and choice should increase the achievement of schools by improving school organization. By school organization, the authors mean the internal operations of schools or "the *process* through which schools produce desired outcomes". To that degree, market proponents, Chubb and Moe in particular, maintain that a system of choice will make schools organize more effectively. Chubb and Moe identify four specific dimensions of school organization that influence the achievement of students: Personnel, goals, leadership, and practice. The first dimension, personnel, identifies the characteristics specific to teachers that affect student achievement. These characteristics include teacher quality, teacher influence and efficacy, teacher absenteeism, teacher experience, teacher collegiality, teacher professionalism, etc. The second dimension, goals, refers to the objectives schools aspire to meet. Basic literacy skills, academic excellence, human relation skills, and specific occupational skills are all goals that schools may try to accomplish. Chubb and More contend that when schools have strong academic missions and make academic excellence their goal, they are more likely to have higher levels of achievement. Thus, setting high expectations for students is one way to increase achievement.

The third dimension, leadership, refers to the power principals have to shape their organizations. Leadership embodies the principles of autonomy and freedom from bureaucracy that Chubb and Moe identify as being central to the effective organization of

schools. Schools in which principals have the capacity to establish school policy, have

control over their school's personnel policies, and are dedicated to their jobs are more

likely to exhibit higher levels of achievement. The fourth dimension of school

organization identified by Chubb and Moe, practice, involves "how programs are carried

out, services provided, and children taught". Chubb and Moe add that practice includes

most of the activities within a school that are directly related to education, for instance

assigning homework, the enforcement of discipline, and academic tracking.

Despite Chubb and Moe's assertion, little research has examined whether choice

actually affects the inner workings of schools. In their analysis of choice and schooling,

Chubb and Moe find that schools with less administrative constraint (i.e. bureaucratic

influence) were more organized. However, a larger body of research has assessed the

effects of choice on achievement. This research uncovers mixed evidence regarding the

effects of choice on achievement. At the aggregate (school/district) level, Schneider,

Teske, and Marschall (2000) found that districts with increased public choice options had

higher aggregate levels of achievement than districts with fewer choice options or no

choice at all. At the student level, some research suggests that public choice does little to

enhance student achievement (Witte 1993; 2000) while other research suggests that

students in magnet schools have greater achievement gains (Gamoran 1996; Plank,

Schiller, Schneider, Coleman 1993; Rolf 1990).

Research on private schools, particularly Catholic schools, is much less equivocal.

The literature suggests that Catholic schools outperform public schools because of the

organizational characteristics, both academic and social, possessed by these schools

(Coleman & Hoffer 1987; Bryk, Lee, & Holland 1993). The literature generally offers

two primary explanations for the public school/Catholic school difference. First, Catholic schools have more academic requirements and do not engage in tracking to the degree that comprehensive public schools do. Consequently, students in Catholic schools are required to undertake more rigorous academic coursework. This means that students in Catholic schools, in spite of differences in "ability", have similar academic experiences. Second, researchers argue that Catholic schools comprise value communities, where families share similar values about schooling and child rearing. The communal organization of Catholic schools enhances teacher efficacy and satisfaction and facilitates interaction between parents which in turn lead to higher levels of achievement for students. However, although work on Catholic schools suggests that they possess those characteristics which Chubb and Moe claim are consistent with organized schools, there has been no research that systematically compares them in this regard to public schools of choice and other private choice options. This project attempts to fill this gap.

SUMMARY AND HYPOTHESES

Market models claim that choice will enhance school organization and in doing so, will increase the achievement of students. Consequently, I formulate the following hypotheses:

Hypothesis 1 - Organization: Choice will enhance the organization of schools. According to the market model, public schools of choice will be "more organized" than regular public schools. Catholic and private schools will be "more organized" than regular public schools and public schools of choice since they are free of the constraints that limit the public sector.

Hypothesis 2 – Organization and Achievement: Choice will enhance aggregate levels of achievement. School organization will have a strong effect on achievement, and the effects of choice and sector on achievement should diminish once organization is taken into account.

METHODS

Measures

Dependent Variables

School Organization. Because of the centrality of Chubb and Moe's (1990) work to the school choice debate, the variables I choose to represent school organization stem from their well-known work. ELS contains a number of different items that reflect the various aspects of autonomy, governance, and effectiveness conceptualized by Chubb and Moe. Chubb and Moe identify four specific dimensions of school organization that influence the achievement of students: Leadership (the authority and autonomy of principals), personnel (characteristics specific to teachers that affect student achievement), practice (how programs are carried out, services provided, and children taught, i.e. the activities in a school related to education), and goals (the objectives schools aspire to meet). They develop an index of school organization based on these four dimensions using indicators obtained from High School and Beyond. These variables are summarized in Tables 3.3 and 3.4 of the previous chapter.

I use a corresponding set of measures from ELS to approximate the indicators used by Chubb and Moe.[8] I select these variables solely on the basis of their theoretical similarity to the items and concepts developed by Chubb and Moe. However, I conduct

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[8] Chubb and Moe use data from the 1980 High School and Beyond survey and its Administrator and Teacher Survey supplement.

statistical tests to verify the strength of these claims against the data at hand. I summarize the variables I select to represent the various facets of school organization in Table 3.5 (see Chapter Three). I create a school organization index by standardizing each of the measures, averaging them, then standardizing the average. The mean of this scale is set to zero and standard deviation is set to one.

Leadership. According to Chubb and Moe, successful schools have strong leaders. Principals of effective schools have a clear vision, are dedicated to teaching, and are knowledgeable about education. Chubb & Moe also note that in market settings, principals have more authority. They are governed less by the overarching bureaucracy of school boards and instead have the freedom to execute "bold, aggressive and innovative moves". Thus, because private school principals have more autonomy and flexibility, they are able to manage their schools more effectively. Moreover, principals of successful schools motivated more by their dedication to teaching and education and less by career advancement. Chubb and Moe claim this is often the case with public school principals, who seek principalships as part of an agenda to move even higher up the bureaucratic ladder. These principals don't really want to be principals; instead they seek more advanced positions in the administrative hierarchy of which being a school principal is a stepping stone of sorts.

ELS contains eight items that directly assess the authority and autonomy of principals, but lacks items that assess principal's vision, motivation, etc. Therefore, my measures reflect the authority and influence of principals over various facets of school policy and not personal aspirations or motivations. These items are as follows: hiring and firing teachers, establishing policies and priorities for grouping students into classes,

deciding what courses will be offered, selecting textbooks and other instructional materials, setting curricular guidelines, establishing policies and practices for grading and student evaluation, establishing discipline policies, deciding how school funds will be spent. The range of possible responses included "no influence", "some influence", and major influence". Each of the measures reflects the level of authority and autonomy principals are able to exercise in their schools.

Personnel. The second dimension of school organization conceptualized by Chubb and Moe is personnel. This concept refers to the characteristics and behaviors of teachers including their social relations with colleagues, feelings of efficacy and perceived influence, absenteeism, etc. Chubb and Moe contend that the bureaucratization of schools affects personnel in a number of ways. It not only limits the autonomy of principals to hire the kinds of teachers they need to make their school successful, but also leads to the tyranny of unions who bestow teachers with too much control over school policy. Chubb and Moe argue that when personnel decisions (including the reward structure for performance and punitive consequences for the lack thereof) are left to the principal and uninfluenced by teachers unions, teachers will perform at higher levels.

I use the following indicators to represent the personnel dimension described Chubb and Moe: the percentage of teachers in the school considered excellent by the principal, teacher morale is high, there is often conflict between teachers and administrators, many teachers have a negative attitude about students. Each of these measures reflects the characteristics of teachers that are likely to influence student achievement.

Practice. The third dimension of school organization conceptualized by Chubb and Moe is practice. Practice refers to "how programs are carried out, services provided, and children taught". This dimension includes most of the activities within a school that are directly related to education, for instance assigning homework, the enforcement of discipline, and academic tracking. According to Chubb and Moe, most people regard practice as "what education is all about". There are a number of different indicators that may be used to examine the activities in a school related to education. School administrators were asked to indicate how well each of the following characteristics described their school's environment: teachers at this school press students to achieve academically, discipline is emphasized at school, classroom activities are highly structured. Each of these items were rated on a 5-point scale with responses ranging from not at all accurate to very accurate. I also include the percentage of students in the academic track and the hours students spent on homework as part of the measure of practice.

Goals. Chubb and Moe define goals as what schools "try to accomplish".   As a consequence of the democratic nature of school governance and the diversity of the constituency of public schools, Chubb and Moe contend that school goals tend to be weak and "watered down". Schools are typically asked to accomplish varied ends that may or may not be directly related to academic achievement or academic excellence. These objectives may range from sex education to student socialization to cultural sensitivity training to vocational training. According to Chubb and Moe, since the 1960s, the growth in school objectives has contributed to increased differentiation in course offerings and requirements.

The authors note that although formally articulated goals, for example, like those published in an organization manual or posted on a bulletin board, affect achievement, informal expectations for students are also meaningful for student achievement. Consequently, Chubb and Moe operationalize goals in two ways: as the number of years of instruction required in five subjects (Math, English, History, Science, & Foreign Language) to receive a diploma, and as the priority of academic excellence. The latter item included a list of 7 other potential goals, and principals were asked to rank academic excellence among them.[9] While ELS does not include a measure that examines the priority of academic excellence as assessed by school administrators, the data set does include an item assessing the graduation requirements in eight subjects for each school. School administrators were asked to indicate how many years of coursework were required in the following subjects in order to graduate: English, Math, Science, History, Computer education, foreign language, fine arts, and physical education.[10] I include graduation requirements for math only. This measure allows me to differentiate between schools that have high expectations for their students and schools that have fewer expectations for students.[11] [12]

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[9] Principals were asked to rank the following items as school goals: literacy, citizenship, occupational skills, work habits and self-discipline, academic excellence, personal growth, human relations, and religious values.

[10] The response range and the recoded scale for this question is a follows: 1) course not offered (recoded as 0) 2) none (recoded as 0) 3) less than 1 year (recoded as .5) 4) at least 1 year but less than 2 (recoded as 1.5) 5) at least 2 years but less than 3 (recoded as 2.5) 6) at least 3 years but less than 4 (recoded as 4.5) 7) 4 years (recoded as 4).

[11] While ELS includes an item asking school administrators to assesses the extent to which sports were emphasized at their school, this item leaves much to be desired. Therefore I exclude this measure from my analyses.

[12] Factor analyses reveal that the factor loadings of 3 other core subjects (English, History, and Science) do not load on the organization factor. Therefore I exclude the other core academic subjects from the measure of school organization.

Achievement. Math achievement is the second dependent variable in this analysis.[13] I use the gain (difference) in IRT math scores between 10th and 12th grade to measure achievement. Gain scores are suitable for a number of reasons. Some (Allison 1990; Ballou 2002; Chubb & Moe 1990) argue that student progress as measured by gain scores is a better indicator of school quality than average score alone. For example, high scores in a wealthy school with wealthy students may reflect the advantages of student's home background and not the school's academic environment. However, while a school with poor students may have significantly lower average test scores than its wealthier counterparts, a strong and dedicated faculty may work hard to significantly improve scores from one year to the next. Thus, overall mean achievement is obscured by the influence of family background while achievements gains are considered a purer indication of a school's contribution to achievement.

One of Chubb & Moe's central tenets suggests that choice schooling will increase overall school achievement by enhancing school organization. Based on their claims, choice schools, whether public or private, will be more 'effectively' organized and consequently demonstrate higher levels of achievement. To obtain a mean score for the school, I calculate overall school achievement gains by first creating an achievement gain score for the sample of students in each school. I do this by subtracting 12th grade math score from 10th grade math score for each individual student from the sample of students within each school. I then aggregate individual scores to generate a school score.

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[13] I use math achievement for theoretical as well as practical reasons. First, unlike reading achievement, math skills are considered less the result of home background and more a product of schooling. Enhanced parental language skills in higher socioeconomic homes contribute to higher reading scores among students from these homes compared to their lower SES counterparts. The second justification for using math scores rather than reading scores involves limitations of the data set. Although ELS includes a measure of 10th grade reading achievement, it does not contain a 12th grade reading score. Therefore I am forced to exclude reading achievement from my analyses.

Independent Variables

Choice. I define school choice as enrollment at a public magnet school, other public school of choice or open enrollment school, Catholic school, or non-Catholic private school. Regular public schools serve as the primary point of comparison.[14] [15] [16]

10th Grade Achievement. While it is certainly plausible that school organization affects achievement gains, it is also equally likely that the level of achievement within a school might also affect the level of organization in a school as well as achievement gains that occur. I attempt to account for this possibility by controlling for 10th grade school achievement. I use 10th grade math IRT score, aggregated at the school level, to measure 10th grade achievement.

School Physical Condition and Behavioral Climate. In addition to choice and 10th grade achievement, the physical condition, educational resources, and behavioral climate of a school may affect how well organized the school is. Although physical environment and education resources have been important to school research historically (Coleman et al. 1966; Kozol 1991), these factors seem to be absent from recent effective schools literature. I generate an index developed from a set of questions in the School Administrator portion of ELS assessing the extent to which learning is hindered by

[14] Although, the data set does distinguish between a number of different school types, the "other public school of choice" category is somewhat nebulous and problematic to this extent. This designation comes directly from the data. It is not clear whether this term indicates that the district where the school is located offers a district-wide choice program, thereby making the school a school of choice. Nevertheless, I use the term as an indication that the school enrolls students outside of its regular or traditional attendance zone.

[15] I exclude boarding schools, reservation schools, military academies, alternative/stay-in-school/dropout prevention school/continuation schools, and charter schools from all analyses. Although charter schools are schools of choice and pertinent to the present discussion, there were too few in the data set (n=8) to analyze. Similarly, the other schools listed here are non-traditional schools and are not relevant to the research questions at hand.

[16] When school administrators chose more than one way of designating their school, I used the following criteria to classify a school. Schools were categorized as choice schools when they were designated as choice schools by schools administrators in any way. For example, if a school was listed as a comprehensive public high school and a magnet school, the school was classified as a magnet school. If a school was listed as a Catholic school and a public school, the school was classified as a Catholic school.

physical facilities as well as the availability of educational resources and supplies within schools. These questions assess the degree to which learning was hindered by the poor condition of buildings, poor heating/light, poor science labs, etc. Similarly, behavior problems may limit the degree to which schools can direct resources to being organized. I control for this effect by creating a second index. For this index, I use a set of 19 indicators assessing the extent to which various behaviors, including physical conflict, robbery, gang activity, student disrespect of teachers, sale and use of illegal drugs, etc. are a problem at the school (See Table 4.4). I generate these indices by first standardizing the indicators in the index, averaging the indicators, then standardizing the average. This is consistent with the procedures used by Chubb and Moe to create indices (See Chubb and Moe, Appendix B, p.235).

(Insert Table 4.1 about here)

School SES and Racial Composition. I use school SES and racial composition to gauge the resources available to schools and assess the characteristics of the student body and how these aspects affect school-level organization and achievement. I aggregate student SES to examine the effects of school SES on school organization and school-level achievement. Although the percentage of students on free or reduced lunch is frequently used in research investigating school effects, this variable proves to be problematic when Catholic and private schools are included in these analyses. School lunch programs provide free or reduced price meals to students from families living at or below the poverty line. Since Catholic and private schools typically have few students fitting this criteria, this method of assessing SES would yield little useful information about these schools. However, given that the sampling design of ELS involved the random selection

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of students within schools, we can expect that the aggregate of student SES would sufficiently and accurately capture overall school SES. More specifically, the random selection of students means that all students had an equal chance of being selected to participate in the survey. Thus, no one SES classification should be over-represented in the sample of students.

Similarly, since minority status and income are highly related, schools with high concentrations of minority students may have fewer resources, and in turn lower achievement. I control for this by accounting for the percentage of minority students in a school. This indicator is taken from 2001-2002 Common Core of Data and included in the restricted version of ELS.[17]

Urbanicity and Region. Choice schools, especially magnet schools, are typically more abundant in urban areas. To account for variation in the availability of choice schooling, I control for urbanicity (rural, suburban, urban). The omitted category for urbanicity is urban. Similarly, regional differences may account for variation in choice availability as well as achievement (NCES 2001). The omitted category for region is the Northeast.

Analytic Strategy

Constructing the School Organization Variable. In addition to basic measures of central tendency and variance, I conducted a confirmatory factor analysis to test the validity of the four factor structure of school organization proposed by Chubb and Moe. More specifically, in their analysis testing the effects of school choice on school organization, Chubb and Moe contend that school organization is a broader factor composed of four underlying dimensions: leadership, personnel, goals, and practice.

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[17] Unlike the public use version, this variable is continuous and not categorical. This is advantageous, since it simplifies the analysis and permits a more detailed interpretation of the results.

Leadership reflects the characteristics of principals; personnel reflects traits and qualities possessed by teachers; practice refers to the procedures and methods used to instruct, group, and discipline students; and goals refer to what schools try to accomplish. However, Chubb and Moe never empirically test the assumption they make regarding the factor structure of their organization model.

Although I attempt to remedy this oversight on the part of Chubb and Moe, my comparison to their work is complicated by a data mismatch. Chubb and Moe use data from the 1980 and 1982 High School and Beyond Survey (HSB) and the 1984 Administrator and Teacher Survey supplement to HSB, while I use data from a different survey collected over 20 years later.[18] Consequently, there is not a one-to-one correspondence among the variables in the two data sets. For example, Chubb and Moe's leadership dimension assesses the characteristics of principals – their motivations for seeking a principalship, principal's administrative aspirations, principal's dedication to teaching, etc. However, these variables were unavailable in ELS. Therefore, the indicators I use to represent leadership measure the amount of control and autonomy principals have over decision making in schools, not their motivations for becoming a principal. Thus, although I painstakingly selected variables similar to those selected by Chubb and Moe, it is prudent to empirically assess the validity of my selections. Factor analysis will verify whether the variables I select to represent school organization comprise a unitary construct, making it suitable to combine them into a single index. Since I am attempting to confirm Chubb and Moe's four factor hypothesis, I use a confirmatory factory analysis (unrotated).

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[18] High School and Beyond is a widely used, large-scale, nationally representative data set that was also conducted by the National Center for Education Statistics.

Table 4.3 displays the results of the confirmatory factor analysis conducted using the school organization variables. Contrary to the factor structure predicted by Chubb and Moe, the variables I use to construct the school organization variable do not represent four separate dimensions of school organization. Rather, with one exception, these items all load on a *single* factor. This result is certainly not undesirable; on the contrary, this outcome simplifies the analyses to come. Still, there may be a number of reasons why this finding deviates from those predictions made by Chubb and Moe. On the one hand, Chubb and Moe do not conduct any analyses to empirically confirm the factor structure they hypothesize. Thus, though they suggest that the dimensions they outline represent four distinguishable, yet similar elements of an even broader, underlying factor, these results indicate that the four dimensions represent a single dimension and can be combined into a unitary index. On the other hand, Chubb and Moe's four factor presumption may in fact be more fitting within the context of their data (HS&B).

(Insert Table 4.2 here)

OLS Regression. This analysis addresses two major questions. First, to what extent does school choice affect school organization? Second, to what extent does school organization affect school-level achievement? The causal model forming the basis of this analysis is the market model (See Figure 2.1). I conduct two separate OLS regression analyses to address these questions. The first analysis employs school organization as the dependent variable, while the second utilizes school-level achievement gains as the dependent variable.

RESULTS

Descriptive Results

Table 4.3 shows school-level descriptive statistics by school type for all of the schools in the analysis. Within school type, the overall pattern for school organization, math gains scores, and 10th grade achievement scores is similar. The scale measuring organization is standardized so that the mean is set to zero. Therefore, negative scores indicate that a school has an organization score below the mean while a positive score indicates that a school has an organization score above the mean. Catholic (.65) and private (.62) schools have positive scores, and therefore appear to be more organized than regular public schools (-.22) and public schools of choice. However, other public schools of choice (-.12) seem to be slightly more organized than regular public schools, although both sets of schools have negative organization scores. Catholic and private schools also have higher 10th grade achievement scores. However, among public schools, magnet schools are the least well organized (-.24) and have the lowest base year achievement (41.03) scores among public schools. Catholic and private schools have the highest math gain scores (6.58 and 6.32 respectively), followed by magnet schools and regular public high schools (4.94 and 4.79). Other public schools of choice have the lowest gains in math achievement (4.57). All public high schools also report more problems with facilities and behavior than Catholic and private schools with magnet schools reporting the most problems in both areas.

Table 4.3 also shows that Catholic and private schools have higher aggregate SES levels than public schools. This scale is also set so that the mean is equal to zero. Positive scores indicate that schools have SES levels above the mean and negative scores

indicate that schools have SES below the mean. Among public schools, regular public schools have the highest SES levels while magnet and other public schools of choice have the lowest aggregate SES levels. Magnet schools have strikingly high numbers of minority students compared to all other schools types. This may be the result of a number of factors. On the one hand, magnet programs are often found in districts with high minority concentrations, in part because magnet programs are typically created to help schools within a district achieve racial balance. Often times, these programs are created to curb white flight or increase the representation of white students in high minority schools and districts (Blank, Steel, & Levine 1996). On the other hand, research shows that poor and minority parents are more inclined to choose a school when the opportunity is presented (Lee, Croniger, & Smith 1996; Martinez, Godwin, & Kemerer 1996). These factors may explain the high numbers of minority students in magnet schools.

Together the descriptive results presented here offer an interesting portrait of various school types. I turn to multivariate analyses to better understand the relationship between choice, organization, and achievement.

<center>(Insert Table 4.3 here)</center>

Does choice enhance school-level organization?

Table 4.4 reports the unstandardized coefficients from school-level regression analyses assessing the effects of school-level traits on school-level organization. In order to assess the unadulterated effects of school type, Model 1, the baseline model, includes 10th grade school achievement and school type only. Schools with higher 10th grade math achievement scores are more effectively organized than schools with lower levels of 10th

grade achievement. This suggests the relationship between achievement and organization may be reciprocal to some degree. Schools with higher levels of achievement may have an easier time organizing. Therefore, organization may not simply affect achievement, but achievement may also affect organization. These results also indicate public schools of choice are *less* organized than regular public schools (omitted category) . This runs contrary to arguments posed by choice advocates like Chubb and Moe. However, Catholic and private schools appear to be more effectively organized than regular public schools.

Model 2 adds physical facilities and behavioral climate to the analysis as well as the remaining school-level controls (school SES, percent minority, region and urbanicity). This model shows that 10th grade achievement, school SES, physical facilities, and behavioral climate have significant effects on school organization. As in the previous model, schools with higher 10th grade math achievement scores and Catholic schools are more effectively organized. Higher SES schools appear to be better organized while schools that report fewer problems with their physical facilities and educational resources (e.g. poor condition of buildings, poor science labs, etc.) and fewer behavioral problems are also more organized. This is not surprising. Schools with a more privileged student body possess a number of advantages that facilitate organization including greater financial resources, a better prepared student body, etc. Furthermore, schools with good facilities and fewer behavioral problems face fewer obstacles which might usurp resources that would otherwise be devoted to organizing.

To determine if physical facilities and behavioral climate mediate any of the effects seen in Model 2, I include a third model which eliminates physical facilities and

behavioral problems from the analysis. If physical facilities and behavioral climate do in fact mediate the effects of any of the variables in the previous model, then excluding these variables from the analysis will likely result in a significant finding among a variable that was previously not significant. Thus, comparing Models 2 and 3 will allow me to determine if better facilities and behavioral climate possible mediate the effect of Catholic or non-Catholic private schooling or school SES on school organization.

Comparing Models 2 and 3 yields two important findings. First, once problems with facilities and behavior are accounted for, non-Catholic private schools are not any more organized than regular public schools. Thus, it appears that the non-Catholic private finding in the previous model is mediated by physical facilities and behavioral climate. Since private schools are less likely to have poor physical facilities or behavioral problems, the private school advantage in organization diminishes once these factors are controlled.

Models 2 and 3 also illustrate an enduring Catholic school effect. That is, Catholic schools appear to be more organized even after school SES, 10th grade achievement, physical facilities and behavioral climate are controlled.   The endurance of this effect suggests Catholic schools possess some feature or characteristic that public schools of choice and non-Catholic private schools lack. Previous research attributes the success of Catholic schools to their unique social and communal organization (Byrk, Lee, & Holland 1993; Coleman and Hoffer 1987). This research points to the shared values (e.g. religious) that tie parents to the parents of others students. These values might ease the implementation of rules and policies that facilitate effective organization within Catholic schools. Others might contend that this finding supports the argument that

autonomy and freedom from the bureaucracy of a public school system encourages more

effective management. However, this interpretation is complicated by the fact that

private schools in this analysis do not appear to be any more organized than regular

public schools.

(Insert Table 4.4 here)

In sum, these results suggest that select private choice options, Catholic schools in

particular, enhance school organization. Public schools of choice appear no better

organized than their regular public counterparts. This finding may be a consequence of

the school organization measure and the relative autonomy of private schools from an

overarching authority structure. With the exception of charter schools, public schools of

choice, operationalized here as magnet and other public schools of choice, are still public

schools and to that degree are bound by the same rules and authority that govern regular

public schools. Since principal autonomy and control over school policy comprise a

sizeable portion of the organization index, the similarity in organization between public

schools of choice and regular public schools may be explained by a likeness in

governance structure. Similarly, since private schools are independent and therefore free

from the bureaucratic and democratic constraints of state and local school governance

structures, their seemingly enhanced organization is likely a consequence of such

freedom.

Do choice and school organization enhance achievement?

Given that public choice does not affect school organization as market advocates

predict, what effect does choice have on achievement gains? Table 4.5 presents the

unstandardized OLS results examining the effect of school-level attributes, including

school organization, on school-level math achievement gains. Model 1 includes 10th grade achievement and school type. These results mirror those seen in the previous analysis. Tenth grade math achievement has a significant positive effect on math achievement gains. Thus schools with high 10th grade math achievement have greater math gains. As in the previous analysis, math achievement gains between 10th and 12th grade in public schools of choice do not significantly differ from the gains in regular public schools. However, Catholic and private schools have higher math achievement gains than regular public schools.

Model 2 adds school organization to the analysis. According to market proponents, school organization should mediate the effect of school type on achievement. This perspective makes two predictions: first, school organization should have positive and significant effects on achievement gains and second, once organization is controlled, the effects of school type should diminish. However, the results presented here indicate otherwise. Surprisingly, these results show that school organization has *no* significant effect on math achievement gains. This directly contradicts the argument of market proponents. Moreover, the addition of school organization does not reduce the effect of Catholic and non-Catholic schooling. These effects remain strong, even after organization is taken into account.

Model 3 adds facilities and behavioral climate to the analysis along with controls for school SES, percent minority, region and urbanicity. The effect for physical facilities is positive and marginally significant, suggesting that schools with poor facilities have higher achievement gains than schools with better facilities. This effect is counterintuitive and opposite the effect seen in the regression for school organization.

Since this (achievement) regression controls for school organization, the sign flip suggests that a portion of the variance in school organization is related to physical facilities. Also unlike the school organization result, behavioral climate has a negative but insignificant effect on achievement gains. Again, this effect is different from the earlier regression, and suggests that school organization and behavioral climate are closely related. School SES has a strong positive effect on achievement gains. The effects of Catholic, and non-Catholic private schooling remain strong, even after controls for SES, facilities and behavioral climate are included. Since the effect of non-Catholic private schooling on achievement gains does not lose significance once controls are added, it appears these gains are not mediated by any other school-level features included in the model.

These results are surprising. First, school organization has no significant effect on school-level achievement, even before school SES was taken into account. This finding runs directly contrary to arguments made by advocates of the market model. Proponents of this model suggest that choice exerts an indirect effect on achievement via school organization. This being so, organization should affect achievement. However, it does not in the analyses presented here. Second, although Catholic *and* non-Catholic private schools have significantly higher math achievement gains than regular public schools, non-Catholic private schools did not appear any more organized than regular public schools once physical facilities and behavioral climate are controlled. This finding bolsters the case against the market model, since organization is theorized to act as the specific mechanism driving increased levels of achievement. What is clear from this analysis is that private schooling and school SES have strong and enduring effects on

achievement. That these effects persist after organization is accounted for suggests that these schools possess important characteristics that market models do not consider.[19]

<center>(Insert Table 4.5 here)</center>

DISCUSSION

Two primary findings emerge here, providing little support for the market model of school choice. The first set of findings suggest that public choice options do little to enhance school organization. In contrast, private choice options, Catholic schools in particular, seem to have a greater effect on school organization. Although non-Catholic private schools appear to be more organized than regular public schools initially, this effect was mediated by better physical facilities and an improved behavioral climate in these schools. Similarly, although Catholic and non-Catholic private schools demonstrated higher achievement gains than regular public schools, school organization did not account for this effect. In fact, school organization had no significant effect on school-level math achievement gains. Moreover, even though market models propose that school organization is the specific mechanism mediating enhanced achievement in schools of choice, the impact of Catholic and non-Catholic schooling remained strong even after school organization was introduced into the analysis.

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[19] I include results for analyses using data with listwise deletion in Appendices 4.1 through 4.3. Although over 200 schools were excluded from these analyses, the results do not differ dramatically from those presented here. There are three notable exceptions however. First, it appears that the effect of non-Catholic private schooling on organization remains significant in the full model when listwise deletion is employed as the missing data technique. In addition, school SES also has no significant effect on organization. Finally, non-Catholic private schools do not have significantly higher achievement gains than regular public schools in the listwise results. Instead, the achievement coefficient for non-Catholic private schools in the listwise analysis is negative and non-significant. This is not surprising and in no way reflects dubiously on the imputed results. Rather, it may suggest that the listwise results are biased. Almost half of the private school sample is excluded when listwise deletion is employed – the school-level N drops precipitously from 57 schools to 35 schools. The exclusion of one-third of the sample might explain the change in findings.

Except for the effects of Catholic schooling, these findings provide little support for the market model. Previous research suggests that Catholic schools are particularly successful at raising achievement for two primary reasons. First, Bryk, Lee, and Holland (1993) note that Catholic schools tend to minimize curricular tracking and academic differentiation, offering broad access to academic courses. This kind of academic organization produces higher levels of achievement because all students are exposed to the same curricular content and material. A second explanation for the Catholic school effect on achievement focuses on the social organization of Catholic schools (Bryk, Lee, and Holland 1993; Coleman and Hoffer 1987). This explanation posits that Catholic schools comprise "value communities" in which parents, students, and teachers share similar religious and social values. These shared values connect parents, teachers, and students to one another, creating a bond that facilitates enhanced achievement.

While the effect of Catholic schools on organization and achievement proved strong and unwavering, the effect of non-Catholic private schooling was more variable. This could be the result of heterogeneity among non-Catholic private schools, generally speaking as well as in the data set. In the data set, the non-Catholic private category includes non-Catholic schools with a religious affiliation as well as secular schools. Thus, these schools may differ greatly with regard to curriculum, student background, etc. Generally speaking, although non-Catholic private schooling is typically associated with "elite" or high status culture schooling, some evidence suggest that schools offering a vocational/technical or alternative focus may be represented in equal measure in the public and private sector (Coleman, Hoffer, and Kilgore 1982). Furthermore, evidence documenting the growth of Southern segregation academies as refuges for White

southerners fleeing court-ordered desegregation mandates suggest that many of these schools fall far short of elite (Crespino 2007; 2008) . In other words, all private schools are not created equal.

Taken together however, these findings run contrary to the arguments presented by advocates of choice (e.g. Chubb and Moe) who claim that choice will create a clientele for schools, forcing them to organize effectively in order to meet the needs of students. This may suggest that choice schools need not become more organized or enhance achievement to maintain a clientele. Rather, this finding appears to imply that public choice schools satiate the *non-academic* needs of parents and students. That is, as Chubb and Moe note, schools may perform a number of duties for parents and students, many of which may not foster increased academic achievement among its students.

However, if maintaining a clientele is important, as the market model claims, then parents may be more satisfied with schools when they meet parental expectations that are less relevant to academic achievement. Although market-based theories assume that parents are rational actors and base their school decisions on academic criteria alone, other research reveals that parents rely on a number of non-academic characteristics when choosing schools, including racial makeup of the student population, school safety, etc. (Henig 1996; Saporito & Lareau 1999; Schneider, Teske, & Marschall 2000). Moreover, Zernicke (2002) found that parents supported innovative, nontraditional upstart charter schools not because their children performed better in them, but because they were they were dissatisfied with the kinds of instruction found in traditional public schools and because the charter gave them a voice in such matters. Perhaps then, choice may not force schools to perform better academically in order to maintain a clientele. Rather, if

choice schools satisfy other non-academic needs and wants of parents, then they may find longevity.

One weakness of the present research is that the public schools of choice represented here are not consistent with "true" market conceptualizations of choice. It is unclear in this data set whether the schools of choice are located within districts that make choice widely aviable or whether these schools are one of a few choice schools in the district. Critics of public school choice reform argue that public choice options are typically limited to a handful of schools, making choice available to only a limited number of students. This leaves the traditional system intact, "and all the usual institutions of democratic governance in place" (Chubb and Moe 1990, p. 208). To this degree then, one cannot expect public schools of choice to differ markedly from regular public schools in terms of their organization.

The results of the analyses presented here provide an initial glimpse into how school-level traits like choice affect school organization and school-level achievement. In the next chapter I examine the effects of school-level attributes on race and class-based equity in achievement and track placement. More specifically I examine the effects of school choice and other school-level traits on four student-level relationships: the relationship between SES and achievement, race and achievement, SES and curricular track, and race and curricular track. In Chapter Six, I take the results of these analyses a step further and test the specific causal hypotheses and mechanisms set forth by the market and conflict models. I also compare the models in an effort to determine which model best explains the relationship between school choice and achievement.

CHAPTER FIVE

SCHOOL CHOICE: EQUITY IN ACHIEVEMENT AND TRACKING

Recently, school choice has become a major directive of education reform. A key provision of the No Child Left Behind legislation of 2001 allows students attending high poverty schools that have failed to meet the testing standards of the law for two concurrent years the option to transfer to a school meeting these standards. More generally, the spirit of No Child Left Behind as well as other types of education reform in the form of school choice envision choice as a means of reducing educational inequality. Choice is seen by many as a way of not only increasing the overall quality of the schools children attend (increasing excellence) but also reducing race and class-based gaps in achievement (increasing equity). However, a countervailing concern is that choice may lead to increased academic isolation for the students (i.e. poor and minority) it seeks to help.

In recent years, the debate surrounding school choice has become increasingly contentious and polemical. On the one hand, school choice advocates maintain that choice will combat inequality and increase achievement (Chubb & Moe 1990). On the other hand, critics charge that school choice policies may be *exacerbating rather than ameliorating* educational inequality.   Instead, opponents contend that choice may only transform inequality, shifting disparities that were once a between-school problem into a within-school occurrence. These critics argue that school choice will not only worsen racial and economic segregation, but will facilitate within-school tracking and inequality (Henig 1994; Wells 1996; Wells, Holme, and Vasudeva 2002). Therefore, although a major provision of No Child Left Behind gives students attending failing, high poverty

schools the option to choose a higher quality alternative, how likely is it that choice will enhance the achievement of those students, especially poor and minority students, opting to attend choice schools? As poor and minority students flee failing schools and enter choice schools in search of better opportunities, does education reform in the shape of school choice really deliver on this promise?

In the preceding chapter, I examined the effects of school choice on school-level achievement and organization. In Chapter Four, I demonstrated that school choice exerts separate and distinct effects on organization and achievement. More specifically, these analyses revealed that Catholic schools were better organized than regular public schools. Public schools of choice, however, appeared to be *less* organized than regular public schools. Similarly, while Catholic schools and non-Catholic private schools had greater achievement gains than regular public schools, this effect was not mediated by school organization. The Catholic school effect remained strong even after including controls for school SES, physical facilities, and behavioral climate.

In this chapter, I examine the effects of school choice on two student-level outcomes – math achievement and track placement/academic course-taking. The specific purpose of this chapter is to determine whether and how attending a choice school affects the relationship between student-level background characteristics and academic outcomes. More specifically, I assess the effects of school choice on race and class-based inequality in achievement and track placement/course-taking. Does choice reduce race and class-based gaps in achievement and track placement?

These analyses test predictions made by market and status conflict arguments. In the school choice debate, market models claim that school choice will create competition

between schools and improve student achievement. Conflict arguments contend that choice will not ameliorate racially and economically-based disparities in achievement. Rather, as local school systems shift to a choice option, poor and minority students may leave failing schools in poorer communities and flee to more affluent schools. Middle and upper-class White parents, either fearful of their children mixing with a different cultural element or losing their privileged position within schools, may push to maintain separate and advantaged placements for their children. Similarly, in an effort to achieve racial balance and attract white students to high minority schools, school systems establish magnet programs in schools with high concentrations of minority students. Since these programs were created to draw White students in, these students are more likely to gain access to coveted programs and placements within choice schools. Thus, unequal track placement becomes a tool which preserves the privilege of the privileged. According to this model, choice options inadvertently escalate inequality rather than reduce it.

The analyses I present in this chapter use Hierarchical Linear Modeling to test the effects of public and private choice options on the relationship between race and achievement, SES and achievement, race and track placement, and SES and track placement. HLM is particularly useful for analyzing this question for a number of reasons. First, as students are grouped into schools, HLM takes this grouping into account and produces larger standard errors than other statistical techniques. Second, HLM provides a modeling framework for researchers to estimate cross-level interactions. Thus, HLM can estimate the effects of choice on the race-achievement intercept (mean) as well as the race-achievement slope. In this way, I can determine whether choice

amplifies or attenuates the relationship between race/SES and achievement and race/SES tracking. In other words, does choice reduce or intensify inequalities in achievement and tracking between white and minority students? Between poor and non-poor students?

BACKGROUND

In examining the relationship between choice, school organization, and academic outcomes in schools, I compare two theoretical models: a market model rooted in economic traditions and a conflict model rooted in sociological traditions. Market models of education predict that choice and competition will force schools to organize more effectively. Milton Friedman (1962), one of the earliest proponents of the market model, argued that competition would "promote a healthy variety of schools", introducing "flexibility into schools systems" (p. 93). According to this model, competition would force schools to better serve the interests of parents and students. Ironically, Friedman argued that a choice/voucher system would have a leveling effect, reducing educational disparities created by existing socioeconomic inequalities. Later advocates of the model argue that the competition stimulated by choice would enhance school organization, facilitating the "process by which schools produce desired outcomes" (Chubb & Moe 1990). Therefore, choice should enhance the organizational efficiency of schools, forcing them to better perform the basic duties associated with schooling (assigning homework, enforcing discipline, encouraging students to do high level work, etc.). Market advocates argue that the increased organizational efficiency produced by choice is the specific mechanism driving increased achievement.

Although market models adequately explain achievement inequality *between* schools, they fail to sufficiently account for inequality in achievement *within* schools.

Thus, market models explicitly address differences between schools in school-level achievement, but fail to explicitly address how choice affects inequality between students within schools. The market model appears to imply that inequality might be reduced if overall achievement improves. In other words, a rising tide should lift all boats. Similarly, Chubb and Moe argue that better organized schools also increase the percentage of students in the academic track. Thus, markets will inevitably enhance a student's chance of being in the academic track. Previous research links academic tracking to inequality in academic achievement (Gamoran 1992; Oakes 1985); Chubb and Moe also contend that achievement is linked to academic course-taking. Thus, choice will reduce inequality in academic course-taking between students and increase achievement in the process.

Status conflict frames provide a useful alternative to implicit market assumptions regarding inequality in schools. According to this framework, choice parents from advantaged backgrounds erect barriers like selective admissions and academic tracking to limit the access of disadvantaged students to choice schools and to the best programs within choice schools (Wells, Holme, & Vasudeva 2002). Moreover, past research suggests that increased racial and socioeconomic heterogeneity increases de-facto tracking within schools (Lucas 1999; Lucas and Berends 2002). Because choice is likely to increase the racial and socioeconomic diversity of schools, tracking may be used as a tool to preserve status and privilege for those who already have it. Thus, as poor and minority students flee failing schools, choice schools may become "new and improved sorting machines" that mask inequality under the guise of choice (Moore & Davenport 1990; Wells 1996). Tracking may limit the achievement of those students in the lowest

tracks (Gamoran 1992; Oakes 1985; Oakes and Wells 1996), thwarting any benefits that

students attending choice schools might obtain. Consequently, choice may not

ameliorate inequality at all. Instead, choice may only conceal an underlying system of

inequality within schools. Students choosing to leave regular public schools for choice

schools may discover that the more things change, the more they stay the same.

Though peer reviewed research on choice is scant, extant research supports both

the market and the conflict model, but neither model appears to have unequivocal

support. For example, Chubb and Moe (1990) find that private schools are schools free

of the bureaucratic constraints that plague public schools. These schools are therefore

more "effectively" organized and in turn, have higher achievement, than regular public

high schools. Bryk, Lee, & Holland's research on Catholic schools also suggests that

Catholic schools are more effectively organized (i.e. more autonomy, more collegial

relations between staff, more rigorous expectations for students, more discipline, etc.)

than regular public schools. The organizational structure of Catholic schools, particularly

the academic organization and the lack of curricular differentiation is often identified as

the reason why Catholic school students outperform regular public school students.

Research on the relationship between choice and achievement, however, is

decidedly more mixed. Gamoran (1996) found that magnet schools were more effective

than regular public high schools at raising the proficiency of students in science, reading,

and social studies. Similarly, the choice program in New York City's East Harlem

distict is the model for choice success. Once known for their dismal levels of

performance, the district now rates among the best in New York City (Fliegel 1993; Kirp

1992). Yet, other research examining choice and achievement does not provide any clear

evidence in support of increased achievement among other kinds of choice schools, especially charter schools (NCES 2003a; Schneider, Teske, & Marschall 2000; Wells 2002; Witte 1993; 1996; 2000). Research on charter schools suggests that these students do not perform any better than students from similar race and income backgrounds in regular public schools. Similarly, though research on Catholic schools suggests that this form of choice generally increases overall achievement and reduces achievement gaps between racial and SES groups (Bryk et al 1993; Coleman & Hoffer 1987), research on voucher programs suggests that they do little to enhance the achievement of poor and minority students (Witte 1996; 2000).

While market models explain why choice schools might enhance achievement, conflict frames provide a suitable foil for explaining why choice schools might fail to increase achievement. Qualitative research within this framework suggests that minority and low-income students encounter low academic placements once they enter choice schools (Wells 1996; Wells, Holme, & Vasudeva 2002). In a case study of a California public high school turned wealthy upstart charter school, Wells and her colleagues (2000) found that advantaged parents exerted great effort in attempting to "manage" the school's curriculum and opposed de-tracking efforts aimed at increasing access to advanced material to all students. Though seemingly committed to diversity, these parents were intent on excluding minority transfer students from the most selective programs within the school. Similarly, Wells (1996) found that inner-city Black transfer students participating in St. Louis' city-to-suburb choice program often encountered low academic placements when they moved to predominantly White, suburban schools. Thus, choice may reify inequality rather than reduce it.

SUMMARY AND HYPOTHESES

In sum, the logic of market models suggest that moving to a system of choice will create a clientele for schools. Therefore, in order to survive, schools must organize more effectively in order to increase achievement and maintain a clientele of students and parents. Conflict models, on the other hand, propose that switching to a system of choice will not ameliorate inequality at all, but instead will shift inequalities that occur between-schools into within-school disparities. Given the mixed findings of previous research and the frames I use to conceptualize my research questions, I generate the following hypotheses:

Hypothesis 1 – Markets and Achievement: Choice (public and private choice) school attendance will increase achievement among poor and minority students.

Hypothesis 2 – Markets and Achievement: Enhanced school organization will improve achievement of poor and minority students.

Hypothesis 3– Conflict and Achievement: Choice (public and private choice) school attendance will not increase achievement among poor and minority students.

Hypothesis 4 – Markets and Track Placement/Academic Course-Taking: Poor and minority students will be more likely to end up in the academic track in choice (public and private choice) schools.

Hypothesis 5 – Markets and Track Placement/Academic Course-Taking: Poor and minority students will be more likely to end up in the academic track in organized schools.

Hypothesis 6 – Conflict and Track Placement/Academic Course-Taking: Poor and minority students will be less likely to end up in the academic track in choice (public and private choice) schools.

METHODS

Measures

Student-Level Measures

Achievement. While the previous analyses examined school-level gains in math achievement, I examine student-level 12th grade math achievement in this analysis. I use 12th grade math IRT score to measure achievement. As noted in Chapter Three, although I use gain scores in other parts of this study, the analytic strategy I use here (HLM) makes the use of gain scores problematic. The first step in an HLM analysis is to calculate the amount of variation in the dependent variable that occurs across schools. This statistic is known as the intraclass correlation (ICC). A gain score is the product of two variables - 12th grade achievement minus 10th grade achievement, the latter of which would otherwise be an independent variable. Including 10th grade achievement in the gain score literally subtracts variance from 12th grade achievement. While a miniscule 5% of the variance in the gain score occurs across schools, 25% of the variation in 12th grade achievement occurs across schools. The standard ICC to justify the use of HLM is 10%. Therefore I refrain from using a gain score as the dependent variable. Instead I use 12th grade achievement as the dependent variable and include 10th grade achievement as an independent variable on the right-side of the equation.[20]

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[20] I report the results of analyses using achievement *gain* as the dependent variable in the Appendix (Appendix Table 5.3) for this chapter.

Track/Curriculum Concentration. I use transcript-reported curriculum concentration to gauge the effects of school choice on student-level track placement. ELS constructed a variable from student course-taking patterns to gauge curriculum concentration. This variable differentiates between students whose course-taking patterns reflect a concentration in high level academic content, a concentration in a specific occupational or labor market area, a combination of academic and occupational concentrations, or some other pattern. In ELS, academic curriculum concentration is indicated by the following requirements: four credits of English, three credits of math with at least one credit higher than Algebra II, three credits of science, with at least one credit higher than biology, and three credits of social science with at least one credit in US or world history, and two credits in a single foreign language. An occupational curriculum concentration is defined as earning at least three credits in one specific labor market area. Labor market preparation areas include: Agricultural and Renewable Resources, Business, Marketing and Distribution, Health Care, Protective and Public Services, Trade and Industry, Technology and Communication, Personal and Other Services, Food Service and Hospitality, and Child Care Education. I dummy code this variable to reflect an academic concentration versus all other concentrations (academic=1, other=0).

Student-Level Controls and Independent Variables. I use 10th grade math IRT score to measure 10th grade achievement. I also include student-level SES, race, gender, and the propensity to attend a public school of choice and the propensity to attend a private school of choice. I discuss the latter two variables in more detail in the Analytic Strategy section entitled "Dealing with Selection Bias".

School-Level Measures

Choice. The primary independent variable in my analysis is school choice. I define school choice as enrollment at a public magnet school, other public school of choice or open enrollment school, Catholic school, or non-Catholic private school. Regular public schools serve as the primary point of comparison. I collapse school type and use dichotomous indicators of public choice and private choice options to make the following comparisons: 1) regular public schools to public schools of choice (magnet & other public schools of choice) 2) regular public schools versus private schools (Catholic, non-Catholic private).

School Organization. Because of the centrality of Chubb and Moe's (1990) work to the school choice debate, the variables I choose to represent school organization stem from their well-known work. Chubb and Moe identify four specific dimensions of school organization that influence the achievement of students: Leadership (the authority and autonomy of principals), personnel (characteristics specific to teachers that affect student achievement), practice (how programs are carried out, services provided, and children taught, i.e. the activities in a school related to education), and goals (the objectives schools aspire to meet). They develop an index of school organization based on these four dimensions using indicators obtained from High School and Beyond. I use a corresponding set of measures from ELS to approximate the indicators used by Chubb and Moe (See Chapter 3). I create a school organization index by standardizing each of the measures, averaging them, then standardizing the average. The mean of this scale is set to zero and standard deviation is set to one.

School SES and Racial Composition. School SES and racial composition are important to this analysis for a number of reasons.   First, school SES and school racial composition may be associated with school type. More specifically, descriptive results from Chapter Four indicate that magnet schools have much higher concentrations of minority students. Furthermore, choice schools in general appear to have more students from the lower ends of the SES distribution (see Chapter Four Table 4.3). Second, these variables are often proxies for financial and pedagogical resources, and therefore affect achievement indirectly. Moreover, previous research demonstrates that both characteristics tend to affect student performance and track placement/course-taking (Braddock 1990; Davis, Rauscher, & Werum 2005; Lucas and Berends 2007; 2002). Hence, it is necessary to account for these attributes.

At the school level, I use the aggregate of 10th grade student-level SES to measure school SES. This is a commonly used indicator to gauge school SES. Although the percentage of students on free lunch is also typically used to assess school SES, this indicator proves problematic when trying to draw inferences about private schools, since these schools typically enroll, few if any students living at or below the poverty line. Since private schools are included in this analysis, the aggregate measure is a more precise way of gauging school-level SES.

I measure school racial composition using the percentage of minority students in each school. ELS includes this data for three school years, 2000-2001, 2001-2002, and 2002-2003. In order to establish temporal precedence, I use data from the 2001-2002 school year. This variable runs concurrent with other base year data from ELS.

Analytic Strategy

Dealing with Selection Bias. In addressing questions that pertain to student-level

outcomes, I employ analytic techniques to deal with selection bias. Selection bias is

often a problem when attempting to assess the effects of schools on students. More

specifically, students may have characteristics that influence both their propensity to

attend certain types of schools and also influence their achievement. For example,

research suggests that students with more involved parents are more likely to attend

choice schools (Martinez, Godwin, & Kremer 1996; Wells 1996). Higher income

students are more likely to attend expensive private schools. Increased levels of parental

involvement and high SES are, in turn, also related to higher achievement. Thus, it may

not be that choice schooling increases achievement. Rather, high-achieving students

attend and enroll in choice schools.

To account for this kind selection bias, I generate propensity scores to control for

the likelihood of attending a choice school. Generating propensity scores falls short of a

more experimentally-based method known as propensity score matching. Propensity

score matching approximates the kind of randomized assignment often used in

experimental studies, making it a useful technique for drawing causal inferences.

Essentially, the technique allows researchers to randomly assign students to treatment (in

this case, attending a choice school) and control groups (regular public schools). Because

students are "randomly" assigned to choice and regular public school groups,

spuriousness resulting from selection bias is reduced.

Propensity score matching works in the following manner: First, characteristics

associated with receiving the treatment, in this case, choice school attendance, are

identified. Next, these characteristics, or matching covariates as they are known, are included in a logistic regression model. Using the combined set of characteristics, the regression model estimates the probability of attending a choice school. Students with similar probabilities are matched and then randomly assigned to a "treatment" or "control" group. After assignment to a group, regression techniques can be used to estimate the effect of attending a choice school on individual achievement and tracking.

Though it is widely considered to reduce selection bias, in practice, propensity score matching is often a difficult feat to accomplish. The data at hand presented a number of dilemmas that made using propensity score matching as a technique to reduce selection bias less than prudent. First, obtaining a sufficient number of matching covariates that occur prior to the treatment proved difficult within ELS. Typically, matching covariates occur temporally prior to the treatment. The exception to this rule involves covariates that cannot be affected by the treatment, for example, race or gender, that remain constant over time (Harding 2003). This rule is particularly applicable to selection bias in school choice assessments, since some characteristics, like parental involvement in school, are likely to be influenced by choice school attendance. For example, parents may become more involved if parental involvement is encouraged at a choice school than at a regular private school. Moreover, others argue that in order to establish causation, temporal precedence is a necessity (Stinchcombe 1987). Therefore, variables hypothesized to predict selection into the treatment group must occur prior to and not contemporaneous with the treatment. Selecting variables that occur during the treatment period potentially biases the treatment effect (Harding 2003; Rosenbaum 1984).

However, ELS assesses students at 10th and 12th grade, after they have already

entered a choice school. This creates a dilemma when trying to choose matching

covariates. In addition to difficulty finding matching covariates that occur temporally

prior to the treatment, attempts to reduce selection bias were further complicated by the

inability to achieve appropriate balance between the treatment and control group.

Balance between the treatment and control groups is achieved when observations with the

same propensity score have the same distribution (means) of observable (and

theoretically unobservable) characteristics independent of treatment status (Becker &

Ichino 2002). Thus, in order to circumvent this predicament I use the propensity score

generated after the logistic regression as a control, rather than trying to randomly assign

(i.e. matching) students.

I include all basic and relevant time-invariant characteristics like race, school

urbanicity, and other characteristics, like SES, that are unlikely to vary across the time

period under study. I also add a small set of parental involvement indicators that occur

simultaneously with the treatment. The final set of covariates used to control for the

likelihood of attending a choice school included the following variables: race, SES,

number of siblings, family composition, school urbanicity, region, parental membership

in the school's parent-teacher association (PTA), and the frequency with which parents

attended religious services with their children. Since the propensities may differ by

sector, I create *two* different propensity scores – one propensity score that accounts for

the likelihood of attending a *public* school of choice and a second propensity score that

accounts for the likelihood of attending a *private* school of choice. I conduct two

regression analyses, one to generate a public choice propensity score and a second to

generate a private choice propensity score. I include both propensity scores in my analytic models as controls.

HLM. Hierarchical Linear Modeling (HLM) analysis is another advanced technique that is potentially useful given the multilevel nature of the data at hand. This analysis addresses two major questions. First, to what extent does choice affect the relationship between race/SES-tracking (i.e. inequality in tracking) and race/SES-achievement (i.e. inequality in achievement)? Second, to what extent do other school-level characteristics, like racial and SES composition, affect the relationship between race/SES-tracking and race/SES-achievement? Whereas the analyses in previous chapters focused on the effects of school level-characteristics on other school-level characteristics, this analysis will focus on the effects of school-level characteristics on student-level outcomes.

HLM is useful for a number of reasons. First, when making assessments across organizations, HLM estimators are typically more efficient. This is because standard regression analyses fail to take into account the fact that students are clustered within schools and share common educational experiences. As a result, student outcome measures are not completely independent from one another. Ordinary least squares regression (OLS) analyses assume that observations are independent, and because this assumption is violated, OLS regression produces standard error estimates that are too small. HLM takes this clustering into account, and typically produces larger error estimates. A second use of HLM is to formulate tests regarding how variables at one level affect the relationship between variables measured at another level (Raudenbush & Bryk 2002). In this case, HLM provides a framework to analyze the effects of choice on the student race/SES-tracking relationship. Here, we may see that choice intensifies or

attenuates the relationship between individual race/SES and achievement. HLM can estimate a slope, the relationship between race and achievement, for example, as an outcome. This technique permits me to determine if the relationship between race/SES and student tracking is stronger or weaker in choice schools compared to non-choice schools. Third, HLM also provides auxiliary statistics that parcel out the variance in the dependent variable that occurs across schools. In this case, HLM tells us how much of the variance in math achievement occurs between schools.

For the purposes of this analysis, I use HLM to obtain estimates for various cross-level interactions involving the effects of school choice on student-level outcomes. In particular, I use HLM to estimate the effects of choice on the race/SES achievement relationship and the race/SES-tracking relationship. The within school, or level 1, model for tracking and achievement regresses achievement and track position for student i in school j as a function of race, SES, and prior achievement. Each model appears as follows:

12th GRADE MATH ACHIEVEMENT$= B_{j0} + B_{j1}$ (PRIORACH) $_{ij} + B_{j2}$ (SES) $_{ij} + B_{j3}$ (BLACK) $_{ij} + B_{j4}$ (LATINO) $_{ij} + B_{j5}$ (ASIAN/PI) $_{ij} + B_{j6}$ (GENDER) $_{ij} + B_{j7}$ (PROPENSTIY PUBLIC) $_{ij} + B_{j8}$ (PROPENSITY PRIVATE) $_{ij} + e_{ij}$

TRACK$= B_{j0\,(m)} + B_{j1\,(m)} *$ (PRIORACH) $_{ij} + B_{j2\,(m)} *$ (SES) $_{ij} + + B_{j3\,(m)} *$ (BLACK) $_{ij} + B_{j4\,(m)} *$ (LATINO) $_{ij} + B_{j5\,(m)} *$ (ASIAN/PI) $_{ij} + B_{j6\,(m)} *$ (GENDER) $_{ij} + B_{j7\,(m)} *$ (PROPENSITY PUBLIC) $_{ij} + B_{j8\,(m)} *$ (PROPENSITY PRIVATE) $_{ij} + e_{ij}$

Each parameter is interpreted in the following manner:

$B_{j0} =$ Mean achievement/track for students in school j.

B_{j1} = The degree to which initial differences in achievement result in track/achievement differences between students.

B_{j2} = The degree to which differences in the social class relate to tracking/achievement between the track/achievement of students.

B_{j3} = The mean difference between the achievement/track of White students and Black students

B_{j4} = The mean difference between the achievement/track of White students and Latino students.

B_{j5} = The mean difference between the track/achievement of White students and Asian/Pacific Islander students.

B_{j6} = The mean difference between the track/achievement of male and female students.

One can think of level-1 model as a simple regression equation. The between-school, or level-2 model, estimates the intercept and slopes of the previous equations as outcomes, or more simply, dependent variables. This model appears as:

$B_{j0} = \gamma_{00} + \gamma_{01}$ (% MINORITY) $+ \gamma_{02}$ (SCHOOL SES) $+ \gamma_{03}$ (PUBLIC CHOICE)$_j + \gamma_{04}$ (PRIVATE CHOICE) $+ \gamma_{05}$ (SCHOOL ORGANIZATION) $+ \mu$

$B_{j1} = \gamma_{10} + \gamma_{11} + $ (% MINORITY) $+ \gamma_{12}$ (SCHOOL SES) $_+ \gamma_{13}$ (PUBLIC CHOICE)$_j + \gamma_{14}$ (PRIVATE CHOICE) $+ \gamma_{15}$ (SCHOOL ORGANIZATION) $+ \mu$

$B_{j2} = \gamma_{20} + \gamma_{21} + $ (% MINORITY) $+ \gamma_{22}$ (SCHOOL SES) $+ \gamma_{23}$ (PUBLIC CHOICE)$_j + \gamma_{24}$ (PRIVATE CHOICE) $+ \gamma_{25}$ (SCHOOL ORGANIZATION) $+ \mu$

$B_{j3} = \gamma_{30} + \gamma_{31}$ (% MINORITY) $+ \gamma_{32}$ (SCHOOL SES) $+ \gamma_{33}$ (PUBLIC CHOICE)$_j + \gamma_{34}$ (PRIVATE CHOICE) $+ \gamma_{35}$ (SCHOOL ORGANIZATION) $+ \mu$

$B_{j4} = \gamma_{40} + \gamma_{41}$ (% MINORITY) $+ \gamma_{42}$ (SCHOOL SES) $+ \gamma_{43}$ (PUBLIC CHOICE)$_j + \gamma_{44}$

(PRIVATE CHOICE) + γ_{45} (SCHOOL ORGANIZATION) + μ

$B_{j5} = \gamma_{50} + \gamma_{51}$ (% MINORITY) + γ_{52} (SCHOOL SES) + γ_{53} (PUBLIC CHOICE) $_j$ + γ_{54}

(PRIVATE CHOICE) + γ_{55} (SCHOOL ORGANIZATION) + μ

Let me explain how to interpret these coefficients. HLM coefficients can be divided into two types: intercepts and slopes. With the exception of the "base" intercept, intercepts can be interpreted just like regular regression coefficients. The "base" intercept is the overall mean on the outcome for the entire sample. The base intercept is symbolized here by γ_{00}, and it represents mean math achievement/track position for the average student in school j. At level-2, we estimate the effects of school-level variables on B_{j0}. In this case, the coefficient for γ_{01} represents the effect of school choice on mean math achievement/track position of student i in school j. The intercept for each student-level predictor, can be interpreted as a regular regression coefficient would be. For example, a significant intercept for a continuous variable like SES, represented here by $\gamma_{20,}$ means that higher SES students have higher levels of achievement. Similarly, a significant intercept for a dummy-coded variable, Latino for example, would suggest that Latino students have higher levels of achievement than the omitted category, Whites.

Slopes, however, represent the effect of a level-2 variable (here a school-level variable) on the relationship between the outcome and a student-level predictor. The level-1 slope term, $B_{j2,}$ which represents the effect of SES on achievement, becomes an outcome at level-2. The slope terms for B_{j2}, represented here by γ_{21} through $\gamma_{25,}$ denotes the effect of each school-level variable on each student-level relationship - literally the regression line between a student-level covariate and the outcome. These effects are typically known as cross-level effects in HLM. A positive slope coefficient indicates that

the relationship between the SES and achievement gain is intensified (the slope of the

regression line is steeper). A negative slope coefficient implies that the relationship

between the student-level predictor and the outcome is attenuated (the regression slope is

less steep). For example, the coefficient for γ_{23} represents the effect of public school

choice on the SES-achievement relationship. Again, we might see one of two things

here: choice might be associated with either an *attenuation* or an *increase* in the SES/race

gap in achievement. I use a fixed (versus random) effects model and do not allow slopes

to vary across schools. A random effect model suggests that the slopes or the relation

between each level-1 variable and the outcome (ex. SES and achievement) varies across

schools. For example, a random effect model might examine the relationship between

SES and achievement and find this relationship to be stronger in high SES schools.[21]

My HLM analyses are complicated by one data dilemma and its concomitant

solution − multiple imputations for missing data at the school level. Because of missing

data at the school-level and the imputation procedure I use to fill-in missing values, I

conduct *five* different HLM analyses for any single HLM question that I attempt to

answer. Unlike other statistical programs, HLM does not combine the results of multiply

imputed data sets. Since I impute five data sets, I also conduct five HLM analyses for

each dependent variable. Thus, I conduct a single HLM analysis for each data set, then

average the results using the following formulas:

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[21] Preliminary random effects models indicate that there is no significant variation in intercepts or slopes across schools. I tested the random effects for each level-1 relationship. None of the random terms reached statistical significance, so I exclude the random term from the final model.

Regression Coefficient

$$\bar{q} = \frac{1}{m} \sum_{j=1}^{m} q_j \, ,$$

Where $\bar{q}$ is the average of m separate estimates, q_j (j=1, . . ., m).

Standard Error

$$\sqrt{SE(q)^2} = \frac{1}{m} \sum_{j=1}^{m} SE(q_j)^2 + S_q^2(1 + 1/m).$$

  This formula can also be expressed as separate within and between imputation variance

estimates. The within imputation variance can be expressed as

$$\bar{U} = \frac{1}{m} \sum_{j=1}^{m} U_j \, ,$$

where U is the variance from the jth imputed data set and m is the number of imputations.

This is essentially the average variance of each individual regression coefficient from the

five regressions. The between imputation variance can be expressed as

$$B = \frac{1}{m-1} \sum_{j=1}^{m} (\hat{q} - \bar{q})^2 \, ,$$

where m is the number of imputations, $\hat{q}$ is the parameter estimate from the jth imputed

data set and $\bar{q}$ is the mean parameter. The total variance is a function of the within and

between-variance estimates and can be expressed as

$$T = \bar{U} + (1 + \frac{1}{m})B \, .$$

The square root of the total variance constitutes the standard error of the parameter

estimate.

RESULTS

Does choice attenuate or intensify the relationship between student-level race/SES and achievement?

Tables 5.1 and 5.2 show the student-level descriptive statistics for math IRT achievement gains between 10th and 12th grade by race and school type and by SES quartile and school type respectively. Again, gains are more reflective of what occurs in schools (i.e. learning). (For 10th and 12th grade scores, see table A5.1 and A5.2). Looking within school type but across ethnicity, Asian students have the highest gains in math scores. Whites and Latinos trail closely behind, followed by Blacks. Although there are slight differences between Blacks, Whites, and Latinos, these differences do not appear to be large. Across school type, students in Catholic and private schools experience the greatest gains. However, looking within SES quartile and between schools, it appears that students in public schools of choice have lower scores than their regular public school counterparts in some cases. This appears to especially be the case for students in the lowest SES quartile in other public schools of choice.

(Insert Table 5.1 about here)

(Insert Table 5.2 about here)

The student-level means presented in Tables 5.1 and 5.2 appear to suggest that choice may affect academic outcomes for students. I now turn to HLM estimates. Again, these estimates permit me to examine the effects of school-level variables on student-level outcomes, while controlling for the effects of within-school clustering on standard errors. The first step in an HLM analysis with a continuous outcome is to partition the variability in the outcome. This model excludes all predictors. In a 2-level HLM model

with school as the level-2 variable, the unconditional model partitions the variance in outcomes into between school components. More specifically, the unconditional model tells us how much of the variance in the outcome, in this case, math achievement, occurs between schools. Approximately 25% of the variance in math achievement occurs across schools.

The second step in an HLM model is to specify the student-level predictors to be included in the analysis. I construct parsimonious models and include six student-level predictors: prior achievement, SES, race, gender and propensity to attend a public choice school and a private choice school. The level-1 equation models achievement as a function of student-level SES, prior achievement, race, gender, and propensity to attend a choice school; the level-2 model adds minority and SES composition, along with school-level choice option (public as well as private choice) and organization to the equation.

Table 5.3 presents the estimates of HLM models with 12th grade math achievement as the dependent variable. Let me discuss the intercepts first. Again, intercepts can be treated like regular regression coefficients. An examination of the intercepts reveals that students with higher 10th grade math scores tend to have higher 12th grade math scores. This is evident by the positive coefficient for 10th grade math intercept (.98). The HLM estimates also show that higher SES students have higher achievement scores. For every unit increase in SES, achievement increases by half a point (.53). A look at the intercepts also reveals that Blacks and Latinos have lower 12th grade scores than Whites; Black students score almost 1 point lower than White students (-1.01) and Latino students score a little over three quarters of a point lower than White students (-.92). Both differences are marginally significant. Asian students score one

and a third points more than Whites. Female students score half a point less than male students.

The intercepts suggest that students from high SES backgrounds, students with high 10th grade math scores, and White, Asian, and male students have the highest math scores. I now turn to the cross-level effects in Table 5.3. Cross-level effects specify how the school-level variables in the analysis affect the relationship between student-level predictors and the outcome (in this case, 12th grade math achievement). Here we might see that a school-level variable like public choice may widen or shrink the gap between SES and achievement for example. Negative coefficients indicate that school-level variables attenuate or reduce the gap; positive coefficients indicate that school-level variables are associated with an increased gap. School SES and the percentage of minority students have few effects on the student-level predictors and 12th grade math achievement. In the base model, the effect of school SES on overall mean 12th grade achievement is large – for every unit increase in school SES, student scores increase by 12 points. The percentage of minority students has a negative and significant influence on mean math achievement (-.05). However, with the exception of the base model, the effects of school SES and the percentage of minority students are minor – they fail to reach significance in any other part of the model.

Table 5.3 reveals that school organization has some significant effects on student-level achievement. In the base model, school organization appears to have a positive and significant effect on overall mean math achievement. This means that students in "more organized" schools have higher math achievement scores. This finding is consistent with the market model which suggests that better organized schools have higher achieving

students. Furthermore, school organization appears to reduce the gap in achievement between students with high 10th grade math scores and students with low 10th grade math scores.

Table 5.3 also shows that public schools of choice and private schools reduce the gap in achievement between students with high and low 10th grade scores. This is evident by the negative effect on public choice on 10th grade math scores (-.02 and .04 respectively). On the other hand, we see that public choice as well as private options *enhance* the effect of SES on achievement. More specifically, this result suggests that choice *intensifies* the effect of SES on achievement. In regular public schools, for every unit increase in SES, math achievement scores increase by .53 points. However, in public schools of choice, math achievement scores increase by 1.50 points for every unit increase in SES. The effect is similar, though not as strong in Catholic and non-Catholic private schools. In these schools, for every unit increase in SES, math scores increase by 1.04 points. Therefore, rather than reducing the SES gap in achievement, choice schooling seems to increase the gap. Figure 5.1 graphically displays the SES difference between regular public schools, private schools, and public schools of choice. In Figure 5.1, the thin line represents the relationship between SES and achievement in regular public high schools, the medium line represents the relationship between SES and achievement in private schools, while the heavy line symbolizes the relationship between SES and achievement in public high schools of choice. The relation between SES and achievement is steeper in choice schools, suggesting that choice amplifies the effect of SES on achievement.[22] [23]

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[22] In analyses not discussed here, I control for the possibility that a wider SES distribution in choice schools accounts for the wider SES gap in achievement. The results of these analyses suggest that the SES gap in

(Insert Table 5.3 here)

(Insert Figure 5.1 here)

Surprisingly, there are no significant cross-level race/choice effects. Though choice enhances the effect of SES on math scores, choice has no significant effect on the relationship between race and achievement. Furthermore, though choice appears to reduce the achievement gap between Blacks/Latinos and Whites, this effect is not significant.

Overall, the HLM estimates suggest that there is only slight variation in achievement between racial groups in choice schools, while there is significant variation in achievement along SES lines in choice schools. I turn to an additional set of HLM analyses to determine if tracking potentially motivates this disparity.

Does choice attenuate or intensify the relationship between student-level race/SES and tracking?

Table 5.3 suggested that public and private choice options increased the SES gap in math achievement. I now turn to analyses which seek to determine if track placement is driving this effect. Figures 5.2 and 5.3 display the distribution of students in the academic track and in other curriculum concentrations by race and school type and SES and school type respectively. Overall, it appears that students are clustered in other curriculum concentrations rather than the academic track/concentration. Looking across race but within school type in Figure 5.2, we see that students from all racial groups

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achievement cannot be attributed to a increased variation in SES in choice schools, as the effect of public choice on the SES-achievement relation remains strong in analyses which include the standard deviation of school SES (See Appendix 5.8)

[23] In analyses not presented here I include a race x class interaction term to determine if the effect of class varies by race and vice versa. None of these interactions were significant, therefore I do not include them here.

appear to be clustered in other curriculum concentrations in all public schools.

Moreover, the proportion of students in the academic track within each racial group does not appear to vary across racial groups. That is, it appears that no racial groups are disproportionately represented in any track given their total representation in each school. However, the ratio of students in the academic track versus students in other curriculum concentrations is more balanced in Catholic and non-Catholic private schools than in public schools.

In Figure 5.3, the pattern is similar. Students in all SES quartiles are more likely to be in other curriculum concentrations in all public schools. Again, the trend is more balanced in Catholic and non-Catholic private schools. Although there appear to be no students from the lowest SES quartile in the academic track in non-Catholic private schools, this can be attributed to their small overall level of representation in these schools (n<100).

Table 5.4 displays the results of HLM analyses assessing the effects of school contextual factors, including school choice and organization, on the relationship between curriculum concentration and student-level predictors. The level-1 equation models achievement as a function of student-level SES, prior achievement, race, gender, and propensity to attend a choice school; the level-2 model adds 5 school-level predictors: percent minority, percentage of students in the academic track, school SES, choice option (public as well as private choice) and school organization to the equation.[24]

First, looking at the base model, it appears that all students are significantly less likely to be in the academic track (-2.03). This finding is consistent with the descriptive

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[24] Since I am not concerned with gender inequity in schools or how and differences in propensity to attend a choice schools affects inequality within a choice school, I do not model assess the effect of the level-2 variables on these student-level predictors. I include them only as controls.

results seen in Figures 5.2 and 5.3. The results show that there are no significant differences in track placement between students in public schools of choice and regular public schools. However, students in private schools appear more likely to be in the academic track. This corroborates previous literature, which suggests that students in private schools are more likely to take academically oriented courses simply because there is less curriculum differentiation in these schools (Bryk, Lee, and Holland 1993; Coleman and Hoffer 1987; Lee et al 1998). Turning to the intercepts, it appears that the likelihood of being placed in the academic track increases as 10th grade math scores increase. Similarly, higher SES students are significantly more likely to be in the academic track than lower SES students. After controlling for SES and base year scores, Black, Latino, Asian, and female students are also more likely to be in the academic track than White and male students. This is also consistent with previous literature, which has found that female and minority students may have a placement advantage once other factors are controlled (Gamoran and Mare 1989; Garet and Delany 1988; Lucas 1999).

With regard to cross-level effects, while public choice options have no significant effect on the SES-track or race-track slopes, private choice has a negative effect on the SES-track slope. This suggests that the likelihood of being placed in the academic track is *attenuated* for high SES students in private schools of choice. Although the public choice finding implies that tracking may not be the mechanism fueling SES-based inequality within choice schools, the private school finding appears to suggest that there is more equity and less inequality in track placement in private schools. Thus, though choice may in part reduce SES-based inequality in tracking, it seems that this does not lead to increased achievement on the part of students from lower SES backgrounds.

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Again, this is consistent with previous literature which suggests that private schools reduce curricular differentiation and thereby place more students in the academic track (Bryk, Lee, & Holland 1993; Coleman and Hoffer 1987).

<div align="center">(Insert Figure 5.2 about here)</div>

<div align="center">(Insert Table 5.4 about here)</div>

If not tracking, then what?

The finding that student-level track placement, at least at it is defined here, does not significantly differ across regular public schools and public schools of choice, and in turn, does not account for the increased SES gap in achievement in public schools of choice raises an important question. If not tracking, then what explains increased SES gap in achievement? That is, if track placement, or more precisely, transcript reported curriculum concentration does not explain the difference in the SES gap in achievement between regular public schools and public schools of choice, then what accounts for this difference? One argument is that curriculum concentration, at least as it is operationalized here, may not capture the differences in exposure to high level academic content. An academic curriculum concentration as it is defined in ELS entails having taken a relatively basic set of core courses. For instance, there may be stark differences between students who take four years of English if those students take college prep English versus general high school English. Thus, it is possible that the academic/other dichotomy does not sufficiently distinguish between students who took _high-level academically oriented_ courses and students who merely took _academically oriented courses_. Advanced Placement (AP) and IB (International Baccalaureate) courses offer an

alternative means of assessing differences in advanced course-taking. The next set of

analyses examine this issue empirically.

The College Board, under the auspices of the Educational Testing Service,

sponsors the AP program. The AP program is described in the following way:

> The College Board partners with colleges and universities to create assessments
> of college-level learning—the AP Exams—in 37 subject areas. The College
> Board then supports secondary schools in training teachers and developing a
> curriculum of high academic intensity and quality that will enable students to
> meet the standards for college-level learning in these subjects. As a result, most
> colleges and universities in the United States, as well as institutions in more than
> 30 other countries, use AP Exam results in the admissions process as a
> designation of a student's ability to succeed in rigorous curricula, and also award
> college credit or placement into higher-level college courses so that college
> entrants can move directly into the courses that match their level of academic
> preparation for college (p.1, Advanced Placement Report to the Nation 2007).

As the description above notes, AP courses are distinct from regular college-level track

courses in that they expose students to material that "meets the standards for college-level

learning". Moreover, at the end of the course, students have the option of taking an exam

for which they can earn college credit. Scores on the exam range from 1 to 5, and

colleges typically award students who earn scores of 3 and above credit for a course in

college. As one journalist notes, "AP courses are not just college-prep courses, they *are*

college courses" (Matthews 2007), or at the least the closest high school approximation.

Like AP courses, IB courses are also rigorous and demanding. However, the IB

program differs from AP in that they are sponsored by different organizations and have

different curricula. While the AP program is a US based program sponsored by the

College Board, the IB program is a European-based program sponsored by the

International Baccalaureate Organization located in Cardiff, Wales. Moreover, the IB

curriculum emphasizes writing across the curriculum and students complete writing

assignments and research papers in all classes, including math and science (Wells 1993).

IB assessments encourage an international outlook and intercultural skills where appropriate. Finally, students in IB programs can pursue a 1 or 2 year course of study where they receive an IB certificate or diploma respectively at the conclusion of the course(s). IB diplomas require participation in what the program calls CAS - creativity, action, and service. Colleges also award credit for IB courses as they do for AP courses, though specific schools vary to the extent they give credit for either. Consequently, given the intensity and rigor of AP and IB courses, using AP/IB course-taking as an indicator of curriculum prestige may be a better way to determine if the gap in math achievement is created by differences in AP course-taking rather than over-arching track placement.

However, using an AP/IB course-taking approach to "track placement" may be prudent for another reason. Recent research (Lucas 1999) suggests that course-based approaches to understanding stratification within schools may be more meaningful. According to Lucas, schools began dismantling formal or "overarching" tracking programs in the mid 1970s. In an overarching program, students were assigned broadly to the same level of courses in different subjects. A student in the general track would take general math, general English, etc. This form of course-taking had fallen out of fashion by the 1980s and was replaced with a course-by-course form of tracking.

Consequently, examining the effects of choice on AP/IB course-taking may be useful for two reasons. First, curriculum concentration as it is defined in ELS may be too general an approach to understanding differences in exposure to high level academic content. Similarly, curriculum concentration mirrors the over-arching form of course assignment described by Lucas (1999). In contrast, AP course-taking reflects a more

course-based approach to course assignment. I use a variable indicating the total number of AP courses a student took to determine how school choice affects the relationship between race/SES and AP course-taking.[25] Although I am trying to determine if advanced course assignment/track placement mediates the effect of choice on the SES-math achievement relationship, the total number of AP courses might be relevant for math achievement, since previous research suggests that students with high levels of achievement in math have a higher probability of being in advanced English courses than students with high levels of achievement in English (Lucas 1999). Still, given the emphasis on transcript reported course-taking, there is one important methodological point here. In ELS, AP/IB course-taking is measured in Carnegie units. One Carnegie unit is equivalent to one course taken one period a day for five days a week for a full school year. Carnegie units are standardized course credits; they facilitate comparison across schools (NCES 2007a). The higher the number of Carnegie units, the more exposure a student has had to advanced content.

Tables 5.5 and 5.6 show descriptive statistics for total AP/IB course taking by race and SES quartile and school type. A quick glance at the means shows that Asian students take more AP/IB courses than their counterparts from other races. Students in the highest SES quartile appear to take more AP/IB courses as well. Across school type, it appears that magnet school students take the most AP/IB courses, followed by Catholic and private school students. However, the magnet school advantage in this respect is countered by the fact that students in other public schools of choice take the fewest AP/IB courses.

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[25] I also conducted tests using total number of math AP courses in addition to total number of AP courses. I report these results in Appendix 5.6.

(Insert Table 5.5 about here)

(Insert Table 5.6 about here)

Table 5.7 displays the results of HLM analyses on total AP/IB courses as a function of various student and school-level characteristics. The intercepts reveal that AP/IB course-taking increases as 10th grade math scores and SES increases. The intercepts also reveal that Latino and Asian students take more AP courses than White students and that female students take more AP/IB courses than male students.

Few of the school-level characteristics significantly affect the relationship between the student-level predictors and AP/IB course-taking. School SES appears to increase certain course-taking gaps. School SES increases the gap in AP/IB course-taking between students with high 10th grade math scores and students with low scores, between low and high SES students, between Black and White students and Asian and White students. However, both Asian and Black students appear to take more AP/IB courses than White students (Black students do not take significantly more AP/IB courses than Whites while Asian students do), therefore this gap is even larger in high SES schools.

Table 5.7 reveals that public choice does not affect the advanced course-taking of lower SES students. Although the intercept for SES suggests that high SES students are more likely to take more AP/IB courses, there is no significant cross-level effect of public choice on the SES-total AP relationship. However, private choice does have a significant negative effect on the SES-total AP relationship. These results mirror those seen in the analyses for curriculum concentration, indicating that private schools of choice reduce the SES gap in AP/IB course-taking. In other words, lower SES students in Catholic and

private schools take more AP/IB courses than their counterparts in regular public schools. That is, in regular public schools, for every unit increases in SES, students have .21 more Carnegie units in AP/IB courses. In public schools of choice, this increases to .27 Carnegie units for every unit increase in SES. However, in Catholic and private schools, students have only .11 more Carnegie units in AP/IB courses for every unit increase in SES. Therefore, compared to regular public schools, private schools reduce the SES gap in advanced course-taking. This finding is consistent with previous research which shows that some private schools, especially Catholic schools, (Bryk, Lee, & Holland 1993; Coleman, Hoffer, and Kilgore 1982; Coleman and Hoffer 1987; Lee et al 1998) reduce race and class-based gaps in track placement and advanced course-taking.

With regard to race, while Latino and Asian students take more AP/IB courses than White students overall, public choice appears to <u>reduce</u> the number of AP/IB courses these students take. This effect is significant for Latino students, but not for Asian students. In regular public schools, Latino students have .31 more Carnegie units in AP/IB courses than White students, while in public schools of choice Latino students have only .09 more Carnegie units in AP/IB courses than White students. Private choice appears to reduce AP/IB course-taking of Asian students. In regular public schools, Asian students take one AP/IB course than White students (.99 Carnegie units), but this is reduced to .60 units in private schools. Again, after all other factors are controlled, there was no significant difference between Black and White students in AP/IB course-taking.

(Insert Table 5.7 about here)

DISCUSSION

This chapter set out to determine how attending a public or private school of choice affected race and SES-based equity in achievement and track placement. The results suggest that public choice options *widen* SES-based gaps in achievement and potentially widen race-based gaps in course-taking. Though these findings are not surprising, they remain interesting nonetheless, since a major motivation compelling school choice reform is a desire to diminish race and class inequality in achievement. Instead, public choice may do more harm than good.

Private choice options also appeared to have a slightly larger SES gap in achievement than regular public schools, though the SES differences in track placement and advanced course-taking were smaller in private schools than public schools of choice. Though previous research has found that Catholic schools tend to reduce race and class-based gaps in achievement and advanced course-taking (Bryk, Lee and Holland 1993; Coleman, Hoffer, and Kilgore 1982; Coleman and Hoffer 1987), this research also finds that non-Catholic private schools do not have this leveling effect (Lee et al 1998).

It should be noted that the SES finding presented here is extremely robust and remains strong in the face of model manipulation. The inclusion of propensity scores in particular suggests that these estimates are quite conservative. Adding propensity scores to the models essentially means that some student-level characteristics are included in the HLM equation twice. For example, race and SES, both student-level independent variables, are also included in the propensity score. Thus, including the propensity scores in this manner may result in an *underestimation* of the effects of SES and race on achievement and course-taking. When propensity scores are excluded from the analysis,

the SES gap in math achievement in public choice schools is even larger (See Table A5.7).

The inclusion of propensity scores notwithstanding, it appears that the race-based gaps in achievement and track placement/course-taking that disadvantage minority students are nonexistent or marginal. Given the relative absence of sizeable race-based gaps here, there was little opportunity for choice to make a meaningful impact. There were no significant race-based disparities in track placement and course-taking that initially disadvantaged minority students. In fact, Latino and Asian students took more AP/IB courses than White students, and there was no significant difference in the track placement and AP/IB course-taking of Black and White students. However, public choice significantly reduced the number of AP/IB courses taken by Latino students. Here again, we see that choice may be problematic in this respect, since public choice was associated with a reduction in the number of AP courses Latino students took.

In terms of policy implications, the results suggest that public choice may do more harm than good, while the private sector alternative may be useful in reducing some SES-based disparities in academic outcomes. Though the findings presented here make private school vouchers seem slightly more appealing than public choice options, it is worth noting that reforms which shift the focus to private sector alternatives are by design limited in what they can achieve. As of 2007, 90% of all American students attended public schools, and doubling the size of the private sector would still leave approximately 80% of all students in public schools (Fliegel 1993; NCES 2007b). Thus, although private schools may help those students who need it most, vouchers are not a feasible means of *substantially* reducing the educational disparities that exist in the US.

Furthermore, policymakers should also consider the politics of choice, since they are often the politics of diversity. That is, even small-scale reform in the form of vouchers will increase diversity in private schools. This said, how willing are private schools to admit culturally and economically dissimilar students? And to what degree? Catholic schools have historically done better than non-Catholic private schools in both regards (Coleman, Hoffer, Kilgore 1982; Yun and Reardon 2005), but anecdotal evidence suggests that many inner-city Catholic schools, particularly those located in close proximity to students looking for alternatives to failing public schools, are already closing their doors in response to changing demographics. Many of these Catholic schools have seen their former economic base of more advantaged White families who could afford to pay higher tuition rates fleeing the cities and neighborhoods they once served, leaving behind a cadre of poor and minority families who cannot afford the full cost of tuition in many instances (Bryk, Lee, and Holland 1993; Patterson 2008; Santos 2008). Thus, though public choice may not reduce race and class-based educational disparity, the feasibility of even moderate reform in the form vouchers make the choice issue and the prospects of resolving the problems in American education in the absence of radical reform quite bleak.

CHAPTER SIX

MARKET VERSUS CONFLICT: SCHOOL CHOICE, DIVERSITY, AND

TRACK PLACEMENT

In the previous chapters I attempted to determine whether school choice affected achievement at both the school and student level. In Chapter Four I demonstrated that private choice options had positive and significant effects on school organization and school-level math achievement gains, even after controlling for school SES and prior achievement levels. In Chapter Five I showed that public schools of choice as well as private schools *increased* the SES gap in student-level math achievement. While I hypothesized that the mechanism promoting these gaps in achievement would be track placement/course-taking, there was no attendant SES gap in track placement or AP/IB course-taking in public schools of choice, though attending a public school of choice was associated with a significant reduction in the advanced course-taking of Latino students. However, private choice options diminished the SES gap in track placement and advanced course-taking. Furthermore, race-based gaps in student-level math achievement proved to be small. These findings suggest that public schools of choice may create new dilemmas, intensifying the very inequalities they were designed to reduce.

Although the findings of Chapter Five suggest that differences in track placement and advanced course-taking could not account for the SES gap in achievement in public schools of choice, this chapter examines this issue in greater detail and takes the previous analysis a step further. In particular, I attempt to determine if school-level *racial and economic diversity mediate* the relationship between choice, tracking, and achievement.

In doing so, I explicitly test the validity of the two competing theories I use to frame the school choice argument – a market model and a conflict model.

BACKGROUND

Markets and Achievement

Though many argue that giving students and parents the opportunity to choose schools will improve educational achievement and reduce educational disparities (Chub & Moe 1990), others contend that choice may exacerbate existing educational inequality (Wells 1996; Wells, Holme, & Ashuveda 2002). The first line of reasoning, known as the market model, claims that a system of choice will force schools to compete for a clientele, compelling schools to organize more effectively. According to Chubb and Moe (1990), school organization is the specific mechanism propelling increased achievement in choice schools. By school organization, the authors mean the internal operations of schools or "the *process* through which schools produce desired outcomes". Within Chubb and Moe's framework, highly organized schools possess the following characteristics: a large percentage of students in the academic track, high academic expectations for students, efficacious teachers, strong and highly motivated principals, principals who have autonomy and power over school policy, fair and effective disciplinary practices, more academically oriented school goals, etc. Therefore, if schools must maintain a clientele in order to remain open, then they will be forced to organized better in order to effectively serve parents and students.

In particular, a large academic track is the bedrock of an effectively organized school according to Chubb and Moe. Though their reasoning is a bit circular, Chubb and Moe maintain that effectively organized schools place a larger percentage of their

students in the academic track and that a large academic track is an indicator of an effectively organized school. They find that in schools classified as effective, an average student - with average ability, average SES, etc. - has a .52 probability of being in the academic track. The same student in an ineffectively organized school only has a .27 probability of being in the academic track. In sum, effective schools have a host of characteristics, but a major underlying feature of these schools is that they minimize curricular differentiation and place a large proportion of their students in the academic track. Of course, as critics of tracking note, reductions in grouping and curricular differentiation lead to increased aggregate achievement (Gamoran 1992). In sum, markets increase school effectiveness across the board.

Overall, the market model of school choice proposes that choice creates a market for schools and markets better serve the public. Choice schools are better organized than regular schools and also have a larger proportion of their students in the academic track. Figure 6.1 shows the hypothesized linkages between school choice, school organization, and student-level achievement among public schools.

(Figure 6.1 about here)

Conflict and Achievement

Broadly, critics of school choice argue that choice may reify segregation and academic isolation, in fact, doing the opposite of what choice advocates contend choice will or should do (Archbald 2003; Fuller 2002; Saporito 2003; Wells 2002). I collapse the arguments critical of choice and refer to them as "conflict models". Conflict models, in contrast to market models, maintain that choice will not improve achievement. Within this framework I argue that choice schools (and more broadly a system of school choice

in general, though I am unable to test that assertion specifically here) transform inequality by shifting disparities that once existed *between* schools to *within*-school disparities. Though critics concede that choice is often implemented for the purposes of reducing racial and economic segregation and/or improving academic outcomes for the poorest of students, some maintain that choice achieves neither goal and instead increases racial and economic segregation at the building and/or classroom level. Those critics who point to increased segregation at the building level in choice schools argue that parents choose schools with demographic compositions that match their own status backgrounds (Henig 1996; Saporito and Lareau 1998; Saporito 2003). Thus, in an effort to avoid dissimilar others, white parents choose white schools, black parents choose black schools, poorer parents choose poorer schools, etc. In this way, critics contend that choice only exacerbates racial and economic segregation.

In contrast, other critics of school choice assert that choice may actually reduce segregation and increase diversity at the *building* level, since for example, many choice programs were created to help racially balance schools (Blank, Levine, & Steel 1996; Chubb and Moe 1990; Schneider, Teske, & Marschall 2000; Wells & Crain 2005; Wells 1993;). Yet, while choice may decrease segregation at the building level, these critics also insist that choice potentially increases segregation at the *classroom* level (Mickelson & Heath 1999; Wells 1993; Wells 1996; Wells, Holme, & Vasudeva 2002). As affluent parents attempt to generate closure by limiting the access of disadvantaged students to high-level programs and shield their children from contact with dissimilar others, increased diversity at the building level leads to more race and class-based segregation at the classroom level, i.e. more academic tracking. Thus, as critics of tracking argue,

increased tracking will intensify achievement gaps between those students at the highest

and lowest ends of the tracking continuum (Gamoran; Oakes 1985; Oakes 1994). In sum,

critics of choice argue that the policy, though well-intentioned, may be flawed, in fact

increasing the very forms of segregation (racial, economic, and academic) it seeks to

attenuate.

I test the argument that allowing students to choose schools will result in

increased racial and economic heterogeneity in public schools. Furthermore, I extend this

claim by arguing that racial and economic heterogeneity will reduce the likelihood of

being in the academic track for minority and low SES students. Choice is likely to lead

to increased heterogeneity for a few reasons. First, while freeing schools from

geographical zoning constraints means that schools are likely to draw their student body

from a larger possible pool, it also means that those students attending the poorest quality

schools, typically poor and minority students, can choose more affluent, and in turn,

better performing schools. Likewise, in an effort to reduce segregation, school districts

typically designate schools with high concentrations of minority students as magnet

schools in order to attract white students into those schools. Thus, choice amplifies racial

and economic heterogeneity in schools in a variety of ways.

More importantly, however, is the idea that increased diversity is associated with

heightened use of academic tracking in racially and socioeconomically heterogeneous

schools. Early work suggests that ability grouping is most prominent in schools with

sizeable populations of minority students (Braddock 1990). Similarly, Lucas (2007;

2002) finds greater incidences of de facto tracking in schools with more socioeconomic

and racial diversity.[26] Lucas and Berends (2007) found that White students had a greater

chance of taking college-prep courses in more racially diverse schools while Black

student's chances of taking college-prep courses decreased in racially diverse schools. In

sum, since public schools of choice are likely to be more racially and economically

heterogeneous than non-choice public schools, tracking in these schools may negate

increases in achievement for poor and minority students that market proponents contend

choice will impart.   Figure 6.2 shows the hypothesized relationships between school

choice, diversity, tracking, and achievement in public schools. [27]

(Figure 6.2 about here)

SUMMARY AND HYPOTHESES

Market models predict that choice will increase student-level achievement by

improving school organization. Furthermore, the market model, at least Chubb and

Moe's version, also predicts that effectively organized schools are more likely to place

the average student in the academic track, increasing the likelihood that students in

choice schools will be exposed to high-level material that will facilitate learning and

achievement. On the other hand, conflict models predict that choice will not increase

achievement or increase the likelihood of being in the academic track for students,

particularly poor and minority students. According to these models, student-level

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[26] The term "de facto tracking" refers to instances when there is a strong "assocaition between students' courses in disparate subjects" (Lucas and Berends 2002). It is distinct from "overarching" tracking programs, where students take all courses in the same program, for example, the "general" or "academic" track, etc. De facto tracking refers to instances where students are not formally assigned to any overarching program, but are instead likely to be in the same course levels across different subjects. For example, a student may take college-prep math *and* college-prep English, though they are a not formally assigned to a broad college-prep program.

[27] Like Figure 6.1, a distinctive feature of this figure is the double-headed arrow between 10th grade achievement and track placement. I allow these indicators to co-vary because these variables run concurrent - academic track is measured across the entire high school career. Given the temporal assumptions associated with causality, there is no clear causal ordering here. However, since the variables are clearly related, I allow them to co-vary for this reason.

achievement is mediated by diversity and tracking. Choice, they argue, is associated with increased racial and economic diversity in schools at the building level. However, in an effort to maintain a monopoly over high-status programs within schools and avoid students from culturally and economically dissimilar backgrounds, advantaged parents push for increased tracking (Wells and Serna 1996). Thus, as diversity increases, the likelihood of being in the academic track declines for students from historically disadvantaged groups, and with it, so does their achievement.

This chapter attempts to address the competing claims of the market and status conflict models by testing the validity and statistical fit of each model. Which model explains achievement better? In particular, to what extent do school-level diversity and tracking mediate the relationship between school choice and student-level achievement? What implications does this have for school choice policy? In the analyses that follow, I use Structural Equation Modeling (SEM) to test the adequacy of the market and conflict explanations for the effects of public school choice on achievement. At the heart of this analysis is an attempt to understand the mechanisms that underlie the relationship between choice and achievement. The use of SEM predicates some causal hypothesis or structure. In fact, I test the causal paths dictated by the market model as well as the conflict model.

I use school and student-level data to test the assertions made by each model. In addition, since private schools are not likely to experience large increases in poor and minority students, this analysis is limited to public schools only. I exclude private schools from this analysis primarily because my theory simply does not fit the private school context. Though vouchers may lead to modest increases in racial and socioeconomic

heterogeneity in private schools, vouchers are unlikely to precipitate substantial demographic transformation. Unlike No Child Left Behind or other public choice policy where poor and minority students are, in theory, relatively free to choose schools, private schools have more discretion in admitting students, leading to a more homogenous (racially, economically, academically) set of students. Furthermore, formal tracking is atypical in private schools. Though there is some evidence to suggest that de facto tracking exists in private schools (Lucas and Berends 2002), this research suggests that this is related most to prior achievement and therefore not a consequence of racial and socioeconomic diversity.

Given the theoretical frames I use, I generate the following hypotheses:

Hypothesis 1 - Markets and Tracking: Students in public schools of choice will have a larger likelihood of being in the academic track compared to their regular public schools counterparts.

Hypothesis 2 - Conflict and Diversity: Public schools of choice will be more economically and racially diverse than regular public schools.

Hypothesis 3 - Conflict, Diversity, and Tracking: Increases in socioeconomic and racial diversity will be associated with decreased likelihood of being in the academic track for minority and low SES students.

METHODS

Student-Level Measures

Achievement. I use student-level 10th and 12th grade math IRT scores as described in the previous chapters to understand which theory best explains achievement in choice schools.

Track/Curriculum Concentration. I use transcript-reported curriculum concentration to gauge the effects of school choice and diversity on student-level track placement. ELS uses a variable developed from student course-taking patterns to gauge curriculum concentration. This variable differentiates between students whose course-taking patterns reflect a concentration in high level academic content, a concentration in a specific occupational or labor market area, a combination of academic and occupational concentrations, or some other pattern. In ELS, academic curriculum concentration is indicated by the following requirements: four credits of English, three credits of math with at least one credit higher than Algebra II, three credits of science, with at least one credit higher than biology, and three credits of social science with at least one credit in US or world history, and two credits in a single foreign language. An occupational curriculum concentration is defined as earning at least three credits in one specific labor market area. Labor market preparation areas include: Agricultural and Renewable Resources, Business, Marketing and Distribution, Health Care, Protective and Public Services, Trade and Industry, Technology and Communication, Personal and Other Services, Food Service and Hospitality, and Child Care Education. I dummy code this variable to reflect an academic concentration versus all other concentrations (academic=1, other=0).

School-Level Measures

Racial and SES Diversity. I include school *racial* and *SES diversity* as key aggregate variables in my analysis. I use racial and SES diversity as indicators of status conflict. These measures, though influenced by school racial and economic composition (the larger the percentage of minority students in a school, the more diverse the school is to a

point) are distinct from composition. School racial and economic composition are typically measured using the percentage of minority students and percentage of students available for free and reduced lunch in a school. These indicators are often used to capture resources available to schools – the higher the percentage of students on free and reduced lunch and the more minority students, the fewer financial, physical, and pedagogical resources available to schools.

Diversity, however, is intended to capture race and SES-based conflict that might occur in schools. While research overwhelmingly indicates that school-level achievement is likely to have an inverse relationship with school demographic composition (see Riordan for review), the effect of diversity on tracking and ultimately achievement has rarely been studied and is therefore less clear. Existing research suggests that ability grouping is most prominent in schools with sizeable populations of minority students (Braddock 1990). Moreover, other research finds greater incidences of de facto tracking in schools with more socioeconomic and racial diversity (Lucas 1999; Lucas and Berends 2002; 2007). Accordingly, I predict that choice will lead to greater levels of diversity, increasing the likelihood that tracking will be used to differentiate students, which will in turn, result in diminished overall levels of math achievement in schools.

SES Diversity. Consistent with Lucas' work, I use the standard deviation of a school's mean SES to represent the amount of variation in school SES. The larger the variation in school SES, the more economically diverse the student body.

Racial Diversity. I utilize an index of racial diversity used by Lucas and colleagues in their work (Lucas and Berends 2002; 2007). I create the index using data

taken from the 2001-2002 Common Core of Data. The Common Core of Data is a large

comprehensive database compiled by the National Center of Education Statistics (NCES)

that contains basic demographic and descriptive information on the entire universe of

elementary, middle, and secondary public schools, all public school districts, and all state

education agencies in the US. Information on schools includes school location and type,

total enrollment, enrollment by grade, student racial and economic characteristics

(number of students eligible for free or reduced price lunch), number of teachers, etc. In

order to construct the index, I extracted data from CCD on total school enrollment, along

with the total number of White, Black, Asian, and Latino students in the school. I use the

following formula to calculate the racial diversity index:

$$D_r = (k(N^2 - \sum f_{sk}^2))/N^2(k-1))$$

where k equals the number of racial groups in the school, N is the total number of

students in the school, and f_{sk} is the number of persons of race k in school s. The index

ranges from 0 to 1. Schools with only one ethnic group have no racial diversity (k=0),

and therefore have a score of zero on the index, while schools with many racial groups

represented in relatively equal measure have scores closer to 1.

Analytic Strategy

I use Structural Equations Modeling (SEM) as a tool to gauge the validity of the

two competing theoretical models I compare.   The purpose of conducting a SEM is

twofold. I use SEM as a way to test the overall validity and fit of the market and conflict

frameworks. Specifically, I attempt to determine whether one model fits the data better

than the other. Do market or conflict models best explain the relationship between school

choice and student-level achievement? In the process of testing overall model fit, I am

able to test the individual paths between each of the indicators in the model. These paths correspond to individual regression coefficients for each of the specified parameters (i.e. choice and organization) in the model.

SEM is a multivariate analytic technique that incorporates a conceptual and casual schematic to estimate the validity of a set of hypothesized causal relationships among a group of variables. I use path analysis, a specific SEM technique that is useful when there is only a single observed measure for each theoretical construct (Kline 2005). Path analysis can be viewed as a simple SEM technique, but also as an extension of multiple regression. While there is only one dependent variable in multiple regression, a path analysis has multiple dependent variables. SEM/path analyses typically begin with the formulation of a path diagram or schema that illustrates the causal relationships between a pertinent set of variables. Furthermore, SEM produces statistics that permit researchers to test the fit of one's overall causal model. In this way, it is possible to compare the suitability of one model against a second model of which the first is nested. I use SEM to examine the validity and fit of the two competing theoretical models (market and status conflict) I suggest explain outcomes in choice schools.[28] This analysis addresses four questions raised earlier. First, to what extent does school choice affect student-level acheivement and track placement? Second, to what extent is choice associated with school–level racial and economic diversity? Third, to what degree is school-level racial and economic diversity associated with differential track placement for students of varying races and social classes? Finally, how well does each theoretical model explain the overall relationship between choice and achievement?

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[28] All SEM models are estimated using Mplus.

RESULTS

To gauge the validity and fit of the market and conflict models, I evaluated a number of models with varying paths. I present the most parsimonious and best fitting models.

Market Model – Increased Achievement through Enhanced Organization

Table 6.2 presents the results of the path analysis examining the role of public school choice on student-level track placement and achievement. According to Chubb and Moe's version of the market model, choice should increase the organization and effectiveness of schools. Effective schools are especially successful in placing a high percentage of their students in the academic track. If choice increases school effectiveness, then choice should also increase students' likelihood of being in the academic track. To this degree then, examining the precise effects of choice on track placement is important. Does choice significantly increase a student's likelihood of being in the academic track, as market models would suggest? Table 6.2 suggests otherwise. Choice has a significant *negative* effect on likelihood of being in the academic track (β=-.07). In other words, public high schools of choice *reduce* the likelihood of being in the academic track compared to regular public high schools**.** This finding is important because it directly contradicts predictions made by the market model of school choice. If choice schools are supposed to enhance school organization, then attending a choice school should increase the likelihood of being in the academic track. But this is not the case. This finding demonstrates that choice schools do little to improve this aspect of school organization.

More importantly, choice has a significant negative direct effect on 12th grade

math achievement (β=-.02). This also directly contradicts predictions made by the

market model of school choice. The hallmark of is the market model of school choice is

the notion that choice will improve achievement. More importantly, being in the

academic track has a positive and significant effect on 12th grade achievement (β=.13).

Despite the negative path between choice and achievement and the negative path between

choice and track, fit statistics suggest that the model fits the data well. A good model fit

is indicated by a nonsignificant chi-square test statistic, A CFI and TFI above .9, an

RMSEA less than .1 (Kline 2005)[29]. The fit statistics shown in Table 6.2 are well within

this range (χ^2=10.674/df=2, CFI=.997, TFI=.993, RMSEA=.023). Thus, the results

presented here do not support the main tenets of the market model – that public school

choice will enhance student achievement and increase the likelihood of being in the

academic track. The market model, therefore, falls short of expectations in this regard.

(Insert Table 6.2 about here)

SES Diversity

Findings from the previous chapter suggested that although public schools of

choice widened the SES gap in achievement, this result could not be attributed to track

placement or advanced courses-taking. Here, I add an additional element to the question

and attempt to determine if *school-level economic and racial diversity* mediate the

relationship between choice and track placement. To reiterate, conflict models predict

that: 1) choice schools will be more economically and racially diverse than regular

public schools. 2) This increased heterogeneity should be associated with a decreased

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[29] A nonsignificant chi-square is not necessary to indicate that the model fits the data well. The chi-square statistic is sensitive to sample size, and larger samples typically lead to the rejection of a chi-square statistic (significant chi-square). Hence, a significant chi-square does not always suggest that model fit is poor.

likelihood of being in the academic track for poor and minority students, which in turn 3) will be associated with lower levels of math achievement for students. The market model in this analysis is represented by two specific direct paths – the effect of choice on track location and the effect of choice on 12th grade achievement. This model predicts that choice will increase the likelihood that a student will be in the academic track and that choice will also enhance achievement.

Table 6.3 presents the results of the path analysis examining the effects of choice on school-level SES diversity, student-level track placement, and student-level achievement. I present five models: one pooled analyses including all SES groups in a single model followed by four separate models analyzing each SES quartile separately. I analyze SES quartiles separately to test the possibility that the effects of SES diversity will differ depending on the SES group in question. Conflict models predict that students in the highest SES quartile will benefit from SES diversity – their chances of being in the highest track in economically diverse schools will increase. Conflict models predict countervailing effects for Low SES students. According to this model, students in the lowest SES quartile, are more likely to end up in the lowest track in economically diverse schools.

As predicted, choice and SES diversity appear to have unique effects depending on the SES group in question. In the pooled model, public schools of choice resemble regular public schools in terms of economic diversity. There are no significant differences between regular public schools and public schools of choice in this regard. This is also the case for students in the lowest, second, and third SES quartiles. That is, these students attend schools that have socioeconomic distributions similar to those in

regular public schools. However, students in the highest SES quartile attend schools that have significantly more SES diversity than students from other SES quartiles. This, as we will see later, has direct implications for the chances of being in the academic track for high SES students.

Although market models predict that choice will increase the likelihood of being in the academic track, the data suggest that choice is associated with a *reduction* in the likelihood of being in the academic track for students of all SES groups except for the lowest SES quartile. However, the latter effect is small not significant. This is a direct rebuke of the market model. Again, Chubb and Moe argue that choice will increase the likelihood of being in the academic track for the average student. The results of this analysis suggest that this is not the case.

In contrast, the conflict model predicts that choice will increase racial and SES diversity at the building level but will decrease racial and SES diversity at the classroom level, suggesting that there is a reduced likelihood that minority and low SES students will end up in the academic track. The results presented in Table 6.3 show that increased SES diversity is associated with a significant reduction in the likelihood of being in the academic track for students from the lowest SES quartile. Yet, for students in the highest SES quartile, SES diversity is associated with a significant *increased* chance of being in the academic track ($\beta=.07$). These countervailing effects indicate that SES diversity results in disparate tracking outcomes for students of different social classes.

(Insert Table 6.3 about here)

Racial Diversity

Table 6.4 displays the results of the path analysis examining the effect of choice on school-level racial diversity, student-level track placement, and achievement. These results mirror those seen in the SES diversity model. Overall, choice is again associated with a decreased likelihood of being in the academic track. This is the case in the pooled model (β=-.06) and the model for White students (β=-.10). Again, this finding contradicts predictions made by the market model. Chubb and Moe argue that choice should increase the likelihood of being in the academic track for the _average_ student. Since the average student is likely to be White, this provides evidence further rebuking the market model. However, in the Black and Latino models, choice is associated with an increased likelihood of being in the academic track. This effect is significant for Latino students.

Turning to the predictions made by the conflict model, the results show that public schools of choice appear to have more racial diversity than regular public schools (β=.12, pooled model). This finding is easily explained. Increased racial diversity in public schools of choice may be a consequence of the way many school systems designate a school as "choice". Magnet schools are typically created in an effort to increase diversity, specifically by adding innovative programs or curricula in the hopes of attracting White students to schools with high concentrations of minority students. Still, this finding contradicts previous research suggesting that choice schools increase rather than reduce race-based segregation (Henig 1996; Saporito and Lareau 1998; Saporito 2003).

As in the SES diversity models, the effects of increased racial diversity on track placement differs by racial group. White students benefit from increased racial diversity; Black and Latino students do not. Increased racial diversity is associated with an increased likelihood of being in the academic track for White students (β=.09) and a decreased likelihood of being in the academic track for Black (β=-.08) and Latino (β=-.10) students. Again, these countervailing effects indicate that racial diversity leads to disparate outcomes for students of different racial backgrounds. White students appear to gain from the racial diversity created by school choice, while minority students appear to be disadvantaged by it.

Model fit statistics suggest that the racial diversity model fits the data better than the SES diversity model. In the pooled models, the choice-racial diversity model has a chi-square of 120.654/df=3, a CFI of .962, and an RMSEA of .075 while the choice-SES diversity model has a chi-square of 2329.557/df=7, a CFI of .923, and an RMSEA of .213. Furthermore, since the paths predicted by the market model seem to falter in all analyes, the present results suggest that conflict models, particularly racial diversity models may more accurately describe the relationship between choice and achievement.

(Insert Table 6.4 about here)

DISCUSSION

The purpose of this chapter was to compare the validity and fit of the two frameworks I use to explain the effects of public school choice on student-level achievement. On the one hand, market models suggest that choice will enhance achievement by forcing schools to "organize more effectively" (i.e. improve their internal operations). Part of being more effectively organized means increasing the likelihood

that the average student will be in the academic track. Conflict models, on the other hand, claim that choice will not improve school achievement. Instead these models contend that choice only reconstitutes inequality, shifting disparities that once existed *between* schools and making them *within* school disparities. More specifically, critics of choice claim that although choice may reduce racial and SES segregation at the *building* level, choice increases segregation at the *classroom* level. As a result, choice might not improve the achievement of poor and minority students, since they are likely to be placed in the lowest academic track once in choice schools. The results presented here provide general support for the conflict model. Public schools of choice have more racial diversity than regular public schools. Diversity, in turn, is associated with different track placements for students of varying races and social classes. Students in the highest SES quartile were more likely to be in the academic track in economically diverse schools. Similarly, White students were also more likely to be in the academic track in racially diverse schools, while Black and Latino chances of being in the academic track decreased as racial diversity increased. As expected, track placement was associated with achievement – the higher a student's placement, the higher a student's achievement. Thus, choice does not appear to improve achievement for poor and minority students.

Contrary to the predictions made by Chubb and Moe, market models performed poorly. Public school choice was not associated with an increased likelihood of being in the academic track. On the contrary, students enrolled in public schools of choice were *less likely* to be in the academic track. More importantly, public shool choice also had a negative direct effect on 12th grade math achievement. Both results contradict predictions made by market models.

The findings uncovered here may help explain findings from Chapter Five which suggested that public school choice was associated with an increased SES gap in math achievement. The idea was that if there was a larger SES gap in achievement in public schools of choice, the gap could be attributed to class-based differences in track placement that disadvantaged students from low SES backgrounds. However, the results from Chapter Five indicated that track placement did not mediate class-based differences in math achievement in public schools of choice. Rather, there were no SES differences in track placement or advanced course-taking in public schools of choice. This chapter seems to clarify the earlier result. Here it appears that SES differences in track placement within public schools of choice exist only to the degree that public choice increases SES diversity in schools. Moreover, the effect seems to be strongest at the very highest levels of SES.

Both conflict models, however, point to interesting patterns in racial and economic diversity in public schools of choice. The findings suggest that choice schools increase racial diversity and to a lesser degree SES diversity. Although I cannot ascertain the extent to which the schools of choice in this study actively pursue diversity as an agenda, previous research suggests that implementing public choice as a schooling option is a direct attempt to desegregate schools, though success in this regard varies (Henig 1994; 1996b; Schneider, Teske, & Marschall 2000; Wells 1993; Wells & Crain 2005). For example, Wells and Crain (2005) note that voluntary choice plans are often implemented as an alternative to mandatory busing or race-based mandatory assignment-type desegregation plans.

However, the finding that choice increases racial and SES diversity contradicts previous research suggesting that choice may exacerbate race and SES segregation because parents are compelled to choose schools whose demographics match their own background (Saporito & Laureau 1998; Henig 1996a; Saporito 2003). According to the authors, race and class-based biases on the part of parents largely influence parental choice, often outweighing concerns about academic excellence. However, other research suggests that racial balance in choice schools is a consequence of strict regulation on the part of school and district officials. For example, Henig (1996b) notes that school officials in Montgomery County, MD tightly maintain racial balance by rejecting transfer requests that might upset a school's racial balance and also by limiting the expansion of magnets into more affluent areas of the county.

While the findings uncovered here answer an interesting set of questions, they also raise new ones. What mechanisms or processes link diversity and tracking policy? Previous work (Oakes 1994a; 1994b; Oakes and Wells 1996; Wells, Holme, & Vasuveda 2002) suggests that affluent parents not only want to separate their children from culturally dissimilar others, but also that these parents want exclusivity in the children's education – they want their children to get something that other students will not have access to. Consequently, these parents push for more academic differentiation between students as the demographic environment of their children's school changes. Moreover, these parents also have the human, social, and cultural capital to make such demands. This might be especially relevant in a climate of increased diversity, where low income parents may not have the resources to compete with advantaged parents and successfully advocate for their children.

In terms of policy implications, these findings are clearly relevant to current policy initiatives like No Child Left Behind that frame choice as a means of ameliorating race and class-based achievement disparities. However, in light of anecdotal evidence which suggests that choice options are not utilized when available, the finding that choice creates racial and SES diversity is interesting. Who uses the choice clause in the law? How does the kind of choice created by No Child Left Behind affect diversity and equity in schools? Even before the passage of No Child Left Behind, some argue that few students and parents either choose to or were are able to utilize the choice-out options in their districts (Mickelson 2005). For example, in New York City in 2004, only 5,000 students requested transfers when more than 300,000 students were eligible to leave failing schools under No Child Left Behind (Gootman 2004). Wells (1996) found that Black St. Louis students who opted to remain in all-Black city schools rather than attend affluent suburban schools despite having a choice did so because they revered the "sense of kinship and shared culture represented by the all-black school" (p.33). Given the emphasis on choice in No Child Left Behind, future research should investigate the correlates of choice within the context of the law.

Overall, it appears that choice and diversity may have paradoxical consequences. Efforts aimed at achieving equity in one respect produce inequality in another. Choice produces diversity, but neither choice nor diversity improve academic outcomes. The ultimate challenge facing researchers, practitioners, and policymakers is to find a viable means of advancing equity and exellence for all.

CHAPTER SEVEN

CONCLUSION

My interest in school choice stems not only from my training as a sociologist, but also from my personal experience as a graduate of a magnet high school. The district in which I attended high school had implemented magnet programs as a means of achieving racial balance within the district. The magnet program in my school embodied all of the inequalities I would later discover characterize tracking regimes generally – the magnet program was a small prestigious school within a larger, mediocre one. And, although the school was largely African American, few African Americans were enrolled in the magnet program. Was the district's choice policy helping those students most in need? Or was it merely reproducing the inequalities that already existed under the well-intentioned guise of desegregation?

This dissertation set out to address a basic yet imperative set of questions regarding the utility of school choice - does school choice work? That is, does choice increase achievement and reduce the achievement gap between minority and white students? Low and high SES students? In this chapter, I review the key findings from this project, discuss the contributions this research makes to the broader the study of education, address the implications this work has for education policy, and discuss my future research agenda for this project.

SUMMARY AND KEY FINDINGS

The first three chapters provide the context for this research. In Chapter One, I introduce the research questions and the significance of studying school choice. In Chapter Two, I introduce the theoretical frameworks I use to structure my argument. I

rely on two frameworks: a market model favored by economists and a conflict framework rooted in sociological traditions. The market model, initially proposed by Milton Friedman but made most famous by Chubb and Moe, suggests that a system based on parental and student choice rather than a system anchored on assignment by strict zoning regulation will improve ailing American schools. According to Chubb and Moe, American schools are plagued by bureaucracy. Choice will free school administrators from institutional and bureaucratic constraints. Proponents of the market model suggest that choice will create a clientele for schools, and when schools fail to satisfy parents and students, parents and students can leave these schools in search of one that meets their expectations. This line of reasoning contends that without a clientele, failing schools (or schools that fail to meet student and parental expectations, in the view of market proponents, these seem to be intertwined) will successfully compete or meet a more dismal fate - closing their doors. Accordingly, supporters of the market model contend that a system of choice will lead to higher levels of achievement.

The conflict model, however, claims that choice will not improve outcomes for students. Though choice may reduce race and class-based segregation in choice schools at the *building level* (Schneider, Teske, & Marschall 2000), adherents of this model suggest that choice may increase race and or class-based segregation of students at the *classroom level* (Wells 1996; Wells, Holme, & Vasudeva 2002). In particular, this model suggests that although choice programs were in many cases implemented to increase the racial and SES diversity of choice schools, this increased racial and SES diversity is associated with a smaller proportion or poor and minority students in the academic track compared to regular public schools. Proponents of the conflict model contend that in a

climate of increased diversity, advantaged parents attempt to secure high curricular

placements for their children and shield them from contact with poor and minority

students. In this way, school choice has unintended consequences, ultimately increasing

educational disparities the policy was proposed to ameliorate.

In Chapter Three I summarize the measures and methods I use to answer the

research questions I raise. I detail the methods used to create various indices, impute

data, and the rationale used to measure specific constructs.

Chapter Four introduces the first set of empirical analyses in the dissertation.

This chapter addressed two main questions: First, are choice schools "more organized"

than regular public schools? Second, do "more organized" and/or choice schools have

higher levels of achievement? The findings provide some support for the market model.

Public school choice *does not* enhance school organization as conceptualized by Chubb

and Moe. Magnet schools and other public schools of choice are not more organized than

regular public high schools. In addition, only Catholic schools are more organized than

regular public schools; non-Catholic private schools appear to be more organized than

regular private schools, but this effect is mediated by better physical facilities and

improved behavioral climates in non-Catholic private schools.   Moreover, although

Catholic and non-Catholic private schools had greater achievement gains than regular

public high schools, school organization has no significant effect on achievement gains.

Therefore enhanced organization does not translate into higher levels of achievement in

non-Catholic private schools.

Chapter Five examines the effect of public and private choice on race and SES-

based gaps in achievement and tracking. Market models predict that choice should

reduce the gaps in achievement while conflict models suggest that choice might increase race and SES-based gaps in achievement via differential track placement or course-taking. Three intriguing results emerged. First, the results show that the SES gap in achievement is *larger* in public schools of choice and private schools than in regular public schools. However, the increased SES gap in achievement was not due to an attendant SES gap in track placement or AP course-taking as hypothesized. Second, private schooling *reduces* the SES gap in track placement/AP course-taking. That is, the SES gap in advanced-course taking is smaller in private schools than in regular public schools. The third fascinating result involved the *attenuation* of AP/IB course- taking among Latino students in public schools of choice. In regular public schools, these students have an AP/IB advantage over White students. They take significantly more AP/IB courses than White students. However, public choice significantly *reduces* the number of AP courses Latino students took.

Finally, in Chapter Six I test the validity of the causal frameworks and causal hypotheses I use to structure my arguments. In this chapter I ask: Do market or conflict models more aptly explain the relationship between school choice and achievement? Using school and student-level data and Structural Equation Modeling, I examine whether public high schools of choice are more likely to place students in the academic track and whether racial and economic diversity mediate the effects of public choice on track placement. I find that market models do not adequately explain the relationship between choice and achievement. Though market proponents claim that choice will improve achievement primarily through its effect on school organization, in this case, increasing the likelihood of being in the academic track, my findings reveal that choice

had quite the opposite effect on track placement, *decreasing* the likelihood of being in the academic track.

On the contrary, my predictions regarding the effects of choice on school diversity and tracking were supported. The results indicate that public schools of choice are in fact more racially diverse than regular public schools. Racial and economic diversity are associated with a reduction in the probability of being in the academic track for Black and Latino and low SES students on the one hand and increased likelihood of being in the academic track for White and high SES students.

In total, the evidence uncovered here provides broad support for the conflict model and little support for the market model. Generally speaking, school organization has modest to no effects on achievement and choice appeared to increase race and class-based inequality in achievement and tracking/course-taking. The findings for Catholic schools, however, appear to be the one exception. Interestingly, although previous research suggests that private schools have smaller race and class-based gaps in achievement, the research presented here indicates that there is a slightly larger class-based achievement gap in private schools than in regular public schools. This clearly contradicts the market model. Moreover, the enduring Catholic school effect suggests that wide-reaching claims for market reform in the educational system ignore features unique to Catholic schooling that cannot be replicated elsewhere. In short, competition and conflict seem to best characterize the relationship between choice and achievement.

KEY CONTRIBUTIONS AND POLICY IMPLICATIONS

Taken together, the findings uncovered here have a number of important implications. Public choice options had little positive effect on academic outcomes.

Given the emphasis of No Child Left Behind as a means to ameliorate inequality, these findings suggest that public choice, while appealing, may not improve achievement disparities. Rather, public choice appears to enhance the very disparities it was created to eliminate. Thus, choice may be *reproducing* rather than *reducing* inequality. Public choice options, in many ways, appear to benefit those who are already privileged. While this has certainly been a critique of education in general (Bourdieu 1978; Bowles and Gintis 1975), school choice has been perceived as a tailored solution, designed to specifically address race and class-based disparities in American schools. Moreover, given the resources devoted to the implementation of choice as a means of improving the quality of American schools, the idea that public choice serves to not only reproduce but enhance disparities is troubling.

What the results do suggest is that public choice policies may need to be coupled with detracking policies, or rather, policies that minimize or eliminate curriculum differentiation in order for choice to produce a modicum of benefit. As Lucas argues, the language of the tracking debate often obscures an important distinction – the difference between tracking and curriculum differentiation. However, it is necessary to be more specific here and distinguish between the two. Tracking relates to the grouping of homogenous groups of students for instruction; it concerns *assignment* to a group for instruction. This is also known as ability-grouping. Curriculum differentiation, however, concerns the content of instruction. It involves whether all (or most) students in a school receive instruction in geometry or calculus, for example, or whether some students receive instruction in calculus while others are taught algebra or worse yet, basic arithmetic. Eliminating or minimizing curriculum differentiation would mean that all

students would be exposed to the same or similar material. A completely undifferentiated curriculum would mean that all students would study the exact same material at the same level. A less differentiated curriculum would mean that students may not receive the exact same amount of exposure to the same material, however, the disparity would not be as sizeable as the difference between basic arithmetic and calculus for example. In the latter curriculum, the lowest level math offering would still reflect a high-level of study.

This reasoning sounds simple in the abstract but may prove to be much more difficult in practice. Previous research suggests that those who benefit from tracking and curricular differentiation (i.e. students from advantaged backgrounds) tend to be the most vociferous opponents of detracking (Wells, Holme, and Vasudeva 2000; Wells and Oakes 1996; Wells and Serna 1996). Moreover, advantaged parents tend to have a great deal of influence and often successfully dissuade administrators from detracking schools. Though this may be a difficult task, there must be at least some recognition that reform of the magnitude of No Child Left Behind is futile if students are merely shifted from inferior programs in bad schools to inferior programs in good schools. As Elmore and Fuller (1996) note, the design details of choice programs matter. For example, in some districts, choice programs are highly regulated by the district to prevent racial segregation from worsening, since parents are often inclined to choose schools that match their own demographic backgrounds (Henig 1996a; 1996b). Administrators reject student applications that might worsen the racial balance of schools. Therefore, if managed choice can preclude worsening segregation, can choice not also be managed or configured so that all students are exposed to high-level content.

Though public choice options do little to reduce achievement disparities, the private sector alternative, which typically surfaces in the form of vouchers in public policy debates, appears to reduce inequality in some measure, since private choice options proved effective at reducing the SES-gap in track placement and advanced course-taking. Moreover, vouchers cannot produce sweeping change in the American education system. As of 2007, 90% of all students in the US were enrolled in public schools. Doubling the size of the private sector would still mean that 80% of all students attend public schools. Moreover, moving ten percent of the neediest public school students into the private sector would not seem to make much of an impact overall either. Furthermore, who would benefit most from vouchers? There is an abundance of literature on school choice which suggests that only the most motivated, involved, and informed parents opt of their regularly assigned schools (Henig 1994; Schneider, Teske, & Marschall 2000; Wells and Crain 1997). Thus, voucher programs aimed at improving the educational outcomes of low-income students might therefore only help a select few. Likewise, not only are private schools unable to absorb enough of the students in need of better alternatives, but how willing are these schools to open their doors en masse to students who are culturally and economically dissimilar from their current student body?

Nonetheless, the findings generated here indicate that private schools may also enhance the SES gap in achievement, though to a lesser degree than public choice options. Moreover, as Chapter Four indicated, all private schools are not created equal. This phenomenon has implications for the voucher debate as well. Catholic schools appear to be unique. They surpass other private schools with regard to achievement, at least compared to regular public schools. Bryk, Lee, and Holland (1993) are particularly

adamant about the distinctiveness of Catholic schools. Though they note that the organizational practices touted by market proponents may be more prevalent among non-Catholic private schools, Catholic schools remain "unusually effective" at reducing achievement disparities among students of different social backgrounds. The authors contend that Catholic schools and non-Catholic private schools differ in important ways, namely the significance of "value communities" in Catholic schools. Bryk. Lee and Holland therefore attribute the effectiveness of Catholic schools to the cohesion fostered by values, religious and otherwise, shared by those apart of the community. Similarly, non-Catholic private schools are a motley crew of sorts - there is a great deal of variation among non-Catholic private schools. Though the term "private school" typically evokes an association with "elite" or upper-class schooling, there is some evidence to suggest that private schools may be more heterogeneous in this regard. For example, Coleman, Hoffer, and Kilgore (1982) find that although there are few vocational-technical schools outside the public sector, there are comparable percentages of special education and alternative schools in the private sector. Hence, Bryk, Lee and Holland argue that"blanket claims" regarding the benefits of privatization are problematic as broad-based market solutions may not ameliorate achievement disparities.

Still, one of the key implications of this research has to do with balancing equity (in terms of input and output) and excellence in schools. The findings presented here suggest that choice schools do accomplish the very important goal of achieving equity in terms of input - that is, exposing students of different social backgrounds to the same educational environments, at least at the building level. However, this diversity may exacerbate educational disparities, i.e. equity in terms of output. The very students

thought to benefit from choice and the increased diversity it generates also appear to suffer as a result of it. Moreover, in contrast to predictions made by market proponents, increased organization does not necessarily benefit schools in terms overall achievement (excellence).

In terms of theoretical implications, market claims for choice are problematic to the extent that they ignore the realities of conflict and competition processes in schools and society in general. This is often a sociological critique of neoclassical economic models (Collins 1980). Individuals and groups cannot invest their fortunes in the workings of an unfettered market because the market is not unfettered for all. Power and politics cast a grim and imposing shadow over the marketplace or at least the potential of market reform. Thus, even if there are arguably few to no constraints on the school choices students and parents are able make, once in those schools, the struggle for power and resources erode the possibilities for equality.

LIMITATIONS AND FUTURE PROJECTS

This dissertation has four noteworthy limitations. Three of these limitations can be attributed to shortcomings in the data set I use. The first shortcoming involves ambiguity over the designation "other schools of choice" in the data set. Without accompanying district information, it is unclear whether this means that these schools are located within a district that offers system-wide choice or if these schools are simply magnet schools in a system which lacks a broad-based choice option. The second shortcoming of the data concerns the lack of specific information regarding student enrollment in the choice program. That is, there is no information in the data set that permits researchers to distinguish between those students who are enrolled in the

choice/magnet program in a choice school and those students who attend because it is their neighborhood or regularly assigned school. If this information were available, one could explicitly identify those students enrolled in the choice program, how this enrollment varied by race and class, and ultimately how enrollment in the choice program affected achievement.

A third limitation of this project involves my inability to include charter schools in this study. This was due to the meager number of charter schools available for analysis in the data set. Of the 752 schools included in ELS, only 8 were charters. This small subsample could be attributed to the small number of charter high schools nationwide. Charter schools appear to be more abundant nationally at the elementary level than the secondary level (NCES 2007b). Since the sampling strategy of ELS is designed to produce a representative sample of schools as well as students, the number of charter high schools in the sample may well be representative of the number of charter high schools nationally. Consequently, examining choice as it pertains to charter schools may be an endeavor best undertaken with a survey of younger students.

Finally, the fourth limitation of this project involves the characterization of competition. Market models of school choice, particularly those developed by economists, analyze the effects of choice at the system-level, maintaining that choice will only force schools to compete if the entire system is open to choice. I do not analyze systems. Rather, I limit my analysis to schools. My reason for doing so is entirely practical – the data set I utilize lacked information on district-level choice options. I did investigate a resolution involving matching district-level data from outside sources to the school-level data in ELS, however this solution was beset with a unique set of problems

(time constraints, availability of data, uniformity of data quality across districts, etc). Consequently, I maintained the present course of the research.

Although these weaknesses may restrict the generalizability of this research, the limitations as well as the findings uncovered by this project evoke several possible extensions and directions for future research. Of course, given the shortcomings in the present data set, I must utilize different data. First, in the spirit of a "true" market model, I would like to examine whether increasing numbers of magnet and charter schools at the state-level spur public schools to "compete" and increase their achievement levels. This project is in part inspired by Arum's (1996) work on the size of the private school sector and student performance. Arum found that increased numbers of private schools in a state were associated with improved student test scores. However, he discovered that the mechanism driving this effect was not increased organizational efficiency (as measured by teacher-student ratio), but rather was a consequence of increased spending by schools in states with large private sectors. Following Arum's (1996) lead, I plan to combine data from the Common Core of Data on the number of charter and magnet schools by state with concurrent achievement data from a separate NCES data set, possibly ELS, ECLS-K, or NAEP data.

A second project involves extending the current research to investigate how choice affects high school graduation/dropout rates and post-graduate outcomes. Controlling for parental involvement and other relevant covariates, are poor and minority students who attend choice schools less likely to drop out of school? What about labor market outcomes and college entrance and attrition rates? Examining post-graduate outcomes like college success for the matriculates of school choice programs are

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particularly important, if only because they have rarely been studied. For example, while charter school students may not outperform students of similar race and class backgrounds on standardized assessments of math and reading (NCES 2003a), anecdotal accounts suggest that charter school graduates may possess better writing skills than their regular public school counterparts, and experience greater success in college because of this (Personal Communication, December 2007). Other research suggests that students who opt out of their regularly assigned schools are more likely to graduate than similar students who remain in their assigned schools (Cullen, Jacob and Levitt 2000). These questions are rarely asked in school choice research, as the bulk of research examines either who chooses or broader effects of choice on achievement. Consequently, further research in this area is needed**.**

Similarly, one caveat of the present research concerns the true availability of choice. Anecdotal evidence suggests that in reality there may be little choice in school systems that offer choice as a schooling option. For example, in systems where neighborhood zoning and choice policies coexist, students zoned for a particular school typically have first choice for enrollment there. Students outside the designated attendance zone can attend only if there is space. In these instances, there is often not space in desirable schools, leaving few real choices for those in failing schools (Glater and Finder 2007; Mickelson 2005). In light of this reality, future research is needed to determine the extent to which choice is truly available and utilized in systems that offer choice. Moreover, understanding who chooses and in what contexts they choose as well as whether or not those who opt of their regularly assigned schools are awarded placements in the schools of their choice are similarly relevant issues. In light of the

scale and magnitude of No Child Left Behind and its potential for improving outcomes, these questions are important ones.

A FINAL WORD

The findings garnered from this dissertation paint a relatively bleak picture for the prospects of school choice as a means of resolving the "crisis" in American education. It appears that public schools of choice have little problem with achieving equity at the building level, but this equity does not facilitate academic outcomes for students. Nonetheless, a major challenge to policymakers is to develop a policy that improves achievement for all students. The hopes for choice remain high though, as glimmers of promise leave those in search of improvement optimistic. One glimmer is New York City's acclaimed District Four in East Harlem. Located in a poor and largely minority section of New York, the district was one of the city's worst in the early 1970's but changed dramatically after administrators implemented a choice policy in the district. The district is now a bastion of academic success and is hailed as the standard for school choice. In *Miracle in East Harlem* (1993), Seymour Fliegel, a District Four administrator and one of the masterminds behind the district's success, argues:

> The simplest argument in favor of public school choice is a rather crude analogy to a free market system: The laws of supply and demand will ensure that good schools are rewarded while bad schools suffer and ultimately fail when no one selects them. The corollary of this argument is that, given a choice system, schools will compete with each other for students and will therefore improve academically in order to attract their maximum market share.
> Though this is a powerful argument, it tells only part of the story. Market forces alone will not solve our educational problems. We also need intensified commitment from individual teachers to the vision, mission, and goals of the schools; patience and support from administrators; and a commitment to learning on the part of students and parents (p.7).

According to Fliegel, choice alone will not solve America's education problems. Moreover, small scale reform in the form of vouchers will also not suffice. What worked for the Harlem schools was a radical shift in commitment from those involved at all levels. Bryk, Lee and Holland (1993) make a similar argument. "It would therefore be inappropriate to assume that a new system of education, just because it was market driven, would produce effects similar to those described here for Catholic schools. Popular arguments for a system of market controls in education commonly employ a microeconomic explanation that bears little resemblance to the ideas about schools-as-communities" (p. 311).

Both remarks reject myopic views regarding the benefits of market solutions and instead reflect the importance of schools as communities. The notion of schools as communities does not necessarily imply a return to the "gemeinschaft" of earlier eras, or a retreat to provincialism or tribalism, or the reinvention of racial or economic or religious or cultural segregation. What it does imply is a shared commitment to learning and improving the quality of American education. This requires a radical shift in the way Americans think about education – the value we place on it, the resources we devote to it, the degree to which parents participate in their children's learning and formal education and foster a home environment conducive to their children's academic growth, and most importantly, the degree to which students want to do well in school and see education as vital to their existence. This does not preclude a significant commitment on the part of government to equalize access and resources for all students as some would suggest. Ultimately, a broad-based societal commitment to providing universal high-quality education to all students is necessary.

Nevertheless, while market solutions may not be the end-all–be-all solution to race and class-based educational inequality, they may have some limited utility, as the Harlem case suggests. Thus, while choice might not be a magical panacea, the policy may prove useful under some conditions. Consequently, this research does not intend to imply that the policy should be abandoned. A major finding of this study is that the politics of choice also tend to be the politics of diversity. The lack of diversity in the Harlem district may very well explain its success. The district is composed almost entirely of low-income Black and Latino students. In this environment, students' choices may not reflect or be subject to the race or class dynamics seen in more diverse districts. Moreover, the choice program is universal – it encompasses the entire school system and is not limited to a handful of schools.[30] Furthermore, the choice program has been in place for almost 30 years; parents and students are knowledgeable regarding the options available and are able to navigate the system. Overall though, more research is necessary to understand the specific contexts in which choice is useful.

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[30] This is one criticism of school choice reform. In systems where choice is offered in the form of a few alternative schools rather than offered broadly across the district, only a small portion of students are able to take advantage of school choice. According to Chubb and Moe, this leaves the traditional system intact. They note, ""the vast majority of students in these 'choice' systems continue to attend schools of assignment, and all the usual institutions of democratic governance remain in place, doing their usual jobs" (p. 208).

Figure 1.1: Market Model
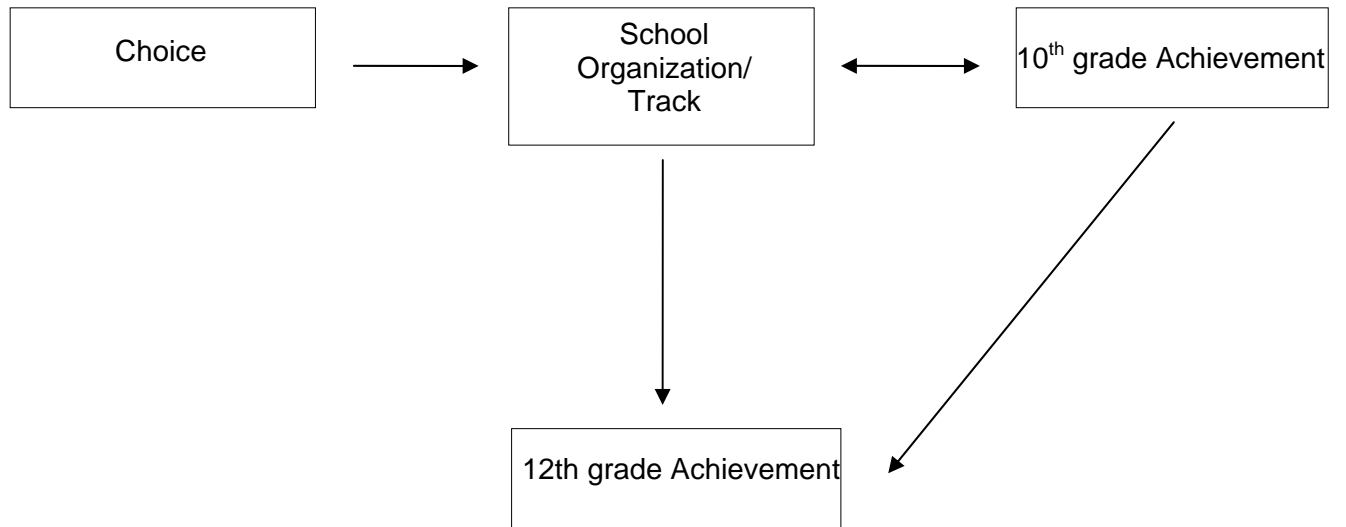
Figure 1.2: Conflict Model

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┌─────────────────┐                      ┌─────────────────┐
│     Choice      │────────┐             │   Achievement   │
└─────────────────┘         \            └─────────────────┘
    │        │               \
    │        │                \
    ▼        │                 ▼
┌─────────┐  │
│Diversity│  │
└─────────┘  │
    │        │
    ▼        ▼
┌─────────────────┐
│      Track      │─────────────►
└─────────────────┘
```
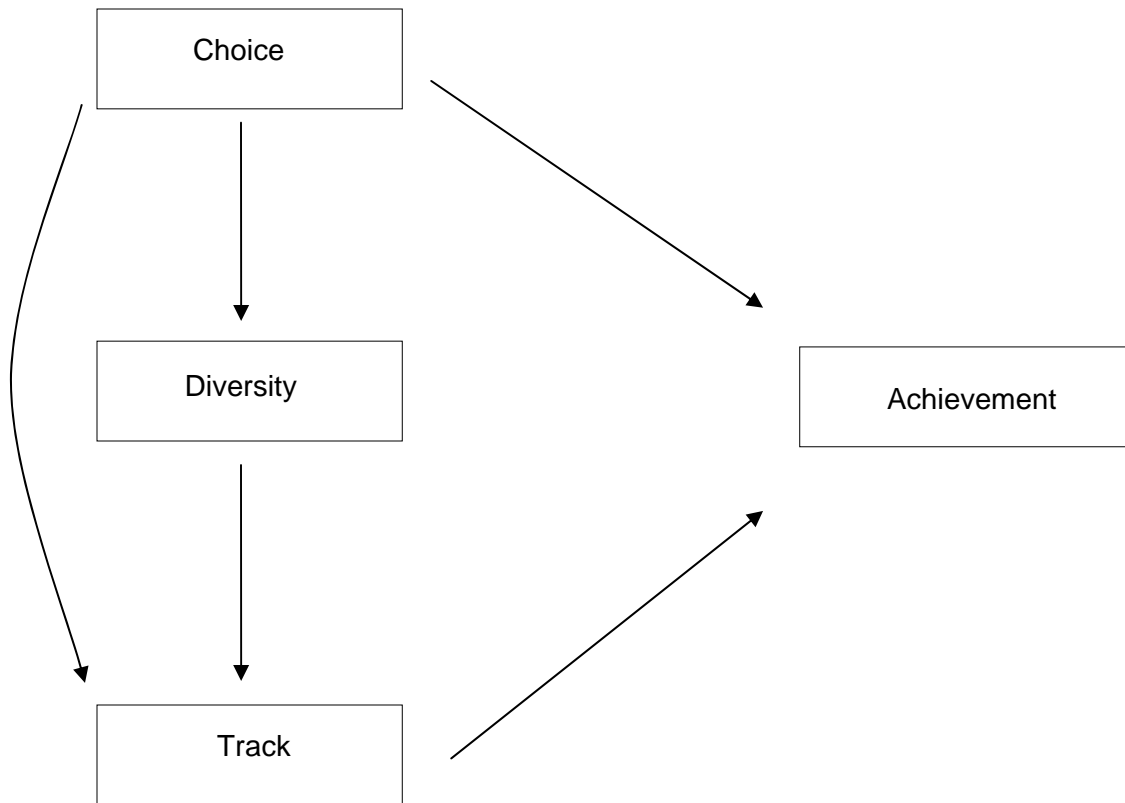
Figure 3.1: Graphical Representation of Research Questions

SCHOOL CHOICE ⟹ SCHOOL ORGANIZATION ⟹ SCHOOL ACHIEVEMENT

RQ 1, Part 1   **RQ 1, Part 2**

METHOD = OLS REGRESSION

CHAPTER FOUR

CHOICE

RACE / SES ⟹ ACHIEVEMENT, TRACK

RQ2

METHOD = HLM

CHAPTER FIVE

CHOICE ⟹ ORGANIZATION ⟹ ACHIEVEMENT   **RQ3**

VS.   **METHOD = SEM**

CHOICE ⟹ DIVERSITY ⟹ TRACKING ⟹ ACHIEVEMENT   **CHAPTER SIX**
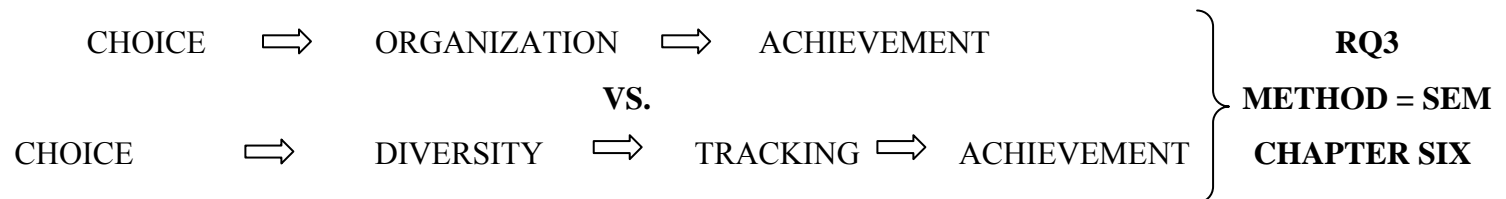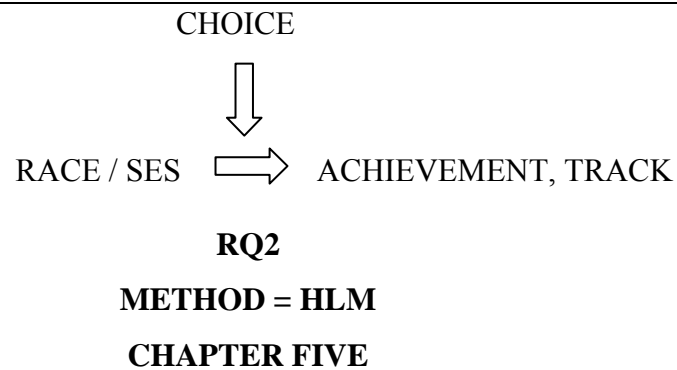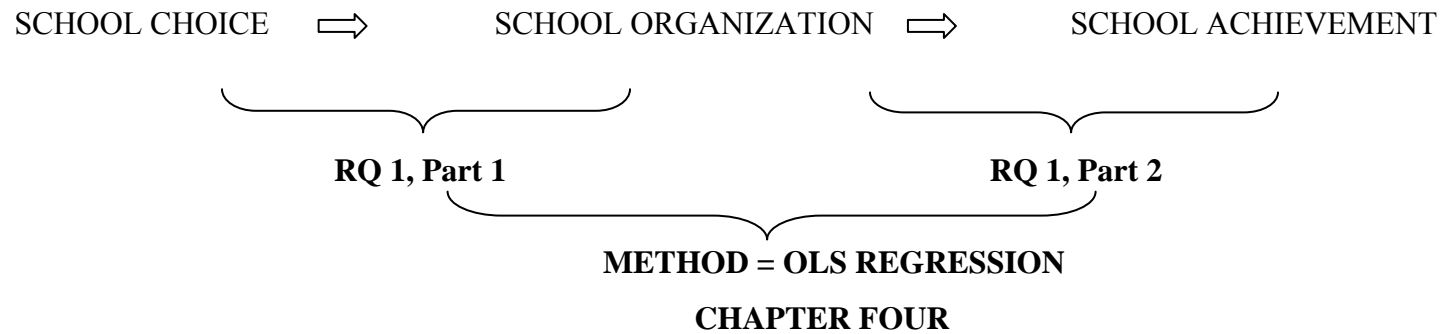
Table 3.1: Missingness on School Organization by School Type

	Mean	Number of Cases With Missing Values	Total N
Regular Public	.33	85	256
Magnet	.48	33	68
Other Public Choice	.27	44	165
Catholic	.33	30	91
Private	.26	15	57
Total	.32	207	637

Table 3.2: Logistic Regression Results for Missing at Random Analyses for School
        Organization Variable

	Coefficient	SE
Base Year Achievement	-.03	.02
Magnet	.28	.30
Other Public Choice	-.24	.23
Catholic	.22	.30
Private	-.08	.37
School SES	.21	.33
% Minority	.01***	.004
Urban	-.02	.21
Rural	-.12	.27
Constant	-.004	.87
N	625	

Table 3.3: Chubb and Moe's Measure of School Organization

SCHOOL ORGANIZATION COMPREHENSIVE MEASURE

Mean of:
1. Priority of academic excellence
2. Principal's motivation
3. Principal's Teaching esteem (Principal's dedication to teaching, estimated excellence of teachers)
4. Teacher professionalism (Teacher influence, teacher efficacy, teacher absenteeism)
5. Staff harmony (teacher collegiality, teacher cooperation, principal's vision)
6. Disciplinary fairness and effectiveness
7. Administrative routines in classroom
8. Graduation requirements
9. Homework assignments
10. Academic track enrollment

SCHOOL ORGANIZATION CONDENSED MEASURE

Mean of:
1. Priority of academic excellence
2. Principal's motivation
3. Teaching esteem
4. Teacher professionalism
5. Teacher cooperation
6. Disciplinary fairness and effectiveness
7. Academic track enrollment

Table 3.4: Components Comprising Chubb and Moe's Measure of School Organization (by Dimension)

	PERSONNEL DIMENSION	

Major Components		Measured by:
Teacher experience		% of teachers with 10+ years at same school
Teaching esteem		Mean – 1. principals dedication to teaching 2. teachers judged excellent by principal
Teachers judged excellent by principal		% teachers judged excellent by principal
Teacher professionalism (composite)		1. Mean (teacher influence, teacher efficacy, teacher absenteeism a problem)
	Teacher influence	1. teacher influence determining student behavior codes 2. teacher influence in determining the content of in-service programs 3. teacher influence in setting policy on grouping students by ability 4. teacher influence in establishing school curriculum 5. teacher control over disciplining students
	Teacher efficacy	1. success or failure in teaching students is beyond my control 2. feel it is a waste of time to do my best as a teacher
	Teacher absenteeism	1. person-days of substitute teaching per week/number of fulltime teachers 1984, 2. % of teachers on an average day, teacher absenteeism, teachers lack commitment or motivation
Staff harmony (composite)		Mean (Principals' vision, teacher collegiality, teacher cooperation)
	Teacher cooperation	1. teaching improvement aided by other teachers 2. time spent meeting with other teachers on lesson planning, curriculum, and so on 3. effort to coordinate course content with other teachers 4. familiar with the content and goals of courses taught by other teachers

Table 3.4 (continued): Components Comprising Chubb and Moe's Measure of School Organization (by Dimension)

PERSONNEL DIMENSION (continued)

Teacher collegiality	1.	participated in predominantly faculty social activities
	2.	can count on other staff members to help out
	3.	colleagues share beliefs and values about the central mission of the school
	4.	great deal of cooperative effort among staff members

PRACTICE DIMENSION

Major Components   Measured by:

Percent of students in academic track 10^{th} grade
Homework assignments   1. homework assigned in minutes
                                                                   2. mean number of writing assignments

Classroom administrative routines   Mean –
                                                                   1. routine duties and paperwork interfere with teaching
                                                                   2. hours spent completing forms and administrative paperwork
                                                                   3. % completed homework recorded
                                                                   4. % of homework graded or corrected and returned to students
                                                                   5. class time spent reviewing an exam
                                                                   6. class time spent reviewing a quiz

Disciplinary effectiveness and fairness   Mean –
                                                                   1. effective of discipline
                                                                   2. fairness of discipline

Coursework   Mean semesters of coursework completed (not required) in:
                                                                   1. English
                                                                   2. Foreign language
                                                                   3. History
                                                                   4. Math
                                                                   5. Science

Table 3.4 (continued): Components Comprising Chubb and Moe's Measure of School Organization (by Dimension)

GOALS DIMENSION	
Major Components	Measured by:
Graduation requirements	1. English graduation requirements 2. Math graduation requirements 3. Science graduation requirements 4. History graduation requirements 5. Foreign Language graduation requirements
Priority of academic excellence	1. Rank of literacy as a school goal 2. Rank of citizenship as a school goal 3. Rank of occupational skills as a school goal 4. Rank of work habits an self-discipline as a school goal 5. Rank of academic excellence as a school goal 6. Rank of personal growth as a school goal 7. Rank of human relations as a school goal 8. Rank of religious values as a school goal

LEADERSHIP DIMENSION	
Major Components	Measured by:
Principal's motivation (to control)	Mean - 1. preference for control (Min) a. became principal because of a desire for greater control over curriculum b. became principal because of a desire for greater control over personnel quality c. became principal because of a desire for greater control over other school policies 2. preference for career advancement a. became principal to further career

Table 3.4 (continued): Components Comprising Chubb and Moe's Measure of School Organization (by Dimension)

LEADERSHIP DIMENSION (continued)

Principal's dedication to teaching   Mean –
1. principal's teaching experience (years of teaching experience)
2. principal's administrative aspirations (desire to move into higher administrative position)

Principal's Vision   Mean –
1. teaching improvement aided by principal
2. principal sets priorities, makes plans, and sees that they are carried out
3. goals and priorities for the school are clear
4. principal knows what he wants and has communicated it to the staff
5. principal lets staff members know what is expected of them
6. principal is interested in innovation and new ideas

Table 3.5: Measures used to Construct School Organization Variable

Chubb & Moe Dimension	Variable	Measurement/Response Range	Wave
Leadership	Principal influence: hiring and firing teachers	"No influence" (1) to "major influence" (3)	BY
Leadership	Principal influence: establishing policies and priorities for grouping students into classes	" "	BY
Leadership	Principal influence: setting curricular guidelines	" "	BY
Leadership	Principal influence: establishing discipline policies	" "	BY
Leadership	Principal influence: deciding how school funds will be spent	" "	BY
Leadership	Principal influence: deciding what courses will be offered	" "	BY
Leadership	Principal influence: selecting textbooks and other instructional materials	" "	BY
Leadership	Principal influence: establishing policies and practices for grading and student evaluation	" "	BY
Personnel	Percentage of teachers in school principal considers excellent	%	F1
Personnel	There is often conflict between teachers and administrators	"Not at all accurate" (1) to "very accurate" (5)	BY, F1
Personnel	Teacher morale is generally high		F1
Personnel	Many teachers have a negative attitude about students		F1
Practice	Most teachers at this schools press students to achieve academically	" "	BY
Practice	Hours spent on homework	" "	BY, F1
Practice	Discipline is emphasized at this school	" "	F1
Practice	Classroom activities are highly structured	" "	F1
Practice	% students in academic track	%	BY, F1
Goals	Coursework required in Math for graduation	"Course not offered" (1) to "4 years required" (7)	F1

BY= Base Year, 2002; F1= First Follow-Up, 2004

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Figure 3.2: School Type Categorizations and Association

Public

Regular Public
Schools (N=256)

Choice

Magnet Schools
(N=68)

Private

Other Public Schools
of Choice (N=165)

Catholic Schools (N=91)

Non-Catholic Private
schools (N=57)
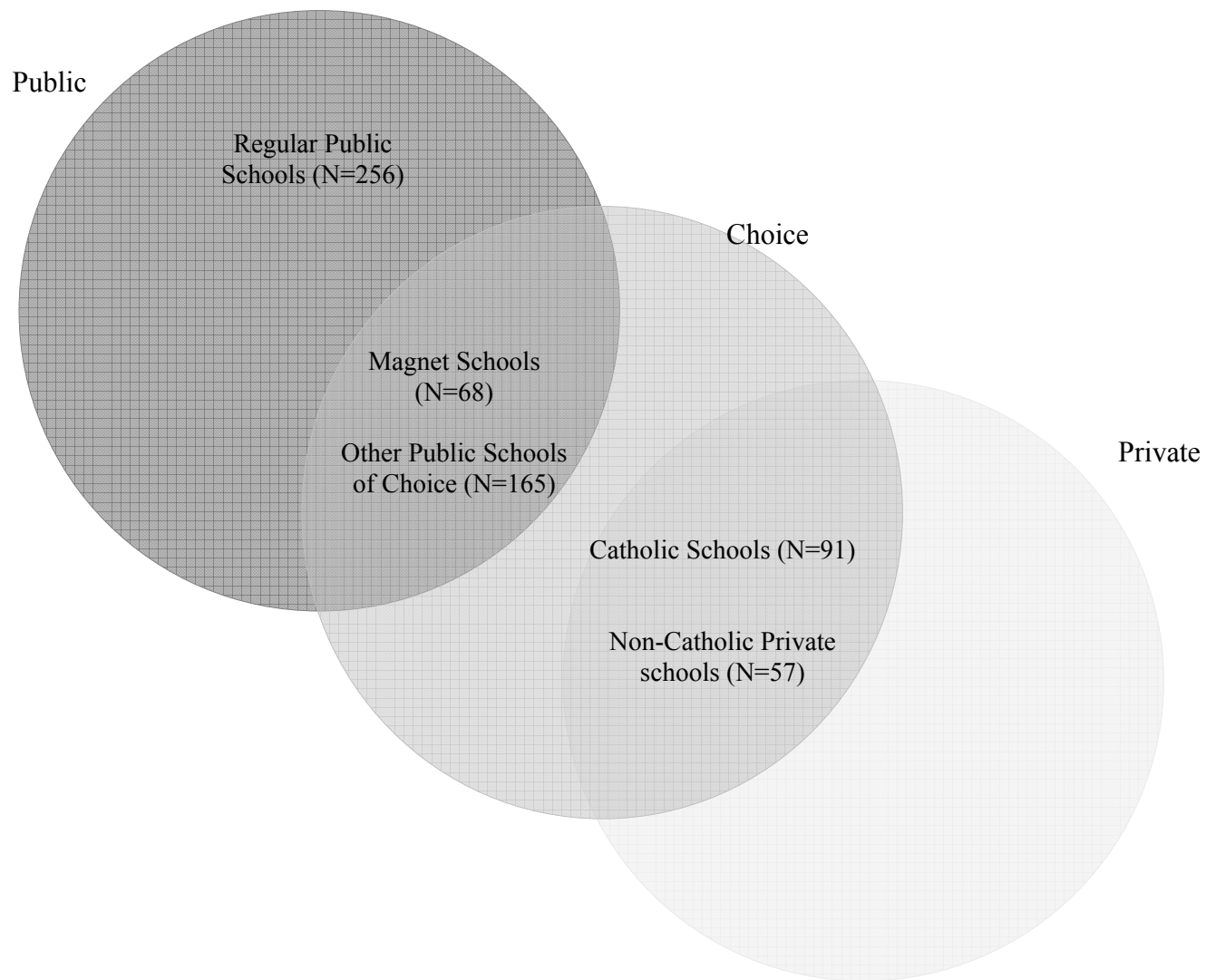
Table 4.1: Variables Used to Construct Poor Facilities and Behavioral Problems Indices

Index	Variable	Measurement/Response Range
Poor Facilities	Learning hindered by poor condition of buildings	"Not at all" (1) to "a lot" (4)
Poor Facilities	Learning hindered by poor heating/air/light	" "
Poor Facilities	Learning hindered by poor science labs	" "
Poor Facilities	Learning hindered by poor fine arts facilities	" "
Poor Facilities	Learning hindered by lack of space	" "
Poor Facilities	Learning hindered by poor library	" "
Poor Facilities	Learning hindered by lack of texts/supplies	" "
Poor Facilities	Learning hindered by too few computers	" "
Poor Facilities	Learning hindered by lack of multi-media	" "
Poor Facilities	Learning hindered by poor voc tech equipment/facilities	" "
Behavioral Problems	How often tardiness a problem at school	"Never happens" (1) to "Happens daily" (5) [a]
Behavioral Problems	How often absenteeism a problem at school	" "
Behavioral Problems	How often class cutting a problem at school	
Behavioral Problems	How often physical conflicts a problem at school	" "
Behavioral Problems	How often robbery/theft a problem at school	" "
Behavioral Problems	How often vandalism a problem at school	" "
Behavioral Problems	How often use of alcohol a problem at school	" "
Behavioral Problems	How often use of illegal drugs a problem at school	" "
Behavioral Problems	How often student on drugs/alcohol at school a problem	" "
Behavioral Problems	How often sale of drugs near school a problem	" "
Behavioral Problems	How often possession of weapons a problem at school	" "
Behavioral Problems	How often physical abuse of teachers a problem at school	" "
Behavioral Problems	How often a racial tension among students a problem at school	" "

[a] Recoded. Original coding as follows: happens daily=1, happens at least once a week=2, happens at least once a month=3, happens on occasion=4, never happens=5

Table 4.1 (continued): Variables Used to Construct Poor Facilities and Behavioral Problems Indices

Index	Variable	Measurement/Response Range	
Behavioral Problems	How often student bullying a problem at school	"	"
Behavioral Problems	How often verbal abuse of teachers a problem at school	"	"
Behavioral Problems	How often disorder in classrooms a problem at school	"	"
Behavioral Problems	How often student disrespect for teachers a problem at school	"	"
Behavioral Problems	How often gang activity a problem at school	"	"
Behavioral Problems	How often cult/extremist groups a problem at school	"	"

Table 4.2: Results of Confirmatory Factor Analysis Testing Four Factor Structure of School Organization [a]

Chubb & Moe Dimension	Variable	Factor Loadings			
		Factor 1	Factor 2	Factor 3	Factor 4
Leadership	Principal Influence: Hiring/firing teachers	**.50**	-.23	.003	-.04
Leadership	Principal Influence: On grouping students	**.51**	-.27	-.16	-.04
Leadership	Principal Influence: On course offerings	**.53**	-.20	-.24	.04
Leadership	Principal Influence: On instructional materials	**.52**	-.23	-.30	-.04
Leadership	Principal Influence: On curricular guidelines	**.57**	-.25	-.22	-.008
Leadership	Principal Influence: On grading and evaluation	**.62**	-.21	-.22	-.05
Leadership	Principal Influence: On discipline policies	**.50**	-.20	-.13	-.01
Leadership	Principal Influence: On school funds	**.34**	-.18	-.11	.04
Practice	Teachers press students to achieve	**.54**	.17	.37	.10
Practice	Discipline is emphasized at this school	**.33**	.20	.31	-.18
Practice	Classroom activities are highly structured	**.35**	.15	.29	-.15
Practice	Hours spent on homework (in & out of school)	**.09**	-.28	.34	.48
Practice	Percentage of students in college/academic track	**.35**	.11	.17	.22
Practice	Math homework	**-.03**	-.22	.18	.50
Personnel	Teacher morale is high	**.49**	.18	.27	.08
Personnel	Percentage of teachers principals considers excellent	**.30**	.12	.27	-.05
Personnel	Many teachers have a negative attitude about students	**.39**	.09	.41	-.19
Personnel	There is often conflict between teaches and administrators	**.40**	.15	.26	-.16
Goals	Math requirements for graduation	**.26**	.70	-.32	.14
Goals	English requirements for graduation	.14	.43	-.10	.09
Goals	Science requirements for graduation	.23	.73	-.28	.14
Goals	History requirements for graduation	.16	.37	-.20	.10

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[a] Loadings in bold indicate variables used in construction of school organization index.

Table 4.3: School-Level Descriptive Statistics by School Type

	Regular Public	Magnet	Other Public Choice	Catholic	Private	Total
Math Achievement Gain	4.79	4.94	4.57	6.58	6.32	5.14
School Organization	-.22	-.24	-.12	.65	.62	-9.71^{-11}
10th Grade Math Achievement (Aggregate)	41.96	41.03	41.59	48.51	47.42	43.19
% in Academic Track	56.36	58.00	49.7	85.54	72.64	60.43
Poor Facilities	1.84	1.97	1.71	1.58	1.60	1.76
Behavioral Problems	2.46	2.48	2.45	2.02	1.87	2.34
SES (Aggregate)	-.02	-.08	-.06	.45	.43	.07
% Minority	34.13	62.81	30.79	21.72	16.90	33.01
N	256	68	165	91	57	637

Table 4.4: Unstardardized OLS Regression Results Testing the Effects of School Type and Other School Characteristics on School-Level Organization[a] (N=637)

	1		2		3	
	b	SE	b	SE	b	SE
10th Grade Math Achievement (Aggregate)	.04***	.007	.02*	.009	.02**	.009
Magnet	.02	.16	.06	.17	.08	.16
Other Public Choice	.12	.11	.09	.10	.16	.11
Catholic	.61***	.13	.32*	.15	.61***	.15
Private	.62***	.15	.23	.19	.59***	.15
Poor Facilities	-	-	-.40***	.06	-	-
Behavioral Problems	-	-	-.49**	.16	-	-
School SES	-	-	.34*	.15	.30*	.16
% Minority	-	-	.001	.002	-.0007	.002
Rural	-	-	.03	.15	.11	.14
Suburban	-	-	.06	.09	.09	.09
Midwest	-	-	-.13	.11	-.25*	.12
West	-	-	-.06	.13	-.17	.14
South	-	-	.05	.11	.01	.12
Constant	-1.93**	.32	.89	.68	-1.28**	.43
Adjusted R^2	.19		.32		.21	

*** p ≤.001, ** p ≤ .01, * p ≤ .05, + p ≤ .10

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[a] Results of 5 imputed data sets.

Table 4.5: Unstardardized OLS Regression Results Testing the Effects of School Type and Other School Characteristics on School-Level Math Achievement Gains [a] (N=637)

	1		2		3	
	b	SE	b	SE	b	SE
School Organization	-	-	.06	.11	.05	.13
10th Grade Math Achievement (Aggregate)	.03***	.01	.04**	.01	-.008	.02
Magnet	.18	.26	.18	.26	-.09	.27
Other Public Choice	-.21	.19	-.22	.19	.-14	.19
Catholic	1.53***	.25	1.49***	.26	.99***	.29
Private	1.31***	.29	1.26 **	.30	.69**	.33
Poor Facilities	-	-	-	-	.24+	.13
Behavioral Problems	-	-	-	-	-.31	.15
School SES	-	-	-	-	1.60***	.29
% Minority	-	-	-	-	.005	.003
Rural	-	-	-	-	-.28	.26
Suburban	-	-	-	-	-.22	.18
Midwest	-	-	-	-	-.09	.24
West	-	-	-	-	.44+	.26
South	-	-	-	-	.08	.23
Constant	3.12	.49	3.26***	.54	5.45***	1.02
Adjusted R^2	.14		.14		.19	

*** p ≤.001, ** p ≤ .01, * p ≤ .05 , + p ≤ .10

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[a] Results of 5 imputed data sets.

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Appendix 4.1: School-Level Descriptive Statistics by School Type with Listwise Deletion

	Regular Public	Magnet	Other Public Choice	Catholic	Private	Total
Math Achievement Gain (Aggregate)	4.79	4.94	4.57	6.58	6.32	5.14
School Organization	-.22	-.24	-.12	.65	.62	-9.71^{-11}
10th Grade Math Achievement (Aggregate)	41.96	41.03	41.59	48.51	47.42	43.19
% in Academic Track	56.36	58.00	49.7	85.54	72.64	60.43
Poor Facilities	1.84	1.97	1.71	1.58	1.60	1.76
Behavioral Problems	2.46	2.48	2.45	2.02	1.87	2.34
SES (Aggregate)	-.02	-.08	-.06	.45	.43	.07
% Minority	34.13	62.81	30.79	21.72	16.90	33.01
N	256	68	165	91	57	637

Appendix 4.2.: Unstardardized OLS Regression Results Testing the Effects of School Type and Other School Characteristics on School-Level Organization with Listwise Deletion (N=390)

	b	SE
10th Grade Math Achievement (Aggregate)	.03**	.009
Magnet	-.14	.18
Other Public Choice	.03	.10
Catholic	.36*	.16
Private	.38*	.18
School SES	.16	.17
% Minority	.001	.002
Rural	-.007	.14
Suburban	.06	.10
Midwest	-.04	.13
West	-.06	.15
South	.14	.13
Poor Facilities	-.38***	.07
Behavioral Problems	-.42***	.13
Constant	.21	.57
Adjusted R^2	.30	

Appendix 4.3: Unstardardized OLS Regression Results Testing the Effects of School Type and Other School Characteristics on School-Level Math Achievement Gains with Listwise Deletion (N=385)

	b	SE
School Organization	.03	.12
10th Grade Math Achievement (Aggregate)	-.003	.02
Magnet	-.07	.43
Other Public Choice	.04	.24
Catholic	1.09**	.39
Private	-.09	.43
School SES	1.88***	.39
% Minority	.008	.005
Rural	-.21	.33
Suburban	-.07	.24
Midwest	.13	.31
West	.72*	.35
South	.30	.30
Poor Facilities	.27	.18
Behavioral Problems	-.33	.31
Constant	4.74***	1.33
Adjusted R^2	.18	

Table 5.1: Student Math IRT Gains by Race and School Type

	White	Black	Latino	Asian	Total
REGULAR PUBLIC					
Mean	4.80	4.45	4.86	6.36	4.91
SD	6.22	5.17	5.53	6.17	6.01
N	2088	406	483	298	3275
MAGNET					
Mean	4.94	4.48	5.22	5.93	5.06
SD	6.11	5.76	6.42	5.24	5.97
N	246	186	178	126	736
OTHER PUBLIC CHOICE					
Mean	4.72	4.62	4.51	5.98	4.79
SD	6.00	5.58	5.94	6.79	6.04
N	1386	201	344	206	2137
CATHOLIC					
Mean	6.87	5.91	7.07	7.01	6.83
SD	5.70	5.82	6.70	7.51	5.91
N	1044	93	170	49	1356
PRIVATE					
Mean	6.39	6.92	6.94	7.16	6.48
SD	6.34	4.66	7.65	5.64	6.30
N	640	35	36	36	747
TOTAL					
Mean	5.38	4.74	5.18	6.26	5.35
SD	6.14	5.46	6.08	6.27	6.08
N	5404	921	1211	715	8251

Table 5.2: Student Math IRT Gains by SES Quartile and School Type

	Lowest Quartile	Second Quartile	Third Quartile	Highest Quartile	Total
REGULAR PUBLIC					
Mean	4.78	4.25	5.08	5.49	4.91
SD	5.76	6.39	5.80	6.02	6.01
N	788	800	830	857	3275
MAGNET					
Mean	4.34	4.71	5.18	5.85	5.06
SD	6.00	5.34	6.20	6.15	5.97
N	179	167	182	208	736
OTHER PUBLIC CHOICE					
Mean	3.73	4.72	5.07	5.74	4.79
SD	6.01	5.88	6.10	6.02	6.04
N	537	541	563	496	2137
CATHOLIC					
Mean	4.62	5.89	6.75	7.38	6.83
SD	6.20	5.91	6.20	5.66	5.91
N	68	224	352	712	1356
PRIVATE					
Mean	5.38	5.11	5.72	7.12	6.48
SD	6.59	6.08	5.57	6.53	6.30
N	31	86	180	450	747
TOTAL					
Mean	4.38	4.68	5.42	6.33	5.35
SD	5.92	6.09	5.99	6.08	6.08
N	1603	1818	2107	2723	8251

Table 5.3: HLM Results for 12th grade Math Achievement as a function of Public and Private School Choice and Other School Characteristics

	12th Grade Math Achievement	
Fixed Effect		
	Coefficient	SE
Base		
Intercept	50.80***	0.40
% MINORITY	-0.05***	0.01
SCHOOL SES	12.38***	0.67
PUBLIC CHOICE	0.12	0.49
PRIVATE CHOICE	-0.18	0.66
SCHOOL ORGANIZATION	0.55*	0.24
10th Grade Math Score		
Intercept	0.98***	0.01
% MINORITY	0.0004*	0.0002
SCHOOL SES	-0.07***	0.02
PUBLIC CHOICE	-0.02+	0.01
PRIVATE CHOICE	-0.04*	0.02
SCHOOL ORGANIZATION	-0.01*	0.01
SES		
Intercept	0.53*	0.27
% MINORITY	-0.004	0.004
SCHOOL SES	-0.05	0.37
PUBLIC CHOICE	0.97***	0.27
PRIVATE CHOICE	0.51+	0.36
SCHOOL ORGANIZATION	0.13	0.13
Black (vs. White)		
Intercept	-1.01+	0.66
% MINORITY	0.01	0.01
SCHOOL SES	0.19	0.78
PUBLIC CHOICE	0.70	0.61
PRIVATE CHOICE	0.67	0.77
SCHOOL ORGANIZATION	0.09	0.30
Latino (vs. White)		
Intercept	-0.92+	0.62
% MINORITY	0.01	0.01
SCHOOL SES	-0.07	0.95
PUBLIC CHOICE	0.56	0.63
PRIVATE CHOICE	0.31	0.87
SCHOOL ORGANIZATION	-0.19	0.29

Table 5.3 (continued): HLM Results for 12th grade Math Achievement as a function of Public and Private School Choice and Other School Characteristics

	12th Grade Math Achievement	
	Coefficient	SE
Asian (vs. White)		
Intercept	1.35*	0.70
% MINORITY	-0.002	0.01
SCHOOL SES	0.29	0.83
PUBLIC CHOICE	0.96+	0.70
PRIVATE CHOICE	-0.65	1.01
SCHOOL ORGANIZATION	0.22	0.31
Female (vs. Male)	-0.54***	0.15
Public Choice Propensity	3.55+	2.74
Private Choice Propensity	2.25**	0.94
Level-1 N	8251	
Level-2 N	633	

Figure 5.1: Effect of Public and Private Choice on the SES-Math Achievement
Relationship
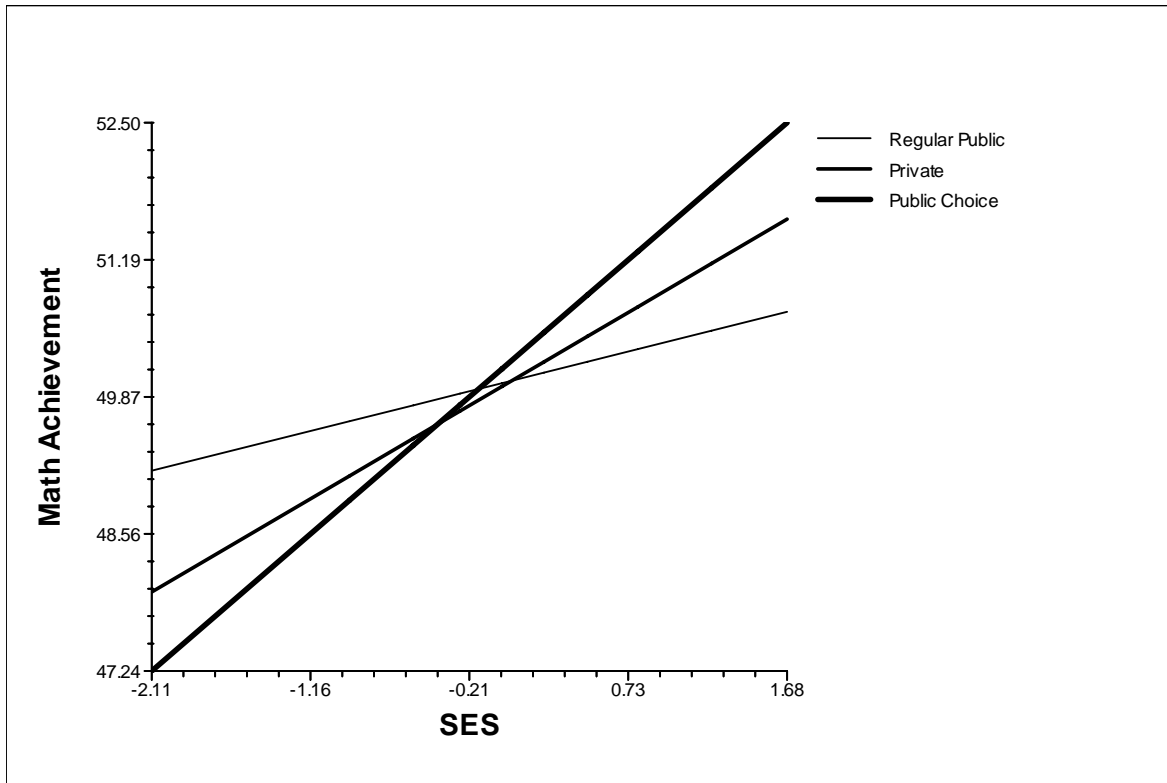
Figure 5.3: Curriculum Concentration by Race and School Type

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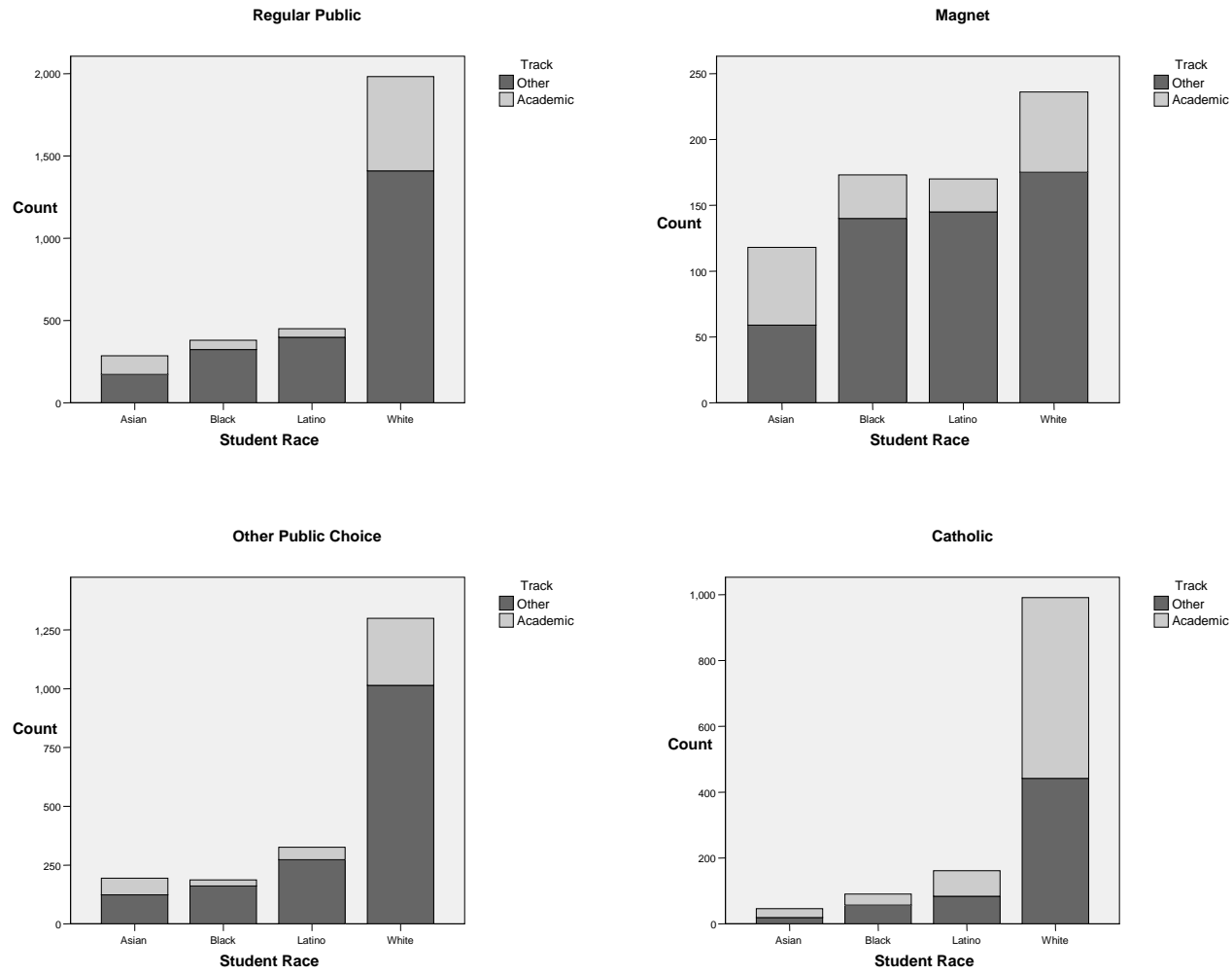
Figure 5.3 (continued): Curriculum Concentration by Race and School Type
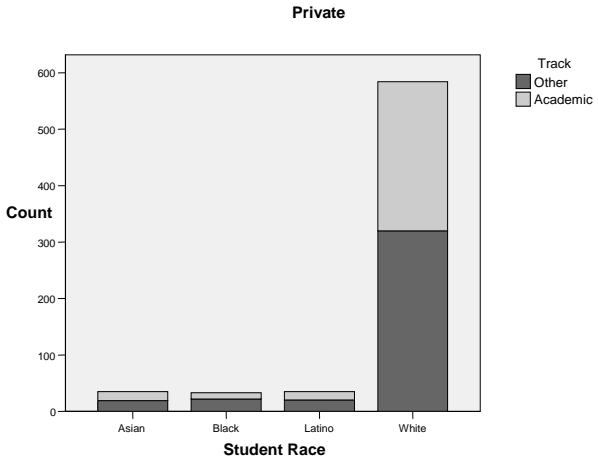
Private

Figure 5.4: Curriculum Concentration by SES Quartile and School Type
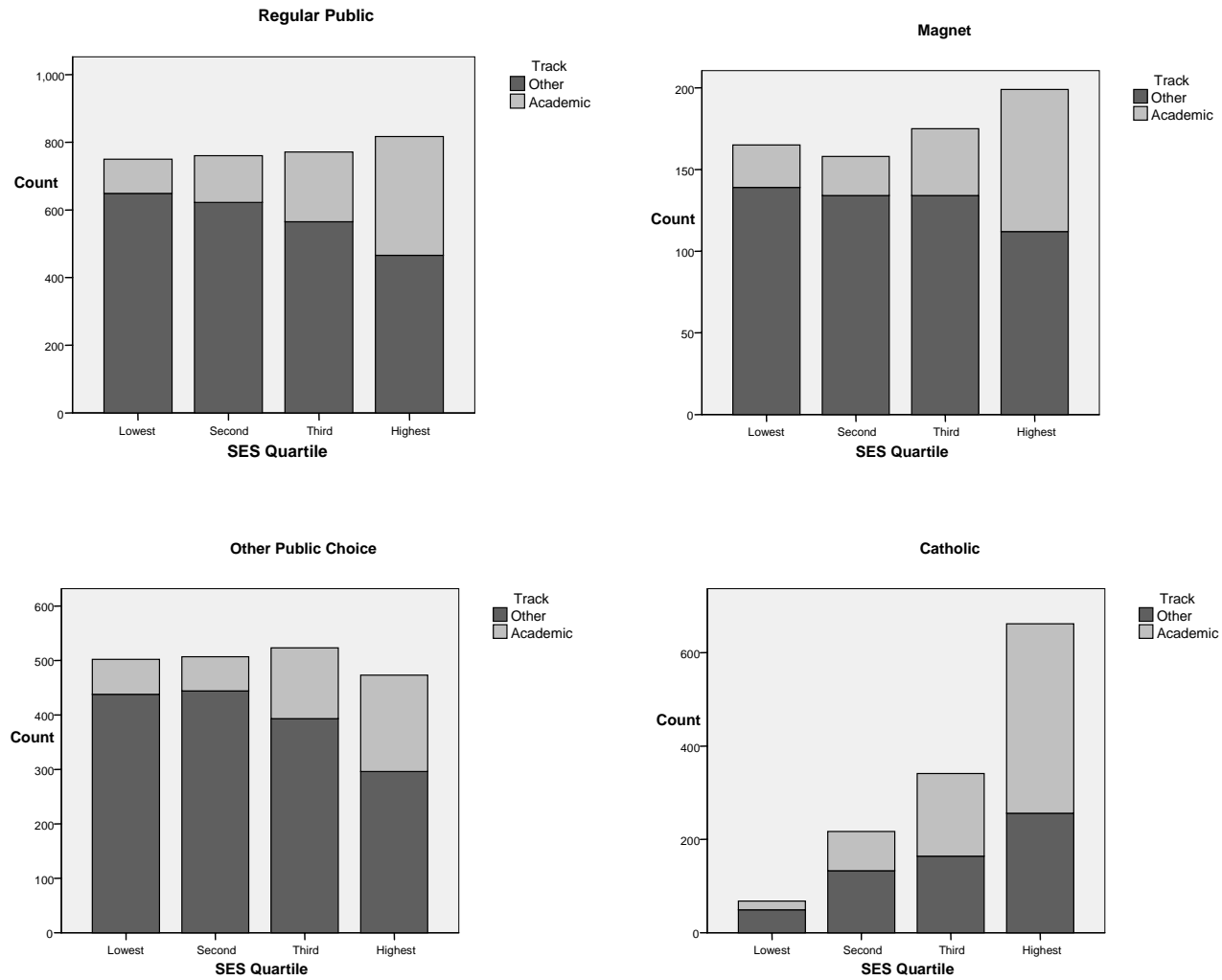
Figure 5.4 (continued): Curriculum Concentration by SES Quartile and School Type
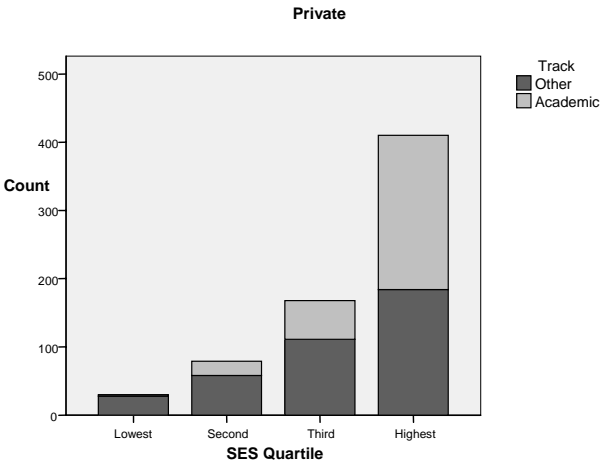
Private

Table 5.4: HLM Results for Curriculum Concentration as a function of Public and Private School Choice and Other School Characteristics

	Curriculum Concentration	
Fixed Effect		
	Coefficient	SE
Base		
Intercept	-2.03***	0.06
% MINORITY	0.004+	0.002
% IN ACADEMIC TRACK	0.01**	0.002
SCHOOL SES	1.68***	0.17
PUBLIC CHOICE	-0.18	0.13
PRIVATE CHOICE	0.34*	0.16
SCHOOL ORGANIZATION	0.06	0.08
10th Grade Math Score		
Intercept	0.10***	0.01
% MINORITY	-0.0003+	0.0001
% IN ACADEMIC TRACK	-0.0003+	0.0001
SCHOOL SES	-0.03***	0.01
PUBLIC CHOICE	-0.004	0.01
PRIVATE CHOICE	0.01+	0.01
SCHOOL ORGANIZATION	-0.00005	0.004
SES		
Intercept	0.20	0.17
% MINORITY	-0.005*	0.002
% IN ACADEMIC TRACK	0.002	0.002
SCHOOL SES	0.03	0.18
PUBLIC CHOICE	0.10	0.13
PRIVATE CHOICE	-0.26*	0.15
SCHOOL ORGANIZATION	-0.02	0.07
Black (vs. White)		
Intercept	0.91*	0.50
% MINORITY	-0.01+	0.01
% IN ACADEMIC TRACK	-0.01	0.01
SCHOOL SES	-0.42	0.42
PUBLIC CHOICE	0.06	0.31
PRIVATE CHOICE	0.25	0.35
SCHOOL ORGANIZATION	-0.06	0.17
Latino (vs. White)		
Intercept	0.58	0.43
% MINORITY	-0.002	0.01
% IN ACADEMIC TRACK	-0.01*	0.005
SCHOOL SES	-0.37	0.40
PUBLIC CHOICE	0.20	0.30
PRIVATE CHOICE	0.83*	0.37

Table 5.4 (continued): HLM Results for Curriculum Concentration as a function of Public and Private School Choice and Other School Characteristics

	Curriculum Concentration	
	Coefficient	SE
SCHOOL ORGANIZATION	-0.25*	0.15
Asian (vs. White)		
Intercept	1.13**	0.48
% MINORITY	-0.002	0.01
% IN ACADEMIC TRACK	-0.001	0.01
SCHOOL SES	-1.10**	0.36
PUBLIC CHOICE	0.11	0.28
PRIVATE CHOICE	0.30	0.38
SCHOOL ORGANIZATION	0.13	0.16
Gender	0.45***	0.07
Public Choice Propensity	-1.32	1.31
Private Choice Propensity	0.76*	0.43
Level-1 N	7775	
Level-2 N	624	

Table 5.5: Student Total AP/IB Course-Taking by Race and School Type (in Carnegie Units)

	WHITE	BLACK	LATINO	ASIAN/PI	TOTAL
REGULAR PUBLIC					
Mean	.83	.28	.60	2.06	.84
SD	1.71	.87	1.46	2.59	1.75
Min	0	0	0	0	0
Max	14	8.5	12	13	14
N	1982	380	450	286	3098
MAGNET					
Mean	1.34	.46	.66	3.04	1.25
SD	2.13	1.17	1.68	3.34	2.23
Min	0	0	0	0	0
Max	13	8	7	15	15
N	236	173	170	118	697
OTHER PUBLIC CHOICE					
Mean	.70	.35	.59	1.96	.77
SD	1.43	1.02	1.48	2.67	1.62
Min	0	0	0	0	0
Max	11	8	12	11.5	12
N	1299	187	325	194	2005
CATHOLIC					
Mean	1.03	.66	.89	2.04	1.02
SD	1.72	1.59	1.57	2.59	1.74
Min	0	0	0	0	0
Max	9	9	7	9	9
N	991	90	161	46	1288
PRIVATE					
Mean	1.01	.92	.63	1.32	1.00
SD	1.75	1.93	1.24	2.18	1.76
Min	0	0	0	0	0
Max	9	6.25	6	7.5	9
N	584	33	35	35	687
TOTAL					
Mean	.88	.39	.65	2.16	.90
SD	1.68	1.12	1.46	2.76	.1.77
Min	0	0	0	0	0
Max	14	9	12	15	15
N	5092	863	1141	679	7775

Table 5.6: Student Total AP/IB Course-Taking by SES Quartile and School Type (in Carnegie Units)

	LOWEST	SECOND	THIRD	HIGHEST	TOTAL
REGULAR PUBLIC					
Mean	.43	.43	.67	1.76	.84
SD	1.24	1.22	1.39	2.41	1.75
Min	0	0	0	0	0
Max	12	11	9	14	14
N	750	760	771	817	3098
MAGNET					
Mean	.72	.51	1.25	2.26	1.24
SD	1.66	1.39	2.04	2.89	2.23
Min	0	0	0	0	0
Max	11.5	10	9.5	15	15
N	165	158	175	199	697
OTHER PUBLIC CHOICE					
Mean	.34	.37	.82	1.6	.77
SD	1.00	1.12	1.6	2.21	1.65
Min	0	0	0	0	0
Max	9	11.5	9.5	12	12
N	502	507	523	473	2005
CATHOLIC					
Mean	.44	.41	.77	1.41	1.02
SD	.69	1.06	1.52	1.98	1.74
Min	0	0	0	0	0
Max	4	8	8	9	9
N	68	217	341	662	1288
PRIVATE					
Mean	0	.33	.48	1.42	1.00
SD	0	.87	1.28	1.98	1.76
Min	0	0	0	0	0
Max	0	5	9	9	9
N	30	79	168	410	687
TOTAL					
Mean	.42	.41	.76	1.62	.90
SD	1.20	1.18	1.54	2.26	.1.77
Min	0	0	0	0	0
Max	12	11.5	9.5	15	15
N	1515	1721	1978	2561	7775

Table 5.7: HLM Results for Total AP/IB Course-Taking (in Carnegie Units) as a
function of Public and Private School Choice and Other School Characteristics

	Total AP Course-Taking	
Fixed Effect	Coefficient	SE
Base		
Intercept	0.60***	0.06
% MINORITY	0.01***	0.001
SCHOOL SES	1.45***	0.12
PUBLIC CHOICE	-0.02	0.07
PRIVATE CHOICE	-0.51***	0.10
SCHOOL ORGANIZATION	0.02	0.04
10th Grade Math Score		
Intercept	0.04***	0.004
% MINORITY	0.001***	0.001
SCHOOL SES	0.05***	0.01
PUBLIC CHOICE	-0.01	0.004
PRIVATE CHOICE	-0.02**	0.01
SCHOOL ORGANIZATION	0.001	0.002
SES		
Intercept	0.21***	0.06
% MINORITY	0.001	0.001
SCHOOL SES	0.24*	0.12
PUBLIC CHOICE	0.06	0.07
PRIVATE CHOICE	-0.32***	0.10
SCHOOL ORGANIZATION	0.01	0.04
Black (vs. White)		
Intercept	0.11	0.13
% MINORITY	-0.004	0.003
SCHOOL SES	0.37*	0.21
PUBLIC CHOICE	0.05	0.13
PRIVATE CHOICE	0.05	0.21
SCHOOL ORGANIZATION	-0.03	0.08
Latino (vs. White)		
Intercept	0.31*	0.14
% MINORITY	-0.004*	0.003
SCHOOL SES	-0.17	0.19
PUBLIC CHOICE	-0.22+	0.14
PRIVATE CHOICE	-0.01	0.21
SCHOOL ORGANIZATION	-0.09	0.07

Table 5.7 (continued): HLM Results for Total AP/IB Course-Taking as a function of Public and Private School Choice and Other School Characteristics

	Total AP Course-Taking	
	Coefficient	SE
Asian (vs. White)		
Intercept	0.99***	0.20
% MINORITY	-0.002	0.004
SCHOOL SES	0.72**	0.27
PUBLIC CHOICE	-0.23	0.23
PRIVATE CHOICE	-0.39+	0.30
SCHOOL ORGANIZATION	0.11	0.13
Female (vs. Male)	0.26***	0.03
Public Choice Propensity	2.12***	0.65
Private Choice Propensity	1.69***	0.27
Level-1 N	7775	
Level-2 N	624	

Appendix 5.1: 10th and 12th Grade Student Math IRT Scores by Race and School Type

	White 10th	White 12th	Black 10th	Black 12th	Latino 10th	Latino 12th	Asian 10th	Asian 12th	Total 10th	Total 12th
REGULAR PUBLIC										
Mean	47.09	51.89	34.42	38.87	36.23	41.08	48.29	54.65	44.02	48.93
SD	12.88	14.03	11.14	12.49	12.53	13.53	15.36	16.08	13.92	15.02
N	2088	2088	406	406	483	483	298	298	3275	3275
MAGNET										
Mean	49.48	54.41	36.67	41.14	38.31	43.52	53.62	59.55	44.25	49.31
SD	13.36	14.62	11.49	12.33	13.39	14.11	15.84	15.71	15.03	15.85
N	246	246	186	186	178	178	126	126	736	736
OTHER PUBLIC CHOICE										
Mean	46.33	51.05	33.35	37.97	36.26	40.77	47.96	53.94	43.65	48.45
SD	12.99	13.94	10.05	11.97	12.49	13.59	14.70	15.49	13.78	14.80
N	1386	1386	201	201	344	344	206	206	2137	2137
CATHOLIC										
Mean	50.81	57.67	41.59	47.50	45.48	52.55	52.88	59.89	49.58	56.41
SD	11.49	12.33	12.83	14.57	11.27	12.19	11.77	12.07	11.97	12.81
N	1044	1044	93	93	170	170	49	49	1356	1356
PRIVATE										
Mean	51.75	58.14	43.46	50.39	46.54	53.49	54.19	61.35	51.23	57.71
SD	12.61	13.25	13.87	15.28	12.13	13.98	11.55	12.14	12.80	13.47
N	640	640	35	35	36	36	36	36	747	747
TOTAL										
Mean	48.27	53.65	35.71	40.44	38.15	43.33	49.75	56.01	45.51	50.86
SD	12.82	13.93	11.60	12.10	12.95	14.13	15.03	15.60	13.86	14.98
N	5404	5404	921	921	1211	1211	715	715	8251	8251

Appendix 5.2: 10[th] and 12[th] Grade Student Math IRT Scores by SES Quartile and School Type

	Lowest Quartile		Second Quartile		Third Quartile		Highest Quartile		Total	
	10[th]	12[th]	10[th]	12[th]	10[th]	12[th]	10[th]	12[th]	10[th]	12th
REGULAR PUBLIC										
Mean	36.65	41.43	41.30	45.55	45.56	50.64	51.85	57.34	44.02	48.93
SD	12.36	13.55	12.46	14.04	13.01	13.77	13.08	13.79	13.91	15.02
N	788	788	800	800	830	830	857	857	3275	3275
MAGNET										
Mean	37.83	42.78	39.40	44.10	45.12	50.30	52.90	58.75	44.25	49.31
SD	13.59	14.24	14.11	14.93	14.05	14.25	13.43	14.31	15.03	15.85
N	179	179	167	167	182	182	208	208	736	736
OTHER PUBLIC CHOICE										
Mean	36.27	39.40	40.80	45.52	46.68	51.75	51.30	57.03	43.65	48.45
SD	12.31	13.19	12.60	13.68	13.08	13.98	12.27	12.59	13.78	14.80
N	537	537	541	541	563	563	496	496	2137	2137
CATHOLIC										
Mean	41.30	45.93	44.94	50.84	48.57	55.31	52.33	59.71	49.58	56.41
SD	11.06	12.79	11.52	12.56	11.41	12.65	11.59	11.71	11.97	12.81
N	68	68	224	224	352	352	712	712	1356	1356
PRIVATE										
Mean	38.94	44.33	46.18	51.29	48.14	53.86	54.27	61.39	51.23	57.71
SD	11.18	12.89	12.05	12.88	12.80	14.12	11.95	11.81	12.80	13.47
N	31	31	86	86	180	180	450	450	747	747
TOTAL										
Mean	36.90	41.28	41.65	46.33	46.54	51.96	52.35	58.68	45.51	50.86
SD	12.44	13.51	12.64	13.94	12.90	13.82	12.43	12.87	13.86	14.98
N	1603	1603	1818	1818	2107	2107	2723	2723	8251	8251

Appendix 5.3: HLM Results for Math Achievement Gains as a function of Public and Private School Choice and Other School Characteristics [a]

	Achievement Gain	
Fixed Effect	Coefficient	SE
Base		
Intercept	4.64***	0.16
% MINORITY	0.009***	0.003
SCHOOL SES	1.40***	0.25
PUBLIC CHOICE	-0.07	0.18
PRIVATE CHOICE	1.20***	0.26
SCHOOL ORGANIZATION	-0.02	0.09
10th Grade Math Score		
Intercept	-0.02*	0.01
% MINORITY	-0.0004*	0.0002
SCHOOL SES	-0.07***	0.02
PUBLIC CHOICE	-0.02	0.01
PRIVATE CHOICE	-0.04*	0.02
SCHOOL ORGANIZATION	-0.014*	0.006
SES		
Intercept	0.52+	0.27
% MINORITY	-0.003	0.004
SCHOOL SES	-0.03	0.37
PUBLIC CHOICE	0.98***	0.27
PRIVATE CHOICE	0.54	0.35
SCHOOL ORGANIZATION	0.08	0.12
Black (vs. White)		
Intercept	-1.04	0.66
% MINORITY	0.008	0.01
SCHOOL SES	0.12	0.78
PUBLIC CHOICE	0.71	0.61
PRIVATE CHOICE	0.64	0.77
SCHOOL ORGANIZATION	0.19	0.30
Latino (vs. White)		
Intercept	-0.94	0.63
% MINORITY	0.01	0.01
SCHOOL SES	-0.22	0.94
PUBLIC CHOICE	0.56	0.64
PRIVATE CHOICE	0.10	0.88

[a] Results for 1 imputed data set

Appendix 5.3 (continued): HLM Results for Math Achievement Gains as a function of Public and Private School Choice and Other School Characteristics

	Achievement Gain	
	Coefficient	SE
SCHOOL ORGANIZATION	0.11	0.27
Asian (vs. White)		
Intercept	1.32+	0.70
% MINORITY	-0.003	0.01
SCHOOL SES	0.16	0.82
PUBLIC CHOICE	0.98	0.69
PRIVATE CHOICE	-0.70	1.00
SCHOOL ORGANIZATION	0.46	0.31
Female (vs. Male)	-0.54***	0.14
Public Choice Propensity	3.55	2.74
Private Choice Propensity	2.23**	0.94
Level-1 N	8251	
Level-2 N	633	

Appendix 5.4: Student Math AP/IB Course-Taking by Race and School Type [a]

	WHITE	BLACK	LATINO	ASIANPI	TOTAL
REGULAR PUBLIC					
Mean	.15	.05	.07	.41	.15
SD	.44	.29	.31	.67	.44
Min	0	0	0	0	0
Max	3.5	3	2	4.5	4.5
N	1982	380	450	286	3098
MAGNET					
Mean	.24	.06	.12	.53	.21
SD	.53	.27	.36	.75	.51
Min	0	0	0	0	0
Max	3	2	2	3	3
N	236	173	170	118	697
OTHER PUBLIC CHOICE					
Mean	.11	.06	.08	.41	.13
SD	.35	.26	.35	.67	.39
Min	0	0	0	0	0
Max	3	2	3	3	3
N	1299	187	325	194	2005
CATHOLIC					
Mean	.16	.04	.12	.42	.15
SD	.40	.21	.33	.67	.40
Min	0	0	0	0	0
Max	3	1	1.5	3	3
N	991	90	161	46	1288
PRIVATE					
Mean	.19	.12	.08	.4	.19
SD	.44	.33	.28	.65	.44
Min	0	0	0	0	0
Max	2	1	1	2	2
N	584	33	35	35	687
TOTAL					
Mean	.15	.06	.09	.43	.90
SD	.42	.27	.33	.68	1.77
Min	0	0	0	0	0
Max	3.5	3	3	4.5	15
N	5092	863	1141	679	7775

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[a] Results for 1 imputed data set

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Appendix 5.5: Student Math A-P/IB Course-Taking by SES Quartile and School Type (in Carnegie Units)

	LOWEST	SECOND	THIRD	HIGHEST	TOTAL
REGULAR PUBLIC					
Mean	.07	.07	.12	.33	.15
SD	.30	.30	.40	.62	.44
Min	0	0	0	0	0
Max	3	3	3	4.5	4.5
N	750	760	771	817	3098
MAGNET					
Mean	.10	.09	.22	.41	.21
SD	.34	.37	.50	.66	.51
Min	0	0	0	0	0
Max	2.5	3	2	3	3
N	165	158	175	199	697
OTHER PUBLIC CHOICE					
Mean	.04	.06	.15	.26	.13
SD	.23	.30	.41	.53	.39
Min	0	0	0	0	0
Max	3	3	3	3	3
N	502	507	523	473	2005
CATHOLIC					
Mean	.04	.05	.10	.22	.15
SD	.18	.24	.32	.48	.40
Min	0	0	0	0	0
Max	1	2	2	3	3
N	68	217	341	662	1288
PRIVATE					
Mean	0	.06	.11	.26	.19
SD	0	.23	.33	.51	.44
Min	0	0	0	0	0
Max	0	1	2	2	2
N	30	79	168	410	687
TOTAL					
Mean	.06	.07	.13	.29	.15
SD	.28	.30	.40	.56	.43
Min	0	0	0	0	0
Max	3	3	3	4.5	4.5
N	1515	1721	1978	2561	775

Appendix 5.6: HLM Results for Student Math AP/IB Course-Taking (in Carnegie Units) as a function of Public and Private School Choice and Other School Characteristics [a] [b]

Fixed Effect	Math AP Course-Taking	
	Coefficient	SE
Base		
INTERCEPT	0.11***	0.02
% MINORITY	0.001***	0.0003
SCHOOL SES	0.29***	0.03
PUBLIC CHOICE	-0.01	0.02
PRIVATE CHOICE	-0.13***	0.03
SCHOOL ORGANIZATION	0.008	0.009
10TH Grade Math Score		
Intercept	0.009***	0.001
% MINORITY	0.0001***	0.00002
SCHOOL SES	0.02***	0.002
PUBLIC CHOICE	-0.002	0.001
PRIVATE CHOICE	-0.006***	0.001
SCHOOL ORGANIZATION	0.0005	0.0006
SES		
Intercept	0.02	0.02
% MINORITY	-0.00001	0.0003
SCHOOL SES	-0.005	0.03
PUBLIC CHOICE	0.01	0.02
PRIVATE CHOICE	-0.04	0.03
SCHOOL ORGANIZATION	0.008	0.01
Black (vs. White)		
Intercept	0.05	0.03
% MINORITY	0.0008	0.0007
SCHOOL SES	0.11*	0.05
PUBLIC CHOICE	-0.02	0.03
PRIVATE CHOICE	-0.09+	0.05
SCHOOL ORGANIZATION	0.02	0.02
Latino (vs. White)		
Intercept	0.07*	0.03
% MINORITY	-0.0004	0.0006
SCHOOL SES	0.04	0.04

[a] Results for 1 imputed data set.
[b] Classes coded as AP/IB math courses in the ELS Transcript File include the following: AP Calculus, IB Math Methods 1, IB Math Studies 1, IB Math Studies 2, IB Math Studies/Calculus, AP Calculus CD, AP Statistics.

Appendix 5.6 (continued): HLM Results for Student Math AP/IB Course-Taking as a function of Public and Private School Choice and Other School Characteristics

	Math AP Course-Taking	
	Coefficient	SE
PUBLIC CHOICE	-0.04	0.03
PRIVATE CHOICE	-0.11**	0.04
SCHOOL ORGANIZATION	-0.006	0.01
Asian (vs. White)		
Intercept	0.29***	0.06
% MINORITY	-0.002+	0.001
SCHOOL SES	0.20**	0.07
PUBLIC CHOICE	-0.06	0.05
PRIVATE CHOICE	-0.05	0.08
SCHOOL ORGANIZATION	-0.02	0.03
Gender		
Intercept	0.01	0.008
Public Choice Propensity		
Intercept	0.36*	0.16
Private Choice Propensity		
Intercept	0.33***	0.07
Level-1 N	7775	
Level-2 N	624	

Appendix 5.7: HLM Results for Student 12[th] grade Math Achievement and Total AP Course-Taking as a function of Public and Private School Choice without Propensity Scores [a]

Fixed Effect	12[th] Grade Math Achievement		Total AP Course-Taking	
	Coefficient	SE	Coefficient	SE
Base				
Intercept	50.77***	0.40	0.60***	0.06
% MINORITY	-0.05***	0.01	0.01***	0.002
SCHOOL SES	12.58***	0.66	1.46***	0.13
PUBCHOIC	0.16	0.49	-0.02	0.07
PRIVCHOI	-0.02	0.67	-0.50***	0.10
SCHOOL ORGANIZATION	0.26	0.24	0.003	0.04
10[th] Grade Math Score				
Intercept	0.98***	0.01	0.04***	0.003
% MINORITY	-0.0004*	0.0002	0.0006***	0.00007
SCHOOL SES	-0.07***	0.02	0.05***	0.006
PUBLIC CHOICE	-0.02	0.01	-0.007+	0.004
PRIVATE CHOICE	-0.03*	0.02	-0.02***	0.006
SCHOOL ORGANIZATION	-0.01*	0.006	0.0009	0.002
SES				
Intercept	0.51*	0.24	0.25***	0.05
% MINORITY	-0.003	0.004	0.0009	0.001
SCHOOL SES	0.12	0.36	0.33***	0.12
PUBLIC CHOICE	1.01***	0.27	0.08	0.07
PRIVATE CHOICE	0.69*	0.35	-0.23*	0.10
SCHOOL ORGANIZATION	0.08	0.12	0.03	0.04
Black (vs. White)				
Intercept	-0.97	0.64	0.14	0.13
% MINORITY	0.005	0.01	-0.002	0.003
SCHOOL SES	-0.10	0.77	0.21	0.20
PUBLIC CHOICE	0.68	0.61	0.01	0.14
PRIVATE CHOICE	0.47	0.77	-0.09	0.20
SCHOOL ORGANIZATION	0.20	0.29	-0.01	0.078
Latino (vs. White)				
Intercept	-0.85	0.61	0.33*	0.14
% MINORITY	0.01	0.01	-0.005*	0.002
SCHOOL SES	-0.34	0.94	-0.26	0.19
PUBLIC CHOICE	0.52	0.63	-0.23+	0.14

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[a] Results for 1 imputed data set.

Appendix 5.7 (continued): HLM Results for Student 12[th] grade Math Achievement and Total AP Course-Taking as a function of Public and Private School Choice without Propensity Scores

	12[th] Grade Math Achievement		Total AP Course-Taking	
	Coefficient	SE	Coefficient	SE
PRIVATE CHOICE	0.06	0.87	-0.06	0.21
SCHOOL ORGANIZATION	0.12	0.27	-0.06	0.06
Asian (vs. White)				
Intercept	1.41*	0.66	1.01***	0.19
% MINORITY	-0.004	0.01	-0.004	0.004
SCHOOL SES	-0.10	0.82	0.53*	0.26
PUBLIC CHOICE	0.94	0.70	-0.27	0.23
PRIVATE CHOICE	-0.88	1.00	-0.51+	0.29
SCHOOL ORGANIZATION	0.48	0.31	0.11	0.13
Gender				
Intercept	-.54***	0.14	0.26***	0.03
Level-1 N	8251		7775	
Level-2 N	633		624	

Appendix 5.8: HLM Results for Student 12[th] grade Math Achievement as a function of Public and Private School Choice Controlling for School-Level Variation in SES [a]

Fixed Effect	12[th] Grade Math Achievement	
	Coefficient	SE
Base		
Intercept	51.16***	0.44
% MINORITY	-0.06**	0.01
SCHOOL SES	12.11***	0.77
PUBLIC CHOICE	-0.19	0.53
PRIVATE CHOICE	0.19	0.78
SCHOOL ORGANIZATION	0.19	0.27
SES		
Intercept	-0.0004	0.82
% MINORITY	-0.006	0.005
SCHOOL SES	0.29	0.48
PUBLIC CHOICE	1.14***	0.30
PRIVATE CHOICE	0.39	0.45
SCHOOL ORGANIZATION	-0.09	0.15
SCHOOL SES VARIATION	**0.75**	**1.21**
10[th] Grade Math Score		
Intercept	0.98***	0.01
% MINORITY	-0.0006*	0.0003
SCHOOL SES	-0.09***	0.02
PUBLIC CHOICE	-0.01	0.01
PRIVATE CHOICE	-0.05*	0.02
SCHOOL ORGANIZATION	0.002	0.007
Black		
Intercept	-0.64	0.74
% MINORITY	-0.009	0.01
SCHOOL SES	-0.86	1.00
PUBLIC CHOICE	1.05	0.68
PRIVATE CHOICE	0.88	0.84
SCHOOL ORGANIZATION	0.28	0.36
Latino		
Intercept	-0.37	0.78
% MINORITY	0.006	0.01
SCHOOL SES	-0.67	1.05

[a] Results for 1 imputed data set.

Appendix 5.8 (continued): HLM Results 12[th] grade Math Achievement as a function of Public and Private School Choice Controlling for School-Level Variation in SES

| | 12[th] Grade Math Achievement | |
	Coefficient	SE
PUBLIC CHOICE	0.34	0.74
PRIVATE CHOICE	0.06	1.00
SCHOOL ORGANIZATION	0.27	0.35
Asian		
Intercept	0.74	0.91
% MINORITY	0.003	0.02
SCHOOL SES	0.05	1.06
PUBLIC CHOICE	0.83	0.88
PRIVATE CHOICE	-0.26	1.13
SCHOOL ORGANIZATION	0.87*	0.39
Gender		
Intercept	-0.35+	0.19
Public Choice Propensity		
Intercept	0.86	3.16
Private Choice Propensity		
Intercept	1.49	1.23
Level-1 N	8251	
Level-2 N	633	

Figure 6.1: Hypothesized Linkages between Choice, Student-Level Track and Achievement

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┌─────────────────┐                              ┌──────────────────────┐
│     Choice      │─────────┐          ┌────────▶│ 10ᵗʰ grade Achievement│
└─────────────────┘         │          │         └──────────────────────┘
        │                    ╲        ╱                      │
        │                     ╲      ╱                       │
        │                      ╲    ╱                        │
        │                       ╲  ╱                         │
        ▼                        ╳                           ▼
┌─────────────────┐         ╱      ╲        ┌──────────────────────┐
│      Track      │────────▶         ╲────▶│ 12th grade Achievement│
└─────────────────┘                         └──────────────────────┘
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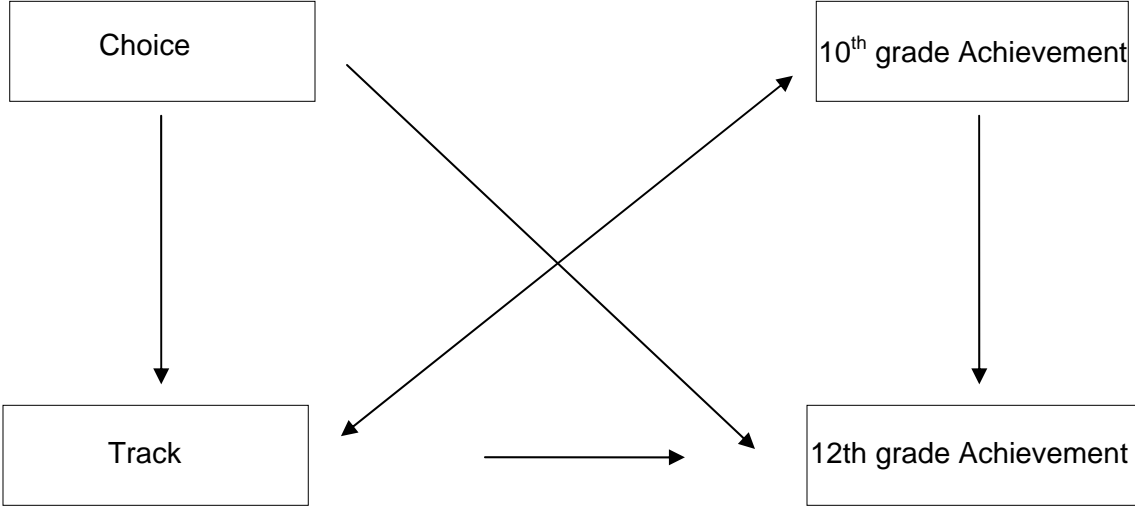Figure 6.1: Hypothesized Linkages between Choice, Student-Level Track and Achievement

Figure 6.2: Hypothesized Linkages between Choice, School Racial and SES Diversity, and Student-Level Achievement
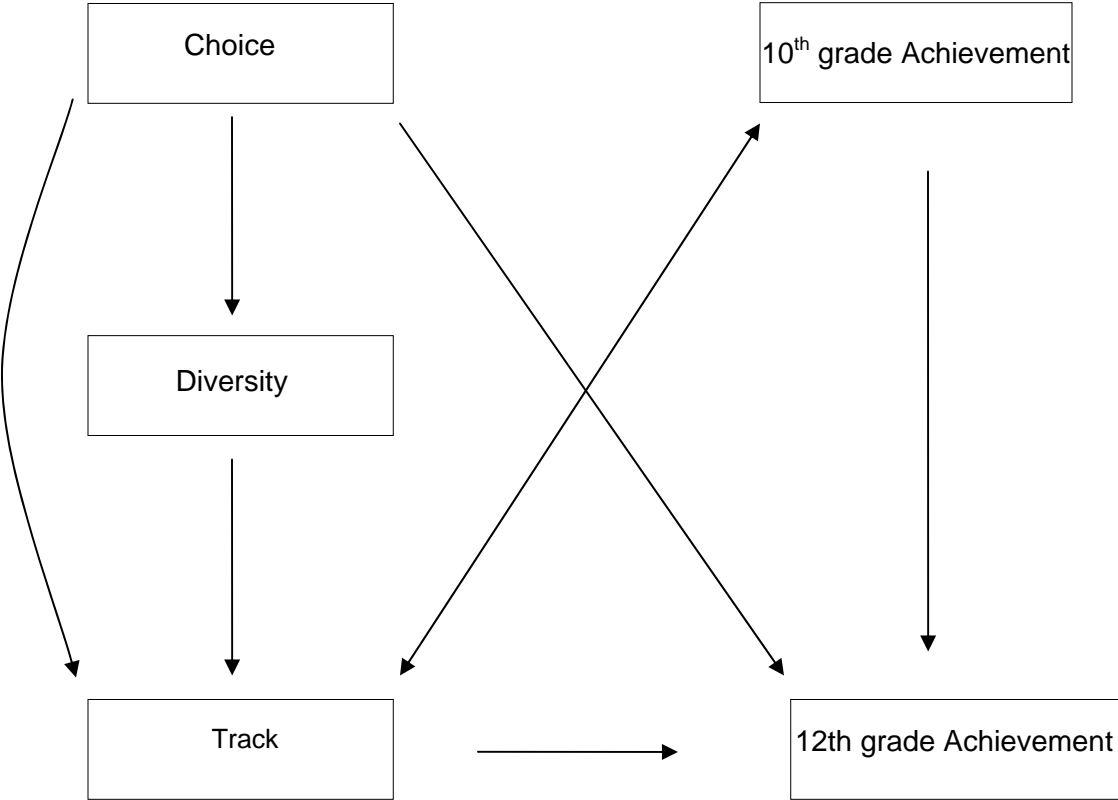
Table 6.1: Descriptive Statistics for School Racial and SES Diversity by School Type

	Regular Public	Magnet	Other Public Choice	All Public Choice	Total
SES Diversity					
Mean	.62	.64	.61	.62	.62
SD	.10	.13	.11	.12	.11
Minimum	.30	.31	.35	.31	.30
Maximum	.92	.92	.93	.93	.93
N	3908	880	2500	3390	7298
Racial Diversity					
Mean	.38	.57	.41	.45	.41
SD	.28	.26	.28	.29	.28
Minimum	.006	.01	.01	.01	.006
Maximum	.99	1.00	.96	1.00	1.00
N[a]	3621	786	2310	3096	6717

[a] There are 204 cases with missing data on the racial diversity variable. Mplus (the data I use for path analysis) imputed values for these cases in the remaining analyses.

Table 6.2: Unstandardized and Standardized Parameter Estimates of the Influence of School Choice and on Student-Level Track Placement and Achievement (Standardized Estimates in Bold; Standard Errors in Parentheses)

	All Groups (N=7273)
Direct Effects	
Public Choice → 12th Grade Achievement	-.53*
	-.02
	(.33)
Public Choice → Track	-.15**
	-.07
	(.03)
Track → 12th Grade Achievement	1.91**
	.13
	(.13)
10th Grade Achievement → 12th Grade Achievement	.93**
	.86
	(.009)
Covariances	
Track with 10th Grade Achievement	5.13**
	.38
	(.20)
Model Fit Statistics	
Chi Square/DF	10.674/2
RMSEA	.023
CFI	.997
TLI	.993
WRMR	.801

** Coefficient 2 times its standard error; *Coefficient 1.5 times its standard error

Table 6.3: Unstandardized and Standardized Parameter Estimates of the Influence of School Choice and SES Diversity on Student-Level Track Placement and Achievement (Standardized Estimates in Bold; Standard Errors in Parentheses)

	All SES Groups (N=7298)	Lowest SES Quartile (N=1778)	Second SES Quartile (N=1816)	Third SES Quartile (N=1767)	Highest SES Quartile (N=1584)
Direct Effects					
Public Choice → 12th Grade Achievement	.12 **.004** (.15)	-.49* **-.02** (.29)	.50 **.02** (.29)	-.01 **.00** (.29)	.37 **.01** (.31)
Public Choice → SES Diversity	.17 **.02** (.15)	-.005 **-.02** (.006)	-.003 **-.01** (.005)	.006 **.03** (.005)	.02** **.07** (.006)
Public Choice → Track	-.13** **-.07** (.04)	.002 **.001** (.008)	-.19** **-.09** (.08)	-.13* **-.06** (.07)	-.15** **-.07** (.07)
SES Diversity → Track	.17 **.02** (.15)	-.80** **-.09** (.33)	.06 **.006** (.37)	-.15 **-.01** (.32)	.63** **.07** (.31)
Track → 12th Grade Achievement	1.81** **.12** (.10)	1.53** **.12** (.24)	1.26** **.09** (.21)	1.69** **.12** (.21)	1.85** **.14** (.20)
10th Grade Achievement → 12th Grade Achievement	.99** **.91** (.006)	.96** **.89** (.01)	.98** **.90** (.01)	.96** **.91** (.01)	.95** **.89** (.01)
Covariances					
Track with 10th Grade Achievement	.12 **.19** (.01)	-.009 **-.03** (.01)	.007 **.04** (.006)	.008 **.05** (.005)	.04** **.14** (.01)
Model Fit Statistics					
Chi Square/DF	2329.557/7	239.596/7	155.308/7	192.993/7	312.785/7
RMSEA	.213	.137	.103	.123	.166
CFI	.923	.957	.977	.972	.939
TLI	.846	.920	.953	.944	.887
WRMR	10.309	3.325	2.682	2.978	3.771

** Coefficient 2 times its standard error; *Coefficient 1.5 times its standard error

Table 6.4: Unstandardized and Standardized Parameter Estimates of the Influence of School Choice and Racial Diversity on Student-Level Track Placement and Achievement (Standardized Estimates in Bold; Standard Errors in Parentheses)

	All Groups (N=6921)	Whites (N=4540)	Blacks (N=1135)	Latinos (N=1246)
Direct Effects				
Public Choice →12th grade Achievement	-.32	.04	.80	.38
	-.01	**.002**	**.03**	**.01**
	(.33)	(.40)	(.70)	(.74)
Public Choice → Racial Diversity	.07**	.05**	.06**	.06**
	.12	**.10**	**.11**	**.12**
	(.007)	(.008)	(.02)	(.01)
Public Choice → Track	-.12**	-.21**	.06	.19**
	-.06	**-.10**	**.03**	**.09**
	(.04)	(.04)	(.10)	(.09)
Racial Diversity → Track	-.23**	.33**	-.29*	-.37**
	-.06	**.09**	**-.08**	**-.10**
	(.07)	(.09**)	(.20)	(.18)
Track → 12th grade Achievement	2.61**	2.43	1.08**	1.59**
	.18	**.17**	**.09**	**.12**
	(.15)	(.22)	(.31)	(.38)
10th Grade Achievement → 12th grade Achievement	.88**	.89**	.97**	.94**
	.82	**.82**	**.87**	**.86**
	(.01)	(.01)	(.02)	(.03)
Covariances				
Track with 10th Grade Achievement	5.07**	5.27**	4.12**	5.17**
	.37	**.40**	**.37**	**.40**
	(.20)	(.25)	(.42)	(.47)
Model Fit Statistics				
Chi Square/DF	120.654/3	54.544/4	4. 520/4	10.374/4
RMSEA	.075	.053	.011	.036
CFI	.962	.978	.999	.987
TLI	.910	.955	.998	.974
WRMR	2.846	1.657	.482	.725

** Coefficient 2 times its standard error; *Coefficient 1.5 times its standard error

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