RACE-ETHNICITY AND SOCIOECONOMIC STATUS IN CONTEMPORARY EDUCATIONAL POLICY

By

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Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

In

Leadership and Policy Studies

August, 2009

Nashville, Tennessee

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ACKNOWLEDGEMENTS

This work would not have been possible without the financial support of the Institute of Education Sciences grant to Vanderbilt's Experimental Education Research Training fellowship for pre-doctoral training (R305B040110) and the National Center on School Choice (R305G040104). I am especially grateful for the guidance and patience of my dissertation committee; Mark Berends, Ellen Goldring, Tom Smith and Douglas Fuchs.

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CHAPTER I

INTRODUCTION

Over fifty years after the landmark decision in *Brown vs. Board of Education* ruled that separate and segregated schools are inherently unequal, and nearly 40 years after steps were taken to dismantle the segregated school systems under the *Civil Rights Act of 1964*, the United States educational system is still grappling with the multifaceted role that race-ethnicity and economic poverty play in the provision of education to the nation's students and in the outcomes that those students derive from the education provided to them (Magnuson and Waldfogel 2008). The last decade has seen increased judicial action ending court ordered desegregation plans in many urban districts, ending bussing and other policies used by the districts to balance the racial-ethnic composition of their constituent schools. Further, in a 2007 ruling the Supreme Court of the United States brought into question the constitutionality of voluntary desegregation plans implemented by some urban districts (e.g. Louisville, KY and Seattle, WA) that based school assignment policies on a student's race (Parents Involved in Community Schools v. Seattle School District No. 1 et al 2007). The end of most district desegregation plans and a movement to neighborhood based school assignment, combined with the fact that America remains largely segregated by race-ethnicity in housing and settlement patterns leads many to believe and worry that re-segregation of American schools will continue unabated and remove the gains of integration from the last 50 years (Orfield and Lee 2007).

Inequalities in academic achievement, as measured by the gap between the achievement of minority group children and their white peers, saw significant reduction in the years from the early 1970s until the mid 1990s, have noticeably leveled off and have remained nearly constant over the last decade (e.g. Neal 2006; Magnuson, Rosenbaum, and Waldfogel 2008). These trends are even more troubling when we take into account the high level of congruence between high levels of racial-ethnic isolation and the prevalence of concentrated poverty. Research has long shown the pernicious and deleterious effect of poverty on a child's educational outcomes (e.g.Rothstein 2004). Poor children have poorer health and nutrition, attend schools that are staffed by less qualified and experienced teachers, are more likely to move more often than their affluent peers, have fewer opportunities for educational experiences outside of school, and are less likely to graduate from high school or continue on to post-secondary education. All of these factors contribute to persistent educational inequalities between minority and majority students, between advantaged and disadvantaged students.

These realities in conjunction with increased focus on the federal and state level on policies to increase student academic achievement and thereby reduce racial-ethnic and socioeconomic achievement gaps point to the need for educational research to continue to focus on the effects of racial-ethnic and socioeconomic inequalities on both the provision of education and the outcomes that students derive from that education.

In a special issue of *Sociology of Education* Gamoran (2001) forecast that educational inequality in the twenty-first century would be marked less by racial-ethnic inequalities than by socioeconomic ones than had been the case in the preceding century given current knowledge on the sources of racial-ethnic inequality and past trends. As part of his rationale

and support for his prediction Gamoran noted that in the United States there is more pressure to reduce racial-ethnic inequality than there is to reduce socioeconomic ones, racial-ethnic inequalities had declined during the twentieth century (whereas socioeconomic ones had not), and social programs such as desegregation and affirmative action appeared to have brought about better educational outcomes for minorities. However Gamoran's predictions are tempered by the fact that racial-ethnic inequalities and socioeconomic ones are linked because minority populations are also on average more socioeconomically disadvantaged. Despite the increased attention that socioeconomic inequalities has received in the era of No Child Left Behind and its mandated reporting of student achievement by free and reduced priced lunch status Gamoran (2008) maintained his supposition that educational stratification by social class would continue unabated throughout the twenty-first century.

This dissertation uses a sociological lens to investigate the roles that race-ethnicity and socioeconomic status — at the individual, school and neighborhood levels—play in three distinct contemporary educational policy issues. These papers represent an illustration of my current and future research agenda: quantitative analyses of the social contexts surrounding schools and schooling and the role that these contexts play in the enactment of educational policy, with special emphasis on racial-ethnic and socioeconomic inequalities.

Chapter II examines the effect of the race and socioeconomic status of individuals, schools and neighborhoods on inequalities in summer academic achievement and in turn how these seasonal inequalities exacerbate achievement gaps between African American and White students in reading and mathematics. Prior research has shown that lower socioeconomic status and minority students experience greater losses in academic achievement than their more affluent and majority status peers during the period of summer

vacation (Heyns, 1978, 1987; Entwisle & Alexander, 1992, 1994). Cooper et al. (1996) in a meta-analysis of 13 studies on summer time learning published since 1975 concluded that "socioeconomic inequalities are heightened by summer break." These differentials in summer learning are important when analyzing the effects of schools on students from different socioeconomic and racial backgrounds.

Building on previous seasonal research (e.g. Benson & Borman, 2007; Downey, von Hippel, & Broh, 2004; Entwisle & Alexander, 1992; Heyns, 1978), this paper seeks to further our understanding the effect of summer time periods of vacation from formal schooling on the academic achievement growth and trajectories of students in the subjects of mathematics and reading by examining variation in student neighborhood and school contexts. This analysis uses achievement and demographic data on students in a large urban district in the southeastern United States covering three school years and two intervening summers (from the fall of 2004 through the spring of 2007).

Chapter III asks what role race-ethnicity and academic ability (as measured by achievement tests) play in parent and student choices to enroll in charter public schools located in Indianapolis, Indiana. This question is important because many opponents of public school choice policies worry that they will exacerbate racial-ethnic isolation and segregation if parents choose to self-select into choice schools that are majority same race-ethnicity as themselves.

Prior research has found that parents who have exercised school choice options almost universally indicate that school quality was of utmost importance in their choice of school. Some have noted that there may be a strong socially desirable component to these survey responses and have suggested the importance of contrasting these findings with

evidence from actual choice behavior (Bifulco and Ladd 2006; Booker, Zimmer, and Buddin 2005; Weiher and Tedin 2002).

This paper asks, "Why do parents choose charter schools?" and further investigates these choices by race-ethnicity, socioeconomic status and academic achievement using two unique data sources collected by the National Center on School Choice and the Northwest Evaluation Association on Indianapolis mayoral charter schools. Information on parents' stated reasons for switching to their current charter school comes from a survey of parents administered to all charter school parents in mayoral charter schools in the spring of 2007. Data on actual choice behavior comes from a longitudinal database of individual students that tracks current charter school students back to their previously enrolled school. The paper concludes with a discussion on the potential for charter schools to exacerbate segregation by race-ethnicity in American schools as well as the implications the findings have for current and future charter school policies.

Chapter IV investigates educational reproduction of socioeconomic status by examining variation in mathematics teachers' instructional practices and content by the socioeconomic status of the schools in which they are located. Since education at its heart is the instruction given by teachers to students in the classroom, it is important to consider the role that socioeconomic status plays in the provision of that instruction.

Building on the seminal qualitative work of Anyon (1981), this study seeks to offer further insight into the link between schools and schooling and the reproduction of socioeconomic status by examining a unique dataset of teacher's instructional practices in elementary mathematics classrooms. During the spring semester of the 2006-2007 school year Surveys of the Enacted Curriculum (SEC) were administered to 786 K-12 mathematics

teachers in the state of Indiana across seven school districts. The SEC allows me to look at the research questions posed in this paper in that it collects a wealth of information on teachers' instructional practices in mathematics from a number of different socioeconomic contexts.

I begin with a discussion on the theoretical perspectives of social reproduction theorists that underpin the view of schools and schooling as social institutions that legitimize the reproduction of social class and status. Next, I present an overview of prior research that informs the theoretical framework for this study. Then, a discussion the data for this study and method of analysis will be presented. Finally, I present results and discuss their implications.

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CHAPTER II

NEIGHBORHOOD AND SCHOOL EFFECTS ON SEASONAL INEQUALITIES IN STUDENT ACADEMIC ACHIEVEMENT

This paper examines the role of seasonal differentials in student learning as a possible contributing factor to persistent academic achievement gaps between African American and white students in mathematics and reading. Differential achievement in academic subjects between African American and white students has been a perennial concern in American education. Although the African American-white test score gap, as measured by the National Assessment of Educational Progress (NAEP), narrowed in both mathematics and reading from 1971 to 1996 by about one-fifth of a standard deviation, more recent evidence suggests that the narrowing of the gap has stalled (Magnuson and Waldfogel 2008; Neal 2006) . With the passage of the No Child Left Behind Act of 2001 (NCLB) with its explicit emphasis on closing racial gaps in student achievement tied to stiff sanctions to those districts and schools that fail to do so, our need to further understand the determinants of the achievement gap is never the more pressing.

The Coleman Report (Coleman et al. 1966) was the first national report that brought to public attention that African American students appeared to have systematically lower academic achievement than their white peers at all grade levels. Since 1966 researchers have looked to a number of explanations that could account for these differentials in academic achievement by race. These explanations have ranged from the discredited but sadly recurring idea of racial genetic differences (Herrnstein and Murray 1994), differences by social class in parental child rearing practices and habits (Chin and Phillips 2004; Lareau

2002), differences in school quality and resources (Fryer and Levitt 2004, 2005), differences in cultural expectations and norms (Fordham and Ogbu 1986), as well as racial bias in standardized testing (Jencks and Phillips 1998). Although racial achievement gaps are problematic in and of themselves, it is more distressing that these gaps appear to widen as students age and progress through school (Downey, von Hippel, and Broh 2004; Fryer and Levitt 2005).

Although many reasons for the achievement gap have been suggested, a substantial literature exists that suggests that a partial explanation of the achievement gap can be found in differences in summer learning opportunities. Specifically, research shows that lower socioeconomic status and minority students experience greater losses in academic achievement than their more affluent and majority status peers during the period of summer vacation (Heyns, 1978, 1987; Entwisle & Alexander, 1992, 1994). Cooper et al. (1996) in a meta-analysis of thirteen studies on summer time learning published since 1975 concluded that "socioeconomic inequalities are heightened by summer break." These differentials in summer learning are important when analyzing the effects of schools on students from different socioeconomic and racial backgrounds. Moreover, Alexander et al. (2001) found that after controlling for a student's summer time learning gains, socioeconomic status is not a significant predictor of achievement gains during the school year. In contrast, Heyns (1978) found that in a sample of Atlanta middle school students statistically significant disparities in academic achievement between students of different socio-economic backgrounds remained during the school year.

Building on previous seasonal research (e.g. Benson & Borman, 2007; Downey, von Hippel, & Broh, 2004; Entwisle & Alexander, 1992; Heyns, 1978), this paper seeks to further

our understanding of the effect of summer time periods of vacation from formal schooling on the academic achievement growth and trajectories of students in the subjects of mathematics and reading by examining variation in student neighborhood and school contexts. Specifically, this paper addresses the following research questions:

- On average, are there seasonal differences in mathematics and reading achievement growth among elementary school children?
- How do seasonal growth rates vary across different types of students?
- How do differences in school contextual factors explain inequalities in students' school year and summer learning growth in mathematics and reading?
- How do neighborhood contexts affect children's mathematics and reading achievement across seasons?
- What effect do the between school and neighborhood contextual differences have on the African American-white and socioeconomic gaps in mathematics and reading achievement growth?

Research on Inequalities in Seasonal Learning

As has been noted, an enduring question in educational research has been one of why poor and minority children achieve less academically, both in terms of levels and in rates of growth, than their more affluent and majority peers. Investigating this problem, Entwisle, Alexander & Olsen (2001) note that researchers have focused on two distinct environments that surround children and in which they inhabit: the school environment and the non-school environment. The school environment is made up of the interactions of children with peers,

teachers and administrators within the organizational framework of the school which functions to provide educational experiences for the child. The non-school environment is the totality of interactions and structures that exist outside of the school. The non-school environment includes interactions between parents and extended family and child as well as family composition and resource availability, located within the family as well as those of the neighborhood within which the family is embedded in terms of residence and work. Although we often think of the school as the place of learning for children, the learning process can be found within the non-school environment of students as well. For example, students learn from their parents through being read to and through activities such as trips to the library and other enrichments (e.g. Chin & Phillips, 2004; Hart & Risley, 1995; Lareau, 2002). Learning can also take place within the neighborhood, through a child's interactions with their peers in parks, playgrounds and on the streets.

Research on the learning of children during summer vacations away from school has been steadily conducted since the earliest years of the 20th century (Cooper et al. 1996). Barbara Heyns (1978, 1987) is generally credited for being the first to conceptualize the seasonality of learning and how inequalities in summer learning have implications for the inequalities observed between socioeconomic and racial/ethnic groups when school is in session (Alexander, Entwisle, and Olson 2001). In her study of Atlanta middle school students (grades 6 – 8) in the mid-1980s Heyns (1978) found there to be substantial differences in learning rates between advantaged (i.e., high socioeconomic status [SES] and white) and disadvantaged (i.e., low SES and African American) students during both the school year and the summer season. Regardless of season, Heyns found that advantaged children learned at higher rates than their disadvantaged peers. Although "[t]he gap between

low- and high-income children, widens disproportionately during the months when schools are not in session" (p. 187), disadvantaged children did appear to make up ground during the school year as their relative achievement progressed at higher rates. Thus, "schooling apparently attenuates the influence of socioeconomic status on achievement and thereby reduces the direct dependence of outcomes on family background" (p. 187).

Building on the seminal work of Heyns, Doris Entwisle, Karl Alexander and colleagues investigated seasonal inequalities in learning among Baltimore elementary school children during the late 1980s and early 1990s with the Beginning School Study (BSS). The BSS was designed to be a longitudinal study that followed a cohort of Baltimore public school students from the first grade in the fall of 1982 through high school until the students were about the age of 22 in 1998 (Alexander, Entwisle, and Olsen 2007). These studies found that socioeconomic status and not race was the main driver of academic inequalities in mathematics and reading among Baltimore first and second graders (Alexander et al. 2007; Alexander et al. 2001; Entwisle and Alexander 1992, 1994; Entwisle, Alexander, and Olsen 2001). Further, they concluded from their analyses that schools were not a major source of academic inequality based on socioeconomic status as poorer children saw consistent losses in academic achievement only during the summer season when school was not in session. These losses are related to the widening of observable achievement gaps as more affluent students consistently made gains during the summer, regardless of race. Finally, patterns appeared that indicated across all socioeconomic strata African American children had higher achievement in mathematics when they were enrolled in integrated school settings.

These findings led Alexander, Entwisle and colleagues to postulate a "faucet theory" to describe the pattern of seasonal learning between advantaged and disadvantaged students

that had been observed. The idea embedded in the theory is that during the school year all students, both advantaged and disadvantaged, have access to the same resources embodied in the school and the process of learning. In effect, the resource 'faucet' is open equally to all students, and all students benefit equally from access to these resources. In the summer, when students are no longer in school, the resource 'faucet' of school is effectively turned off. During this time, the only resources available to children for learning growth are those that are embedded in their families and neighborhoods. Thus, differential summer learning occurs when more advantaged children continue to have access to educational resources and learning experiences due to their socioeconomic status and environments in the family and neighborhoods, while their less affluent and disadvantaged peers do not have access to the same amount or type of learning resources.

This differential access to educationally meaningful experiences and resources can lead to observed differences in learning during the summer between advantaged and disadvantaged children. In this way, advantaged children may gain in academic achievement during the non-school period, while disadvantaged children may gain no ground academically or may actually lose ground so that they return to school in the fall at a level lower than when they left in the spring for summer vacation. In their own words, "…the increasing gap in test scores between the two groups of children [advantaged versus disadvantaged] over the first five years of elementary school accrued entirely from the fact that relatively affluent children continued to gain when school was closed whereas poor children stopped gaining or even lost ground…However, during the winters, when children were in school, both groups gained virtually the same amount" (Entwisle et al. 2001:2).

Seasonal Learning in Nationally Representative Data

One critique of the findings of the Beginning Schools Study and other seasonal learning research of the late 1970s through the 1990s (e.g.Entwisle and Alexander 1992; Heyns 1978) is that the samples used in these analyses might not be representative of the national population of school aged children as a whole. These analyses drew samples from particularly disadvantaged schools from specific urban locales—the BSS studies in Baltimore and Barbara Heyns' research in Atlanta. Downey et al. (2004) comment: "disadvantaged urban schools are more similar than schools in general, so studies that focus on disadvantaged urban schools may exaggerate schools' equalizing effects. On the other hand, it may be that disadvantaged urban children are exceptionally similar in the *non-school* environments, so that research on such children may underestimate non-school inequality in the larger population" (p. 617).

To investigate seasonal variation in achievement with nationally representative samples researchers have utilized the longitudinal database compiled by the National Center for Education Statistics (NCES) known as the Early Childhood Longitudinal Study-Kindergarten Cohort of 1998-1999 (ECLS-K) (U.S. Department of Education 2002). ECLS-K is a nationally representative sample of students and may be more representative than past research that was limited to disadvantaged urban youth and may not have been representative of the larger population of school aged children.

Findings from ECLS-K studies on seasonal learning inequalities have, for the most part, been consistent with the findings of previous research. For example, ECLS-K researchers (Benson and Borman 2007; Downey et al. 2004; Reardon 2003) note that achievement gaps are already present at the beginning of kindergarten with lower SES and

minority children having substantial lower achievement scores in mathematics and reading than their more affluent peers. Reardon (2003) notes that where racial-ethnic gaps in initial achievement at kindergarten entry were found, "a substantial portion, but not all, of the initial race/ethnic gaps is explained by SES differences between race/ethnic groups" (26).

During the summer time all students in the ECLS-K sample learned at slower rates in reading and mathematics, however the rate of slowing was not equal for all socioeconomic groups, with lower SES students losing ground while higher SES students continued growing (Benson and Borman 2007). No evidence of differential learning rates between African American and white students in both subjects during the summer was found (Benson and Borman 2007; Burkam et al. 2004). In similar findings, Reardon (2003) notes, that "there is no evidence of race-ethnic differences in learning rates, but clear evidence of SES gaps in summer learning (28)," but once school contextual factors were controlled for, the SES gaps disappeared.

School Effects on Seasonal Learning

In comparison to out of school inequalities in learning, ECLS-K analyses indicate that schools may play a role in tempering socioeconomic inequality in achievement. For example, Downey et al. (2004) estimated that socioeconomic gaps in learning in mathematics and reading are still present during the school year, but are much smaller than those found during the summer time. Benson and Borman estimated a substantial SES achievement gap in math noting, "After the beginning of school, kindergarten was clearly the season in which family social background exerted the largest influence on math achievement (27)." By the first grade there was no significant SES achievement gap in mathematics owing in part to an estimate of

higher SES students having slower rates of growth than their middle SES peers. Reardon in similar findings states that low SES students appeared to make up ground relative to their middle class peers in first grade math suggesting that schools attended by these students may have a compensatory effect in mathematics learning. In reading, students from higher SES backgrounds enjoyed a significant learning advantage in both the kindergarten and 1st grade school years. During the kindergarten year these socioeconomic gaps in reading may be "driven largely by the disadvantages experienced by students growing up in low-SES families (Benson and Borman 2007:24)." These SES gaps persisted into the 1st grade but the difference in learning rates was much smaller.

In terms of racial/ethnic gaps Downey et al. (2004) found that unlike SES, schools do not temper the gaps as well and may actually widen the gap between African American and white children in reading skills. Controlling for SES, the African American disadvantage was 0.15 points per month during kindergarten (relative to whites) and 0.29 points per month during 1st grade. During the summer, the difference between African American and white children in reading skill growth was statistically indistinguishable from zero. These findings are also present in other analyses of the same data. These findings indicate that after controlling for SES and initial reading skills, African American and white students learned at the same rate during the summer, but once school was in session, African American children started to fall behind. It was found that school contexts were import in explaining the persistence and widening of African American – white reading achievement gaps. In contrast, in terms of mathematics achievement growth there were no significant African American – white gaps, especially after school composition was taken into account (Benson and Borman 2007; Downey et al. 2004; Reardon 2003).

Neighborhood Effects on Seasonal Learning

The role of disadvantaged neighborhood contexts and the effects of poverty on childhood development have long been a focus of social science research (e.g.Wilson 1987; Leventhal and Brooks-Gunn 2000; Brooks-Gunn et al. 1993; Crane 1991). In a review of neighborhood effects Jencks and Mayer (1990) elucidated several models that have been put forth as mechanisms for neighborhoods' influence on childhood outcomes. First, epidemic models look towards the effect of peer composition on outcomes under the main assumption that the behavior and context of one's neighborhood peers influences an individual's behavior. In Jencks and Mayer's words, these theoretical models assume that, "like begets like (113)" whereby for example in neighborhoods where there is a high degree of high school completion, individual children will feel compelled to also finish high school. Collective socialization models posit that the presence of positive adult role models, outside of the family, within a neighborhood serve to influence positive outcomes and behaviors of the children within the neighborhood. Institutional resource models hypothesize that access to institutional resources (e.g. libraries, health care facilities, churches) affect children and influence outcomes by providing the possibility of more safe and stimulating learning environments that can lead to positive outcomes. As Goldring et al. (2006) note, "The capacity of parents in high-risk neighborhoods to manage and promote educational success and healthy outcomes for their children may be powerfully influenced by the nature of, and the ability to activate, existing assets and community capacity building in the neighborhood (358)."

In the extant literature on summer learning differentials only Benson and Borman (2007) have explicitly looked at the effect of neighborhood contexts on summer learning.

The authors used as their measure of the disadvantage or advantage of a child's neighborhood as the socioeconomic status[1] of the U.S. census tract within which the child's home address was located. The authors found significant effects of a child's neighborhood context on their achievement in mathematics and reading at both entry into school (beginning Kindergarten) and during the summer between Kindergarten and first grade. Children in disadvantaged neighborhoods began school significantly behind their advantaged peers and these effects continued through summer time as well.

This study expands the investigation of seasonal inequalities in children's academic achievement in several ways. First, this study bridges what I have identified as the two major streams of scholarly inquiry in seasonal learning research; studies from single localities and those with national samples. This is accomplished by using analytic strategies that stem from the improvements in methodological sophistication found in the national studies with the richer contextualization that is possible from studies within single defined localities. Second, this study also allows for richer test of the "faucet theory" that Alexander, Entwisle and colleagues put forth to explain their findings in Baltimore by expanding the investigation of the role of neighborhood contexts on seasonal inequalities in student achievement by including data on the institutional assets contained within those neighborhoods.

Data and sample

The analysis that follows uses achievement and demographic data on students in the Metropolitan Public School District (the District; MPSD) in a Southern state (the State)

[1] The authors created their SES measure from census data on the educational attainment and median family income for each census tract

covering three school years and two intervening summers (from the fall of 2004 through the spring of 2007). These data come from the Northwest Evaluation Association's (NWEA) Growth Research Database (GRD) that is currently a focus of research at the National Center on School Choice (NCSC), and they are supplemented by school and neighborhood level data from a number of state and national sources.

The District presents a unique opportunity for research on seasonal inequalities by allowing for the creation of an analytic sample that has several unique qualities: (1) the district and sample is much more diverse in terms of the race-ethnicity and socioeconomic status of its student body compared to the BSS sample; (2) covers a broad range of elementary grades (e.g. grades 2-5 versus K-1); and (3) covers a diverse socioeconomic range of neighborhoods from very affluent to acutely disadvantaged.

The District is one of the largest public school districts in the United States. During the 2005-2006 school year the district enrolled approximately 43,000 K-12 students in 79 elementary and secondary schools (Garofano and Sable 2008). This places the District in the top 1 percent of U.S. school districts in terms of size of enrollment. The district is the second largest public school district in the State. [2]

Students

Data on student level demographics and achievement comes from the Northwest Evaluation Associations (NWEA) Growth Research Database (GRD). The Northwest Evaluation Association is a non-profit student achievement testing company that tests students in grades 2 through 10 in mathematics, reading and language arts. MPSD began

[2] The District represents approximately 6% of the total K-12 student enrollment in the State

contracting with NWEA to provide interim assessments of its students' achievement in reading and mathematics in the fall of 2004.

Since I am interested in estimating the effects of neighborhoods on student achievement growth during the school year and summer seasons, I limited the analysis sample to students enrolled in regular public schools that have defined enrollment zones, which excludes magnet and district run charter schools that can enroll students from across the district. In addition, I removed schools that closed during the time period under investigation and one primary school (grades K-2) that opened during the 2005-06 school year. Finally, because my analytic strategy (discussed below) uses hierarchical linear modeling (HLM) techniques that do not allow for variation within individuals at the highest level of the model (i.e., students who change schools during the period under investigation), I focused only on elementary schools as I cannot model structural moves to middle and high schools. Under these criteria the final analysis frame consists of students in grades 2 – 5 enrolled in the 40 regular public elementary schools located in the district. Similarly to structural movers, students who change schools during the time period are not included in the final sample as I cannot model these changes in schools and neighborhoods with the chosen analysis methodology.

Under these criteria the final student level data set contains testing and demographic information on 7,935 unique individual students across grades 2 – 5 enrolled in the MPSD across three school years and their intervening summer seasons beginning in the fall of 2004 through the spring of 2007. These students are grouped into one of three mutually exclusive cohorts based on the grade of enrollment and the year of testing. Each cohort is comprised of

students who begin the first school year in the same grade and follows the same grouping of students through three school years and two summers.[3]

The final analysis sample is 45.7 percent African American, 46.0 percent white and 8.3 percent other race (Table 1).[4] This distribution over-represents white and other race students compared to the district.[5] Supplementary analyses indicated that this was due to the restriction on student movement between schools which resulted in the loss of more African American students than white students. This highlights an important caveat to remember about this sample. The analysis sample is composed only of students who do not move between schools during the three school years under study and may therefore be a conservative estimate of the effects of the exposure to the school year and summer seasons on student achievement growth if highly mobile students are systematically different from non-mobile students.

The sample also under represents the district enrollment of free and reduced priced lunch subsidy eligible (FRL) students in these schools. Whereas the district enrollment across elementary schools is approximately 67 percent FRL, this sample is only 36 percent. The main reason for this is that FRL students are more highly mobile between schools and are therefore lost from the sample. Therefore, when considering the interpretation of the effect of FRL status on student achievement in this sample of students, it is important to remember

[3] The first cohort is observed in the 2nd grade, the second cohort is observed in the 3rd grade during the first year, and the third cohort is observed in the 4th grade during the first year. Each cohort moves to the next highest grade in successive year so that the cohorts are in the 4th and 5th grades respectively. The third cohort does not include the 6th grade because very few elementary schools contain this grade in the district. Those elementary schools that do enroll 6th grade are inordinately found in the most disadvantaged locations, and comprise a small percentage of the 6th grade students in the district. I have therefore excluded this grade from the analysis as it is likely to be not representative of the 6th grade as a whole.

[4] Hispanic, Asian, and American Indian are combined into Other race due to low individual incidences in this district.

[5] Across the three years under study the 40 sampled schools are 55.0 percent African American, 37.7 percent white and 7.2 percent other race.

that this variable is an indicator of student poverty status. The sample also under represents the district enrollment of free and reduced price lunch subsidy eligible (FRL) students in these schools. Whereas the district enrollment across elementary schools is approximately 67 percent FRL, this sample is only 36 percent. The main reason for this is that FRL students are more highly mobile between schools and are therefore lost from the sample. Therefore, when considering the interpretation of the effect of FRL status on student achievement in this sample of students, it is important to remember that this variable is an indicator of student poverty status for those students who remain in the same school. As such, it is likely to be a conservative estimate of the effects of child poverty on achievement.

Table 1: Descriptive Statistics of Sample

Level 1: Achievement Tests within Students					
Variable	n	Mean	St Dev	Min	Max
Math Score	**28,779**	**205.69**	**17.17**	**141.61**	**264.56**
Math School Year Exposure	**28,779**	**12.21**	**8.21**	**0.23**	**28.19**
Math Summer Exposure	**28,779**	**2.21**	**2.13**	**0.00**	**5.53**
Reading Score	**28,496**	**199.92**	**17.52**	**137.84**	**246.23**
Reading School Year Exposure	**28,496**	**12.22**	**8.13**	**0.23**	**28.29**
Reading Summer Exposure	**28,496**	**2.21**	**2.13**	**0.00**	**5.53**
Level 2: Student Characteristics					
Variable	n	Mean	St Dev	Min	Max
White	**7,935**	**0.460**	**0.50**	**0.00**	**1.00**
Black	**7,935**	**0.457**	**0.50**	**0.00**	**1.00**
Other	**7,935**	**0.083**	**0.28**	**0.00**	**1.00**
Female	**7,935**	**0.48**	**0.50**	**0.00**	**1.00**
Free and Reduced Lunch	**7,935**	**0.36**	**0.48**	**0.00**	**1.00**
Special Education	**7,935**	**0.07**	**0.26**	**0.00**	**1.00**
Cohort 1	**7,935**	**0.35**	**0.48**	**0.00**	**1.00**
Cohort 2	**7,935**	**0.33**	**0.47**	**0.00**	**1.00**
Cohort 3	**7,935**	**0.33**	**0.47**	**0.00**	**1.00**
Level 3: School and Neighborhood Characteristics					
Variable	n	Mean	St Dev	Min	Max
School Disadvantage	**40**	**0.00**	**1.00**	**-2.15**	**0.97**
Pct. free and reduced lunch eligible students	*40*	*0.67*	*0.30*	*0.05*	*0.97*
Pct. minority students	*40*	*0.71*	*0.31*	*0.01*	*1.00*
Per Capita Assests	**40**	**2.28**	**1.63**	**0.00**	**6.97**
Neighborhood SES	**40**	**0.00**	**1.00**	**-2.51**	**1.90**
Pct. Less than HS	*40*	*0.25*	*0.13*	*0.04*	*0.50*
Median Household Income	*40*	*$35,740.86*	*$15,435.56*	*$9,098.20*	*$74,107.60*
Mean Occupational Prestige	*40*	*43.78*	*6.11*	*28.60*	*57.10*
Pct. Poverty	*40*	*0.21*	*0.15*	*0.04*	*0.65*
Pct. Single Parent Households	*40*	*0.42*	*0.22*	*0.14*	*0.95*

Dependent Variables

Within the 7,935 individual students contained in the sample, across the three years, I observe a total of 28,779 mathematics test scores and 28,496 reading test scores (see Table 1). As expected, not all students have complete testing records during this time period due to factors such as movement between schools and absences on days of testing, among other reasons.

As previously noted NWEA provides interim assessments of student achievement in mathematics and reading during the fall and spring for students in grades 2 through 10. These assessments are customized for each state so that they are generally aligned with relevant state standards.[6] Generally, each test is composed of 40 to 50 questions drawn from an item bank of over 2000 items of varying difficulty that are vertically equated on an equal interval scale using item response theory (IRT). These achievement tests are different from other standardized tests in that the tests are computer adaptive assessments, meaning that as students progress through the test, they are presented with items at a difficulty level based on their current performance on the test. Given these properties, achievement scores of students in different grades are directly comparable since they are on the same scale, and student achievement growth can be tracked over time across grades (Cronin et al. 2007; Northwest Evaluation Association 2002, 2003, 2004).

Schools

Data on the context of schools comes from two sources. First, demographic and socioeconomic status of school enrollments comes from the National Center for Education Statistics (NCES) Common Core of Data (CCD). These data are linked to each student based on their school of enrollment. From these data I created two variables that measure the proportion of students in a school who are of a minority (non-white) race-ethnicity and the proportion of students who are eligible for free and reduced priced lunch (FRL).

Although normally one would like to model the effects of poverty and racial composition of school populations separately within the same analysis (in this case as proxied by the proportion of free and reduced priced lunch status enrollment and the

[6] http://www.nwea.org/research/state.asp

proportion of minority enrollment respectively), this strategy is not possible in the context of the schools in this data. The zero order correlation between these two variables is 0.97, meaning that the two school characteristics move almost perfectly together within this sample of schools. Thus, I have combined the two into a single standardized measure of a school's disadvantage with a mean of zero and a standard deviation of 1. For illustrative purposes, the elementary school with the lowest value on this scale (i.e., the least disadvantaged) has a minority student enrollment of only 1.6 percent and 4.0 percent of its enrollment eligible for free and reduced priced lunch. In contrast, the school with the highest level of disadvantage as measured by this scale has an enrollment that is composed of 99.9 percent minority students and 97.2 percent free and reduced priced lunch eligible students. From the descriptive statistics of the variables that make up my measure of school disadvantage (see Table 1) we can see that between elementary schools in the MPSD there is a wide range in the composition of these schools in the percentages of minority and free and reduced priced lunch eligible students enrolled with the standard deviation for each at approximately 30 percent. Taken together, the high level of correlation between the percentage of minority and FRL students and the large variation between schools paint a picture of elementary schools in this district that exhibit high levels of segregation of students along racial-ethnic and poverty lines.

Figures 1 and 2 illustrate this point further by presenting the school level percentages of minority and FRL students in quartiles on a stylized map of the district. Schools are represented on this map by the individual blocks representing the 40 elementary schools in the sample. By comparing Figure 1 to Figure 2, we can see that in this district there are

Figure 1: Stylized district map of school percent minority enrollment quartiles

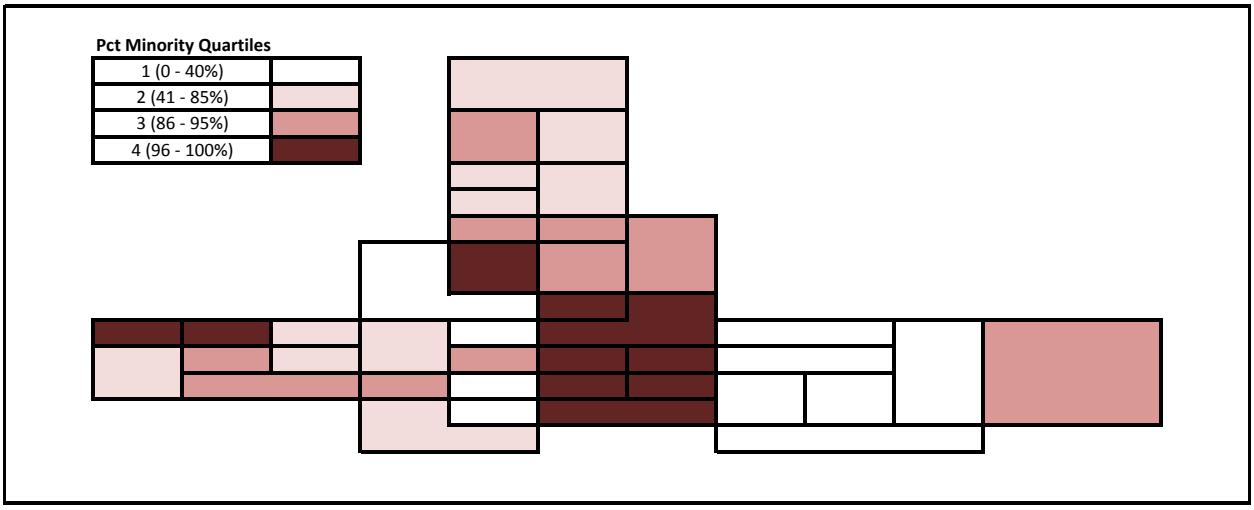
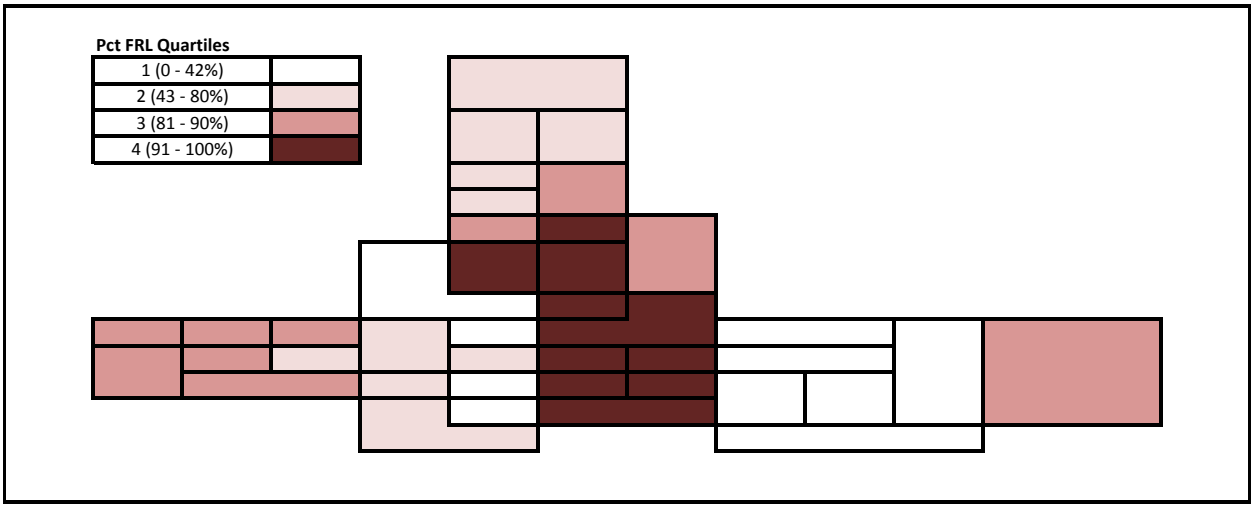


Figure 2: Stylized district map of school percent free and reduced lunch eligible enrollment quartiles



concentrations of schools that are very low minority and FRL (represented in white) as well as concentrations that are predominately minority and FRL status (represented in dark grey).

Neighborhoods

To expand on the operationalization of neighborhood effects in this analysis I am using the school's attendance zone from which a school draws its enrollment of students. While there is no general consensus in the literature on the best way to define neighborhoods geographically and conceptually, I treat this attendance zone as a proxy for the neighborhood, and the concomitant neighborhood context within which a school's students live. This is preferable to using only the census tract within which a school is located as a proxy for the neighborhood as schools' enrollments may come from a number of census tracts and therefore using the actual attendance zones allows for a more robust accounting of the actual neighborhoods within which students reside.

For each school I obtained the attendance zone where its student enrollment comes from (see Appendix A for more information on this process). Using geographic information systems (GIS) software, I linked census data at the block group level (Form 3 of the US Census 2000) to the school attendance zones. In cases where census block groups did not exactly map into school attendance zones a decision rule was followed whereby any census block group of which any portion of its area fell within the school attendance zone was counted as belonging to that school. To generate neighborhood variables from the census block group data I averaged data from all the census block groups covered by an attendance zone and used these averages as the neighborhood variable. Therefore, the measures that I

derive from the census data are proxies for the neighborhood context from which a given school's student enrollment comes.

Neighborhood characteristic variables collected from Census data exhibited many of the same properties that were discovered within schools. Namely, neighborhoods in this metropolitan district are also segregated to a degree along racial-ethnic and socioeconomic lines as the zero order correlations between variables within these two classes of characteristics exhibit a high degree of collinearity. For example, neighborhoods with large concentrations of minority residents also had high concentrations of residents in poverty and residents who had low educational attainment. Although I originally hoped to be able to investigate the independent effects of these neighborhood characteristics on season student achievement growth this was not possible, and instead these measures were combined into a measure of neighborhood socioeconomic status.

Socioeconomic Status: standardized composite of the proportion of residents aged 25 or older whose educational attainment was less than high school, median household income, the average occupational prestige score of a neighborhood's employed civilian population aged 16 and older,[7] the proportion of residents whose income fell below the Census determined poverty level, and the proportion of single parent households. To maintain the interpretation of socioeconomic status as meaning that higher scores equate to higher socioeconomic status the variables for poverty, less than high school attainment and public assistance income were reverse code prior to the creation of the socioeconomic status scale.

[7] Occupational prestige scores were determined by a process of matching the occupational categories and concomitant prestige scores from the 1989 General Social Survey (Nakao and Treas 1994) to the occupational categories used in the Census 2000 (Scopp 2003). The aggregate measure of occupation prestige for each neighborhood was created by multiplying the occupational prestige score for a given category by the proportion of the civilian workforce age 16 or older employed in that occupation and summing across all categories.

The individual items were first individually standardized, then combined and standardized so that the final variable has a mean of zero and a standard deviation of one.

From the descriptive statistics presented in third panel of Table 1 we can see that like schools, neighborhoods in this district are characterized by a wide range of relative disadvantage and affluence. For example, children who live in the lowest socioeconomic status neighborhood (SES= -2.51) inhabit an environment that is categorized by a high level of residents in poverty (64.5 percent), residents who have not completed high school (49.4 percent), low household incomes ($9,098.20) and in which a majority of residents work in low prestige occupations (28.6 which is equivalent to occupations similar to laborers and janitors). Contrasted to this, children living in the highest socioeconomic status neighborhood are surrounded by few residents in poverty (3.8 percent), resident who are highly educated (only 3.6 percent of resident have not completed high school and 61.7 percent of residents have a bachelors degree or higher), high median household incomes ($74,107.60) and residents who work in high prestige occupations (57.1 which is equivalent to occupations that are executive, administrative and managerial in nature).

Per Capita Neighborhood Assets: For use in this analysis I obtained information on the location of licensed daycares, fire stations, public libraries, healthcare facilities, community organizations and churches located within the administrative boundaries of the County from the GIS Data Server at the State University, which collects and stores GIS data from a number of sources within the State. Within each neighborhood, I calculated a total count of assets across all types and divided by the total population in thousands of the neighborhood to account for the natural tendency of such assets to be more numerous in areas with higher populations to serve. To the extent that the availability of institutional

assets within a given neighborhood is related to positive outcomes for residents and children, we would expect to find that neighborhoods with higher concentrations of assets to be related to more positive achievement growth.

Analytic Methods and Modeling

For this analysis I specify a series of three level hierarchical linear growth models that will account for the nesting of student testing events in students, which are in turn nested in school and neighborhood contexts. This methodological approach allows for the comparison of achievement growth rates during the summer season with those during the school year. This design will also allow me to examine the effect of individual student level characteristics of race-ethnicity and socioeconomic disadvantage (as proxied by free and reduced lunch status) on both seasonal growth rates. Finally, the third level comprises school and neighborhood characteristics and allows for the examination of the contextual effects of schools and neighborhoods for different types of students (i.e., African American v. white, etc).

HLM models have the added benefit of partitioning variance in student achievement into both within and between variance of the third level unit of analysis (i.e., schools and neighborhoods). By first estimating unconditional models (models with no explanatory variables that are allowed to vary randomly at each level), I can estimate the amount of variance that lies within schools and neighborhoods (variation between students) and the amount of variance that lies between schools and neighborhoods. Further, by comparing the estimated variance of fully specified models to the unconditional models, I will be able to

estimate the amount of variation that is explained by differences between students and the differences between schools and neighborhoods as captured by the explanatory variables in the models. These estimates will be important in examining the potential reasons for seasonal inequalities in achievement.

Unconditional Model

We can think of the growth of a student's achievement in mathematics and reading as occurring during two distinct time periods, the first during the school year and the second during the summer when school is not in session. Consider then the following model:

(1) $$Y_{tij} = \pi_0 + \pi_{1ij} SY_{tij} + \pi_{2ij} Sum_{tij} + e_{tij}$$

where Y_{tij} is the mathematics or reading achievement at time *t* for student *i* in school/neighborhood j.

SY_{tij} is a time variable that captures a student's exposure to school (time spent in school during a school year) at time *t* in months. These values are adjusted for the actual beginning and ending dates of the school year, which allows the model to extrapolate achievement from the actual date of testing to the beginning and ending of school. For example, if the school year began on August 1st and a student was tested on October 1st then the value of SY_{tij} at this testing point would be 2.03 months of exposure to the school year. Similarly, suppose that in the next year school also begins on August 1st a student is again tested on October 1st, which represents 2.03 months of exposure to the second school year. Since I am modeling the exposure to the school year as one slope, the value of SY_{tij} at this

time point must also reflect the cumulative exposure to schooling that the student had in the first year. Therefore in this example SY_{tij} in the fall of the second year takes the value of 11.66 months (the length of the first school year, 9.63 months, + the student's exposure to the second school year, 2.03 months).

Sum_{tij} is a time variable that takes the value of 0 up to the last day of the first school year and captures the elapsed time in months of the length of the summer period that a student has been exposed to at time *t*. In this sample of students summer lasted 2.5 months during the first summer and 3.03 months during the second summer. During the first school year the value of the summer variable takes the value of zero. During the second school year the value of summer is 2.5 months and during the third school year the value of summer is 5.53 months.

e_{tij} is a random error that is assumed to be normally distributed with a mean of 0 and variance of σ^2 representing measurement error in a student's test score deviating from their true achievement level.

Finally, under this specification the intercept, π_0, is the average initial achievement for student *i* at time *t* = 0, which in the case of these data is the beginning day of the 2004-2005 school year.

In the unconditional model both the second (students) and third (school or neighborhood) levels contain no other explanatory variables and the slopes for the intercept, school year growth rate and the summer growth rate are allowed to vary randomly across students and schools/neighborhoods such that level two of the model becomes:

(2) $\pi_{0-2,ij} = \beta_{0-2,0j} + r_{0-2,ij}$

where the estimates of the initial student achievement level, π_{0ij}, the school year growth rate π_{1ij}, and the summer growth rate, π_{2ij}, are modeled as having an intercept, $\beta_{0-2,0j}$, which is interpreted as the mean value of the given estimate for a student in school *j*, and a random error, $r_{0-2,ij}$, which is individual student *i*'s deviation from school *j*'s mean, which is assumed to be randomly distributed with a mean of zero and variance of τ_π.

Similarly, level three of the model becomes:

(3) $\beta_{0-2,0j} = \gamma_{0-2,00} + u_{0-2,0j}$

where the student mean estimates $\beta_{0-2,0j}$ are decomposed into a mean school effect, $\gamma_{0-2,00}$, and a random school or neighborhood effect, $u_{0-2,0j}$, which is the deviation of school or neighborhood *j* from the grand mean. These random effects are assumed to be normally distributed with a mean of zero and a variance of τ_β.

Preliminary investigations of models that explicitly allowed separate slopes for each school year and summer were conducted. Estimates of these slopes indicated there to be a slightly declining relationship between time and student achievement growth (i.e., students learn less per month as they age, as measured by these tests), however the confidence intervals around these estimates did not preclude the possibility that the estimates for all school years were statistically indistinguishable from one another. The same was found for the separate summer slopes. Therefore, I have chosen to model one inclusive school year exposure slope and one summer exposure slope for the sake of parsimony without a loss of generalizability on the average effects modeled.

Inequalities between Students

In the next set of models I add a set of student demographic and socioeconomic variables to the intercept and each of the seasonal estimates such that the second level equation now becomes:

(4)

$$\pi_{0-2,ij} = \beta_{0-2,0j} + \beta_{0-2,1j} AA_{ij} + \beta_{0-2,2j} O_{ij} + \beta_{0-2,3j} FRL_{ij} + \beta_{0-2,4j} SPED_{ij} + \beta_{0-2,5j} Female_{ij} + \beta_{0-2,5j} C2_{ij} + \beta_{0-2,5j} C3_{ij} + r_{0-2,ij}$$

where the intercept and the seasonal slopes are modeled as varying by individual student characteristics that include; dummy variables representing the student's race-ethnicity (African American , AA_{ij}, or other, O_{ij}, with white as the omitted reference category), a dichotomous indicator of a student's free and reduced priced lunch status, FRL_{ij} (1 = eligible, 0= ineligible), a dichotomous indicator of a student's receiving special education services, $SPED_{ij}$, and a dichotomous gender variable $Female_{ij}$ (female = 1, male = 0). Finally, because the analytic sample includes three cohorts of students, I include dummy variables for the second (C2) and third (C3) cohorts, with the first cohort as the excluded category. These cohort indicator variables capture the differences in achievement not only between separate groups of individual students, but also differences between students of different ages. Therefore these indicators can be interpreted as the difference between students that are one (C2) and two (C2) grades older than the comparison group. With the inclusion of these cohort indicators the interpretation of the intercept becomes the initial achievement level of

the first cohort on the first day of the second grade in the 2004-05 school year. For this model, the third level is identical to equation (3).

The inclusion of these student variables will allow me to investigate if inequalities in initial status, achievement growth during the school year and summer exist between separate groups of students in reading and mathematics.

School and Neighborhood Contexts

In the final set of fully specified models I first add school level contextual variables to equation (3) such that the third level becomes:

(5) $$\beta_{0-2,0j} = \gamma_{0-2,00} + \gamma_{0-2,01} S\_Dis + u_{0-2,0j}$$

Where measures of school *j*'s disadvantage (S_Dis) is entered as a covariate of the intercept and seasonal slope estimates. The disadvantage variable is entered into the model grand mean centered so that the interpretations of the $\gamma_{0-2,00}$ become the expected effect of school year and summer exposure in schools with characteristics at mean values for the entire sample on the intercept and seasonal slope estimates.

When modeling the effect of neighborhood contexts on student achievement the third level becomes:

(6) $$\beta_{0-2,0j} = \gamma_{0-2,00} + \gamma_{0-2,01} Assets_j + \gamma_{0-2,02} SES_j + u_{0-2,0j}$$

which models the mediating effect of per capita assets ($Assets_j$) within neighborhood j as well as the socioeconomic status (SES_j) of the neighborhood. Like their school level counterparts, these neighborhood contextual variables are grand mean centered.

Results

On average are there seasonal differences in mathematics and reading achievement growth among elementary school children in the District? The estimates of the unconditional model for mathematics and reading indicate that children learn at dramatically different rates when they are exposed to school during the school year and when they are not during the summer. In mathematics (Table 2, Model 1), elementary school children in the District on average, unadjusted for individual or contextual factors of schools and neighborhoods, gain 1.47 points per month during the school year and lose 1.66 points per month during the summer. Considering that the average length of the school year in the district is approximately 9.5 months, the average elementary student is estimated to gain 13.97 points

Table 2: School and Neighborhood Effects on Seasonal Learning Growth in Mathematics

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*SE*	*Coefficient*	*SE*	*Coefficient*	*SE*	*Coefficient*	*SE*
Level 1: Test Events (n = 28,779)								
Initial Level (Intercept)	188.52 ***	(0.87)	181.61 ***	(1.14)	181.24 ***	(0.88)	181.44 ***	(0.94)
School Year Growth per Month	1.47 ***	(0.03)	1.79 ***	(0.04)	1.81 ***	(0.04)	1.80 ***	(0.04)
Summer Growth per Month	-1.66 ***	(0.11)	-1.75 ***	(0.13)	-1.85 ***	(0.13)	-1.83 ***	(0.12)
Level 2: Students (n = 7935)								
Initial Level (Intercept)								
Spec. Educ.			-10.15 ***	(0.89)	-10.15 ***	(0.89)	-10.16 ***	(0.89)
FRL			-1.28 ***	(0.47)	-1.14 **	(0.46)	-1.20 **	(0.47)
Female			-0.30	(0.39)	-0.30	(0.39)	-0.30	(0.39)
Black			-5.58 ***	(0.57)	-5.30 ***	(0.58)	-5.45 ***	(0.57)
Other			-5.98 ***	(0.68)	-5.90 ***	(0.69)	-5.98 ***	(0.69)
Cohort 2			13.94 ***	(0.43)	13.94 ***	(0.43)	13.94 ***	(0.43)
Cohort 3			23.79 ***	(0.66)	23.78 ***	(0.66)	23.77 ***	(0.66)
School Year Growth per Month								
Spec. Educ.			-0.07 *	(0.04)	-0.07 *	(0.04)	-0.07 *	(0.04)
FRL			-0.04	(0.03)	-0.05 *	(0.03)	-0.05 *	(0.03)
Female			-0.08 ***	(0.02)	-0.08 ***	(0.02)	-0.08 ***	(0.02)
Black			-0.10 ***	(0.02)	-0.11 ***	(0.02)	-0.11 ***	(0.02)
Other			0.02	(0.03)	0.02	(0.03)	0.02	(0.03)
Cohort 2			-0.25 ***	(0.03)	-0.25 ***	(0.03)	-0.25 ***	(0.03)
Cohort 3			-0.35 ***	(0.05)	-0.35 ***	(0.05)	-0.35 ***	(0.05)
Summer Growth per Month								
Spec. Educ.			-0.34 *	(0.19)	-0.34 *	(0.18)	-0.35 *	(0.18)
FRL			0.11	(0.11)	0.14	(0.11)	0.12	(0.11)
Female			0.20 ***	(0.07)	0.20 ***	(0.07)	0.20 ***	(0.07)
Black			-0.10	(0.09)	-0.02	(0.09)	-0.05	(0.09)
Other			-0.05	(0.12)	-0.03	(0.12)	-0.06	(0.12)
Cohort 2			0.09	(0.10)	0.10	(0.10)	0.09	(0.10)
Cohort 3			-0.14	(0.19)	-0.14	(0.19)	-0.15	(0.19)
Level 3: Schools/Neighborhoods (n = 40)								
Initial Level (Intercept)								
School Disadvantage					-2.77 ***	(0.40)		
NB Assets							-0.66	(0.40)
NB SES							1.60 ***	(0.70)
School Year Growth per Month								
School Disadvantage					0.07 ***	(0.02)		
NB Assets							0.00	(0.02)
NB SES							-0.06 *	(0.03)
Summer Growth per Month								
School Disadvantage					-0.35 ***	(0.08)		
NB Assets							0.12 *	(0.07)
NB SES							0.52 ***	(0.12)

Variance Components from Model 1	***Within Sch. & Neigh.***		***Between Sch. & Neigh.***		***Total Variation***		***Intraclass Correlation***
Initial Level (Intercept)	191.04 ***	(13.82)	28.45 ***	(5.33)	219.49	(14.82)	0.13
School Year Growth per Month	0.04 ***	(0.20)	0.03 ***	(0.17)	0.07	(0.26)	0.42
Summer Growth per Month	0.09 ***	(0.31)	0.36 ***	(0.60)	0.46	(0.68)	0.80

in mathematics over the course of the school year. Concomitantly, the average student losses 4.57 points over the course of the summer (approximately 2.75 months) or roughly 33 percent of the gains made during the school year. Estimates of the seasonal slopes in reading are similar to those for mathematics in direction although of somewhat slighter magnitude (Table 3, Model 1).

Similar to findings in the ECLS-K data (Downey et al. 2004), I find that inequalities between students in achievement growth, and inequalities between schools and neighborhoods are much lower during the school year than during the summer. Evidence for this can be seen in the estimated variance components and their standard errors from the unconditional model (Table 2 & 3; Second Panel) for the intercept and the seasonal slopes. During the summer the standard deviation in average mathematics growth between students within schools or neighborhoods is 1.5 times larger than it is during the school year. Variation between school and neighborhood contexts is even greater with the standard deviation in mathematics growth 3.6 times larger during the summer than during the school year. Variation in reading achievement between students within schools and neighborhoods during the school year is virtually the same magnitude as during the summer. However, between schools and neighborhoods, the standard deviation during the summer is twice the size of the school year standard deviation.

Taken together these findings indicate that schools work to lessen inequalities between students within the same schools and neighborhoods that are much greater when students are out of school and in differing home environments. Furthermore, we can see that schools also tend to reign in the larger inequalities that lie between schools and neighborhoods in the summer. One important caveat to remember here is that because the summer exposure estimates on achievement growth are derived by an extrapolated adjustment between the beginning and end of the school year and the time of testing that these estimates, by construction contain some amount of noise or measurement error than the school year slopes.

Table 3: School and Neighborhood Effects on Seasonal Learning Growth in Reading

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*SE*	*Coefficient*	*SE*	*Coefficient*	*SE*	*Coefficient*	*SE*
Level 1: Test Events (n = 28,496)								
Initial Level (Intercept)	182.91 ***	(1.22)	175.75 ***	(1.57)	175.46 ***	(1.12)	175.63 ***	(1.24)
School Year Growth per Month	1.30 ***	(0.05)	1.70 ***	(0.06)	1.70 ***	(0.06)	1.70 ***	(0.06)
Summer Growth per Month	-1.33 ***	(0.11)	-1.61 ***	(0.15)	-1.62 ***	(0.18)	-1.64 ***	(0.16)
Level 2: Students (n = 7935)								
Initial Level (Intercept)								
Spec. Educ.			-14.71 ***	(1.09)	-14.73 ***	(1.09)	-14.73 ***	(1.09)
FRL			-2.16 ***	(0.60)	-2.04 ***	(0.59)	-2.11 ***	(0.59)
Female			3.42 ***	(0.42)	3.42 ***	(0.42)	3.42 ***	(0.42)
Black			-5.07 ***	(0.72)	-4.78 ***	(0.73)	-4.96 ***	(0.71)
Other			-8.54 ***	(1.17)	-8.45 ***	(1.17)	-8.54 ***	(1.17)
Cohort 2			13.67 ***	(0.56)	13.67 ***	(0.56)	13.67 ***	(0.56)
Cohort 3			21.66 ***	(0.71)	21.65 ***	(0.71)	21.65 ***	(0.70)
School Year Growth per Month								
Spec. Educ.			0.05	(0.05)	0.05	(0.05)	0.05	(0.05)
FRL			0.03	(0.03)	0.03	(0.04)	0.03	(0.04)
Female			-0.17 ***	(0.02)	-0.17 ***	(0.02)	-0.17 ***	(0.02)
Black			-0.07 **	(0.03)	-0.07 **	(0.03)	-0.08 ***	(0.03)
Other			0.05	(0.05)	0.05	(0.05)	0.05	(0.05)
Cohort 2			-0.39 ***	(0.04)	-0.39 ***	(0.04)	-0.39 ***	(0.04)
Cohort 3			-0.49 ***	(0.05)	-0.49 ***	(0.05)	-0.49 ***	(0.05)
Summer Growth per Month								
Spec. Educ.			0.05	(0.16)	0.05	(0.16)	0.04	(0.16)
FRL			-0.14	(0.11)	-0.14	(0.13)	-0.13	(0.13)
Female			0.41 ***	(0.08)	0.40 ***	(0.08)	0.40 ***	(0.08)
Black			0.05	(0.11)	0.06	(0.11)	0.08	(0.11)
Other			-0.22	(0.14)	-0.22	(0.14)	-0.22	(0.14)
Cohort 2			0.27 ***	(0.10)	0.27 ***	(0.10)	0.27 ***	(0.10)
Cohort 3			0.07	(0.16)	0.07	(0.16)	0.06	(0.16)
Level 3: Schools/Neighborhoods (n = 40)								
Initial Level (Intercept)								
School Disadvantage					-4.45 ***	(0.54)		
NB Assets							-0.36	(0.72)
NB SES							3.72 ***	(0.73)
School Year Growth per Month								
School Disadvantage					0.07 *	(0.04)		
NB Assets							-0.01	(0.03)
NB SES							-0.08 *	(0.04)
Summer Growth per Month								
School Disadvantage					-0.20 *	(0.11)		
NB Assets							0.04	(0.07)
NB SES							0.28 **	(0.11)

Variance Components from Model 1	***Within Sch. & Neigh.***		***Between Sch. & Neigh.***		***Total Variation***		***Intraclass Correlation***
Initial Level (Intercept)	265.34 ***	16.29	56.92 ***	7.54	322.26	17.95	0.18
School Year Growth per Month	0.15 ***	0.39	0.08 ***	0.28	0.23	0.48	0.34
Summer Growth per Month	0.15 ***	0.39	0.40 ***	0.64	0.56	0.75	0.72

Further evidence of the equalizing function of schools can be seen in the calculation of the intraclass correlation coefficient (ICC)[8] for each of the seasonal slopes. With the ICC we can estimate the amount of variation in student achievement growth that is attributable to differences between school and neighborhood contexts during the given season. The last column of the second panel of Table 2 shows that 42 percent of the variance in student

[8] The ICC is defined as the variation at the third level divided by the total variation in the estimate.

mathematics achievement growth during the school year is attributable to differences between schools within the district. During the summer 80 percent of the variance in mathematics growth is due to differences between neighborhoods. Findings in reading are of a slightly smaller magnitude but very similar to those for mathematics. We can see that during the school year much less of the variance in student achievement growth lies between schools than during the summer. It is also important to note that the amount of variance that lies between schools, 34 percent, is larger than we might have expected. Typically in educational research we would expect the variation between schools to lie in the range of 10 to 30 percent. The fact that the estimated ICC in these data is larger than expected may stem from the large inequalities between schools with respect to the distribution of students of color and lower socioeconomic status within this district.

Seasonal Inequalities between Students

How do seasonal growth rates vary across different types of students? The estimates of my second set of models indicates that there are significant differences between students of different socioeconomic status and racial-ethnic groups both in terms of their average initial achievement at the beginning of the second grade and during the school year in both mathematics and reading (Table 2 and Table 3, Model 2). The average white student in the District enters the second grade with an initial estimated mathematics score of 181.61 points. The average African American and other race-ethnicity student enters the second grade 5.58 and 5.98 points respectively behind their white peers. When expressed as a standardized effect size (es) of group mean difference, these inequalities in initial status at the beginning are quite large (-0.32; -0.35) and can be thought of as accumulated inequality during the early

grades (K-1) of elementary school and pre-school entry. In reading, the average white student enters the second grade with an estimated reading test score of 175.75 while the average African American student enters with a score of 170.68 (es = -0.29) and the average other race-ethnicity student enters with a score of 167.21 (es = -0.49).

During the school year the average African American student is estimated to gain 0.10 points less per month than their white peers in mathematics and 0.08 less in reading. Over the course of a typical school year in both subjects, the average African American student will have gained almost a full point less than their average white peer (0.96 points in mathematics and 0.76 points in reading). I estimate no difference between other race-ethnicity students and white students in school year achievement growth in either subject.

In terms of student level socioeconomic inequalities I do not find any significant difference between students who receive free and reduced priced lunch and those who do not during either the school year or summer in both mathematics and reading. However I do estimate that the average FRL student begins the second grade 1.28 points behind their less advantaged peers in mathematics and 2.16 points behind in reading achievement.

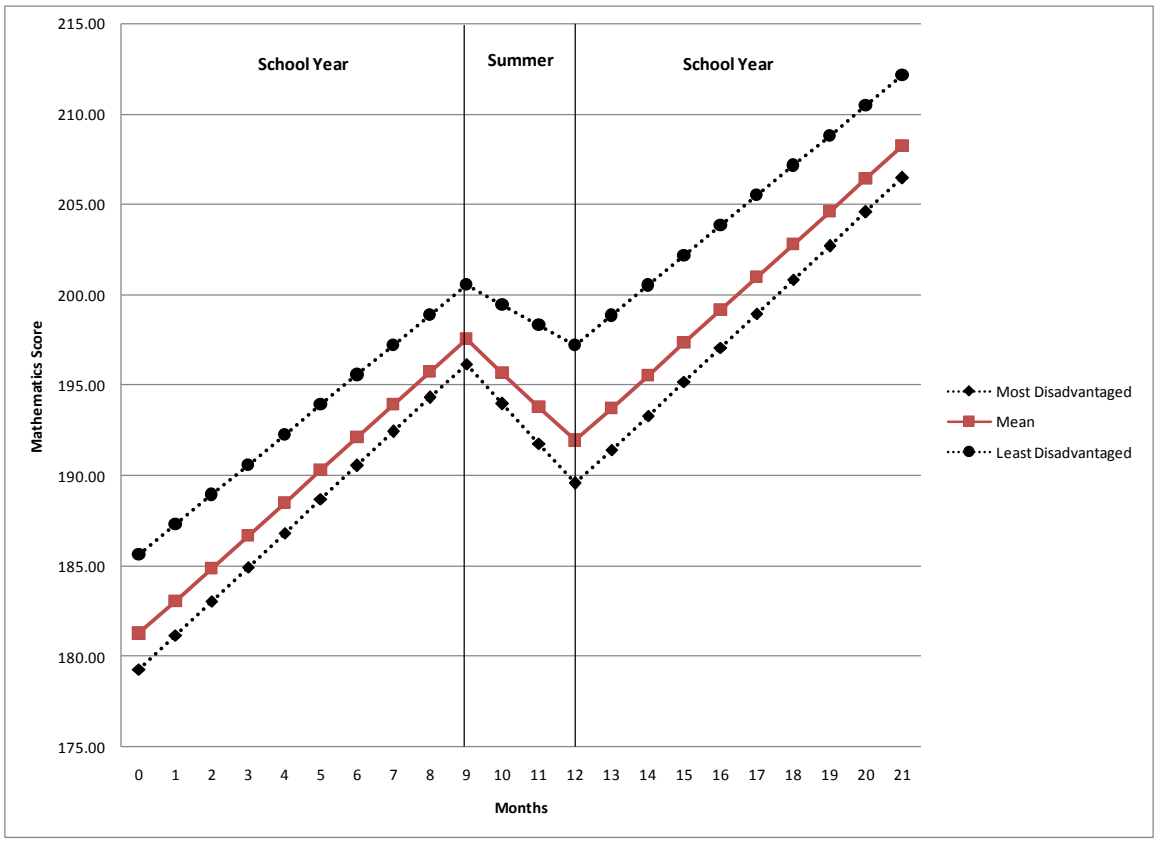
Inequalities in School Contexts

How do differences in school contexts explain inequalities in students' school year and summer learning growth in mathematics and reading? From the school context variable entered into Model 3 (Table 2) we can see that the measure of a school's disadvantage exerts a significant influence on student mathematics growth at the beginning of the second grade, during the school year and also during the summer. The estimated effect of school disadvantage on initial achievement level at the beginning of second grade is -2.77 points.

This indicates that a student in a school that has a school disadvantage one standard deviation above the grand mean of the sample will enter the second grade 2.77 (es = 0.16) points behind a peer of the same ascriptive characteristics (e.g., race, socioeconomic status, gender) enrolled in a school that is at the grand mean of the sample in school disadvantage. During the school year we see that students in more disadvantaged schools are estimated to gain 0.07 points per month more in mathematics than similar students in a more advantaged school. In the summer time the effect of school disadvantage is negative and much stronger whereby a student enrolled in a school that is one standard deviation higher in school disadvantage is estimated to lose 0.35 points per month more than a similar student enrolled in a school at the mean of school disadvantage. In reading I estimate similar significant effects of school disadvantage on student achievement growth (see Table 3) at the beginning of the second grade (-4.45 points), during the school year (0.07 points per month), and summer (-0.20 points per month).

To appreciate how considerable the effect of school disadvantage is on student achievement growth consider Figure 3, which plots hypothetical mathematics growth trajectories of an average second grade student in the most disadvantaged school (*school disadvantage* = 0.97), a school with the grand mean of disadvantage (0.00) and a school that is the least disadvantaged (-2.15) over two school years and the intervening summer. At the beginning of the second grade (months = 0) the gap between a student in the most advantaged school and the least advantaged school is estimated to be 8.64 points. At the

Figure 3: Effect of School Disadvantage on Average Mathematics Growth



end of the school year, 9 months later, the gap has been reduced to 6.68 points. After the summer (3 months) when school is not in session the gap widens again to 9.95 points, higher than it was at the beginning of the previous school year. The gap again closes by 1.97 points over the course of a second school year.

Neighborhood Contextual Effects

How do neighborhood contexts affect children's mathematics and reading achievement growth across seasons? As expected, neighborhood socioeconomic status has a large influence on the growth rates of students during both the school year and during the summer in both subjects. Much like the measure of school disadvantage, neighborhood

socioeconomic status is related to higher initial achievement in mathematics (1.60 points) and reading (3.72) at the beginning of the second grade and higher growth rates during the summer in both subjects (0.52 and 0.28 respectively). As with the case of the differential effect of school disadvantage across seasons, children in neighborhoods with lower socioeconomic status have higher achievement growth during the school year relative to peers from more advantaged neighborhoods, but these gains are offset by a much larger estimated negative effect of the neighborhood context during the summer.

In only one instance do I find a relationship between the per capita number of institutional assets and elementary students' achievement growth. During the summer, students who reside in neighborhoods with more institutional assets have lower per month losses in mathematics. For example an average student residing in a neighborhood with two additional institutional assets (approximately one standard deviation above the grand mean) is predicted to lose 0.24 points per month less in mathematics. I find no evidence of a significant effect of institutional assets during the school year or in initial achievement levels or for reading achievement growth in any season.

School and Neighborhood Contexts and Achievement Gaps between Students

What effect do the between school and neighborhood contextual differences have on the estimated African American-white and socioeconomic gaps in mathematics and reading achievement growth? After controlling for neighborhood contexts, the estimates of these gaps are not mediated, in fact they increase slightly. Comparing the estimates on African American for Model 4 to those for Model 2 (Table 2 and Table 3) we can see that the estimate for mathematics growth during the school year increases from -0.10 to -0.11 points

per month and for reading remains unchanged at -0.08 points per month. I estimate no socioeconomic gap between students in reading achievement growth during either the school year or summer, however in mathematics growth during the school year, once school and neighborhood contextual factors are controlled, I do estimate a statistically significant gap which was not present in Model 2 which did not control for differences between schools and neighborhoods. The effect of being a free and reduced priced lunch eligible student enrolled in the average school or living in the average neighborhood (i.e. a school or neighborhood at the district grand mean for all contextual variables) is related to a decrease in school year growth of 0.05 points per month.

Discussion

This study reconfirms the findings of past seasonal research that there are seasons to learning and that inequalities in learning growth during the summer have significant and consequential effects on the development of children's academic achievement trajectories in elementary school. This study shows that within the context of a locality that is marked by a high level of racial-ethnic and socioeconomic segregation based on residential patterns that the magnitude of summer loss may be greater than has been previously estimated in nationally representative data. Furthermore, this study confirms and strengthens evidence that the neighborhood contexts in which children live and inhabit when out of school during the summer exert a considerable influence on the appearance and perpetuation of socioeconomic achievement gaps. To the extent that race-ethnicity and socioeconomic status are highly linked in this sample and in much of American neighborhoods and schools these

deleterious neighborhood contexts help to explain racial-ethnic gaps in student achievement as well.

On its face it would appear that schools have no effect on socioeconomic and African American-white achievement gaps. In fact within this sample of students and schools it appears that the school and schooling are in part a cause of some of the gap in achievement in reading and mathematics between students in the same school, for even after controlling for school and neighborhood contexts slight achievement gaps still remain during the school year when no such gaps exist during the summer. Some have sought to explain these gaps in reading, and less so mathematics, as perhaps stemming from cultural or sociolinguistic differences between students and their teachers who may come from different racial-ethnic and socioeconomic backgrounds (Entwisle and Alexander 1994). However in this sample no school year achievement growth gaps between other ethnicity students (mostly Hispanic in this sample) and white students were found, casting some doubt on cultural or sociolinguistic differences as being the main driver of racial-ethnic achievement gaps.

What then explains the estimation of an African American-white gap, but no other-white gap? First, estimates of within school racial-ethnic gaps depend on both the sample sizes of the groups and the relative distribution of those groups within a given school's enrollment. Estimates of the other race-ethnicity achievement gap depend on a relatively small number of students and therefore contain more noise and measurement error and therefore there is limited statistical power to identify an effect if it did in fact exist. This may potentially contribute to the insignificant estimate.

Although we cannot readily dismiss the possibility of a systematic school effect that works to disadvantage African American students, we must not lose sight of the larger

picture of the role that schools play in equalizing inequalities stemming from neighborhood contexts. Recall this school district is marked by a high level of residential socioeconomic and racial-ethnic segregation and concomitantly the schools reflect this segregation in their student enrollments. Therefore, we must consider that a African American child who lives in the most disadvantaged neighborhood and goes to a school that is racial and socioeconomically segregated learns at a faster rate than a peer in more advantaged contexts. This indicates that in the areas where they are most needed, schools do make a difference in the learning growth in reading and mathematics of the students they serve and ameliorate the very large disadvantages that those students accrue from their neighborhood contexts during the summer when school is not in session.

What should we take from these findings in terms of potential solutions to the persistent racial-ethnic and socioeconomic achievement gaps between students? The obvious solution that this research points to is to extend the school calendar, increasing the amount of time that children are in school. In international comparisons the United States continually lags behind its industrialized peers in student achievement, especially in mathematics. Further, the instructional school year in the United States is considerably shorter than the school year in other industrialized countries. For example the average Japanese 13 year old will spend 42 more days in formal instruction than the average American 13 year old during the school year and will have significantly better mathematics achievement. (U.S. Department of Education, National Center for Education Statistics 2000). While these statistics are not causal, they are suggestive of the possible or potential effect of longer instructional school years. Although extending the school year would mean further burdening strained school budgets in terms of the cost of teacher salaries and physical plant

expenses, the potential benefit to students, the communities in which they live, and the nation as a whole would far out weight those costs.

The finding that neighborhood contexts, measured by socioeconomic status and institutional assets, influence children's achievement growth during the summer time affirms, at least partially, the faucet theory of seasonal inequalities; access to resources during the summer time partially ameliorated achievement losses among elementary school children in this district. This has been a consistent finding in seasonal research and clearly points to the creation of quality summer time learning opportunities and programs for children, especially those who live in disadvantaged communities. This is especially poignant in light of recent cuts in school districts across the country of summer time enrichment programs due to budget deficits (Dillion 2009). If we are interested in closing achievement gaps and inequalities among American school children we should be wary of widespread cuts in summer programs by school districts as these programs, and the access to the learning resources they provide during the summer to disadvantaged students who need them the most.

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APPENDIX

Construction of School Attendance Zones

School attendance zone maps were unavailable for schools within the Metropolitan Public School District. MPSD does not publish these maps on their website nor are they available from individual school websites. Further, a search of the *Internet Archive*[9] of MPSD web pages from 2001 to 2008 also failed to uncover any published attendance zone maps. An exhaustive search was undertaken to locate these maps from publicly available sources other than the MPSD such as the County GIS department, real estate agents and sites, and city and community websites of localities within the County. None of these searches uncovered maps of the school attendance zones. Finally the school district was contacted directly in an effort to locate school attendance zone maps. The district was either unable or unwilling to provide these maps.

In order to construct the attendance zones I geocoded all school bus stops and routes for each school in the MPSD. This information is published and publically available on the MPSD website. Once all bus stops and routes were mapped clear boundaries between schools emerged. These boundaries between schools were easily seen when bus routes from two neighboring schools used the same road, but picked up students from bus stops and neighborhoods located on opposite sides of the thoroughfare. Further, the County is marked by many water features including rivers and streams which formed natural boundaries to school attendance zones.

[9] The Internet Archive is a 501(c)(3) non-profit that was founded in 1996 that is working to preserve digital media so that it will be available now and in the future. In addition to archiving text, audio, and moving images the Internet Archive also archives web pages such that it is possible to look at previous versions of web pages for any web domain. By typing in a web domain address the Internet Archive presents the user with a matrix of years and dates within years in which changes were made on web pages of the domain and which are indexed and archived. By searching this way it is possible to recover information that was once publically available on a domain, but is no longer available.

CHAPTER III

WHY WHO CHOOSES AND WHY? CHARTER SCHOOL CHOICE PATTERNS AMONG INDIANAPOLIS PARENTS

Many of the heated debates surrounding school choice in general and charter school specifically have been around the types of students who will choose to leave their regular or traditional public school (TPS) in favor of enrolling in a charter public school (CPS) and the possible effects on the schools that they are leaving behind (Henig 1994; Schneider, Teske, and Marschall 2000). Critics of charter schools claim that CPSs will "skim off" the highest achieving students from the TPSs and that charter schools will lead to the further segregation of schools along racial and ethnic lines. Indianapolis is no different than any other locality with respect to these debates and concerns about charter schools. In 2006 the Indianapolis Public Schools superintendent requested a moratorium on the opening of new charter schools because he claimed that they were "luring" away many students from the district and that the district would need to consider closing schools and discontinuing programs if enrollments in the district continued to decline (The Indianapolis Star 2006).

Few would argue that increased parental involvement and active decision making in the education of their children is not something to be desired or encouraged in today's educational landscape. Public school choice policies, of which charter schools are one, by their very nature encourage this active participation, but as Witte and Thorn (1996) have noted, one of the most important sets of research questions in relation to the issue of public school choice is "Who chooses and Why?" This question set is important because as many have noted, there is a persistent fear, especially among opponents of public school choice

that expanded public school choice may lead to an increase in school segregation along racial/ethnic and socioeconomic lines (e.g. Henig, 1994, 1998; Kleitz, Weiher, Tedin, & Matland, 2000; Weiher & Tedin, 2002). Given this, it is important for us to understand what kinds of students choose to leave their current schools in favor of enrolling in charter schools so that researchers and policy makers can make more informed opinions on the effect of charter schools for parents, students and the public school districts within which they are located.

Using a unique dataset of mayoral charter schools in Indianapolis, Indiana, this paper compares parents' stated reasons for choosing the charter school that their children are currently enrolled in versus their revealed preferences as evidenced by their actual school switching behavior. The paper also addresses the implications of these preferences on racial-ethnic stratification. Specifically, I address the following research questions:

1. What are the demographic and academic achievement characteristics of students who choose to switch to a mayoral charter public school in Indianapolis?
2. What are the most important reasons that parents report when choosing a charter school for their child? Do these reasons differ among racial-ethnic and socioeconomic groups of parents?
3. How do these professed reasons for choice compare to actual choice behavior?
4. What are the effects of charter school choice on the sorting of Indianapolis students along racial-ethnic and achievement level dimensions?

School choice theory

An educational reform has gained traction and popularity over the last decade is the idea of public school choice, meaning that parents and students should have more choices in the types of schools that they attend. Over the last 10 to 15 years the ideas of public school choice have come increasingly to mean the creation of charter schools. From 1991 when Minnesota enacted the first charter school law, the number of charter schools in the United States has increased to approximately 4,500 schools operating in 40 states and the District of Columbia serving approximately 1.5 million students in 2008 (Center for Education Reform 2008). Charter schools, broadly speaking, are publicly funded schools that are granted some measure of independence from state and district regulations in exchange for accountability to increase student achievement (Kolderie 1990). It is in part due to this broad definition of charter schools that charter schools have wide appeal across divergent philosophical and ideological sectors of American society, with charter school proponents ranging across the liberal – conservative spectrum (Murphy and Shiffman 2002).

Proponents of charter schools point to an overly bureaucratic educational system that stifles teacher innovation and limits their ability to provide high quality instruction (Chubb and Moe 1990; Murphy and Shiffman 2002). By creating a charter school that is freed from state and district regulations, in such areas as curricula and the hiring of teachers, it is believed that they can operate more efficiently than regular public schools, both financially and instructionally. Charter proponents also state that the current public education system is a monopoly and as such has no incentive to change because it faces no threat of competition. If parents had multiple school options for their children, then it is thought that public schools will be forced to reform themselves and their practices and increase student achievement in

order to compete with charters to retain students and the moneys tied to those students (Bulkley and Fisler 2003; Chubb and Moe 1990; Murphy and Shiffman 2002).

Embedded within the market metaphor of school choice and charter school theory is the idea that parents and students will be able to become active consumers of an educational product, and as such, they will be able to make school choices that best fit their needs, educationally and socially. The underlying assumption of this market metaphor is that when given a wider choice in schools in which to enroll their children, parents will "shop around" (Schneider et al. 1998), weighing all available evidence and information on curricula, missions, services, etc. available from different schools and then will make an informed decision as to which school best fits with their own educational beliefs and needs.

One of the underlying arguments of charter school proponents is that by allowing parents and students to choose their schools, they will be better able to enroll in schools that more closely match their educational needs and values and thereby increase the likelihood of positive educational outcomes such as increased achievement and graduation. This is both a supply and a demand side argument. From the supply side, proponents argue that in order to remain in business, charter schools must be responsive to the needs and wants of the market and their consumers. On the demand side, parents and students, by exercising choice signal charter schools and the market on their preferences and desires for schools and education, whether in terms of curricula (e.g. "back to basics", Afro-centric, etc.) or other tangible and intangible characteristics.

Prior research on parental preferences in school choice and segregation

The racial-ethnic segregation of students has been a persistent problem and concern for American schools and school systems. Even though segregation based on law has been prohibited since the landmark Supreme Court ruling of *Brown v. Board of Education* in 1954, *de facto* segregation has remained and may in fact be on the rise. Using school level demographic data from the National Center for Education Statistics (NCES) Common Core of Data (CCD) from the late 1960s to 2006, Orfield and Lee (2007) note that in 2006 the average white student attends a school that is 77 percent white majority, while the average African American student attends a school that is 52 percent African American and only 30 percent white. Seventy-three percent of African American students are enrolled in American schools that are more than 50 percent minority, a level of segregation approaching that found in 1968 (77 percent). Further, 38 percent of African American students attend schools that can be categorized as intensely segregated, those schools that enroll a greater than 90 percent minority population.

Given the apparent rise in the re-segregation of American schools, it is important to consider the role that public school choice programs may have in exacerbating the problem. As Bifulco and Ladd (2006) note:

> Opponents of expanding school choice are concerned that, in the absence of provisions carefully designed to counter [re-segregation] trends, the more motivated and advantaged students will sort into high-quality schools with students largely like themselves, leaving the less-advantaged students even more concentrated in lower-quality educational environments than otherwise be the case. (p. 31)

The underlying fear is that parents, especially low income and less educated parents, will not choose schools based on educational quality; rather, they will base their choices on "noneducational criteria—where friends go to school…or simple proximity (Moe 2001:28) . As Schneider and Buckley (2002) state: the fear "…if white and wealthier parents select schools on the basis of racial makeup regardless of a school's instructional quality or curriculum, the end result could be highly segregated schools chosen on the basis of race and not academic achievement" (2002:134).

Empirical evidence of parental school preferences comes generally from two different sources. First, many studies have used surveys of parents to gauge the importance of various school characteristics (e.g., academic quality, racial composition, etc.) on their choices. Most of these surveys show that all parents, regardless of race-ethnicity or socioeconomic status, tend to indicate that academic quality of schools is at the top of their list of important characteristics (Smrekar 2009; Schneider and Buckley 2002).

In a telephone survey of approximately 1,600 residents in four New York metropolitan school districts, Schneider and colleagues (Schneider et al. 1998) examined how parents differed by race-ethnicity and socioeconomic status (as proxied by educational level) in their evaluation of the importance of four separate dimensions of schools: (1) academic quality measured by high test scores: (2) racial composition; (3) values; and (4) discipline. They found that African American parents and those who had graduated high school but had not attended college were more likely to indicate that academic quality was important compared with parents of other racial-ethnic groups or education levels.[10] Schneider et al. also found that racial similarity of a school student body to the parent's own

[10] It is important to note that of the four dimensions reported in their analysis, academic quality was the most probable first or second response for all types of parents, regardless of race-ethnicity or education level.

race-ethnicity was rarely reported as important. In terms of racial diversity they found that white and college educated parents were more likely to indicate this factor as more important than minority and less educated parents.

Armor and Peiser (1998) studied household school preferences in the context of inter-district choice in Massachusetts. They also found that the majority of parents state that academic quality is a primary concern in choosing schools and further found little evidence for there to be much variation between white and African American households. In surveys of Texas charter school parents, Kleitz, Weiher, Tedin, and Matland (2000) found little difference between race and class of parents and their stated preference for schools. Regardless of group (i.e., race by socioeconomic status) the researchers found that a majority of parents stated that academic quality and school and classroom size were important to them.

As Weiher and Tedin (2002:81) clearly state the problem with many of these studies: "A common weakness of this research into the ethnic and racial implications of choice for choosers themselves is that the linkage between respondents' stated preferences and actual racial and ethnic patterns in choice schools tend to be tenuous" (p. 81). One obvious reason for this is the social undesirability of expressing racial/ethnic reasons for choosing a school. Even if it were a response option on a survey, it is highly unlikely that parents would be willing to choose this response, even if racial-ethnic concerns were driving their decisions and choices in schools.

To address the concerns raised about parent survey responses, some researchers have compared the actual racial-ethnic and income level of the enrolled student populations of schools of choice and traditional public schools. Several studies of charter schools have reported that, on average, charter schools do not appear to inordinately enroll larger

proportions of minorities or economically disadvantaged students than do the public school districts in which they are located (Gill et al. 2007; Frankenberg and Lee 2003; Miron and Nelson 2002). Unfortunately, studies that only look at charter schools in the aggregate are missing significant variation in student body demographics at the individual school levels, and may not be able to adequately shed light on individual charter schools and the changes in the racial composition of peers when students switch into charter schools (Bifulco and Ladd 2006).

In order to investigate the effects of school choice on individual schools and students it is necessary to have longitudinal student level data that allows the tracking of students from their school of enrollment prior to making a switch to a school of choice (Zimmer et al. 2009). Owing in part to the difficulty in obtaining such data, to date only a handful of research studies have been able to approach the question of segregation and charter schools in this way. In a study of California and Texas charter school students Booker, Zimmer, and Buddin (2005) found that in both states it appears that charter schools are not "cream skimming" the best students as many opponents of charters fear, rather they appear to be targeting lower achieving or more at-risk students. Secondly, the authors found that charter schools in both states are having an effect on the racial-ethnic sorting of students specifically, "black students in particular tend to move to charter schools that have a higher percentage of black students and are more racially concentrated than the public schools they leave" (p. 22).

In a similar investigation of segregation in North Carolina charter schools, Bifulco and Ladd (2006) also found results of student sorting based on race-ethnicity and concluded that "charter schools in North Carolina clearly increase the extent to which students are racially segregated" (p. 40). Evidence for this conclusion came from comparing the changes

in racial-ethnic composition of schools for students who transferred to charter schools from traditional public schools. Using school level data from the CCD for the 2001-2002 school year, the authors found that students enrolled in a charter school are "two and a half times more likely to be enrolled in a racially unbalanced school" than if they were in a traditional public school (p. 37).[11] Noting that aggregate data may mask important variation Bifulco and Ladd compared changes in the peer environment for a sample of 6,480 students who transferred to a charter school from a traditional public school between 1996 and 2000. They found that "students who choose to enroll in North Carolina charter schools tend to end up in schools and grades with higher percentages of student who look more like themselves racially and in terms of family background (parental education) than was the case in their traditional public schools" (p. 40). African American students attended charter schools that were 18.6 percent more African American and white students enrolled in charter schools that were 10.7 percent less African American. Further, African American 'switchers' moved to charter schools whose average achievement in mathematics and reading on North Carolina end of grade testing was markedly lower than the school from which they came, while white students tended to enroll in charter schools that had higher average mathematics and reading achievement than the traditional public schools they left.

In the most recent study to date of this type, Zimmer et al. (2009) looked at switching patterns of traditional public school students who had switched to a charter school in seven sites[12] compared to non-switchers from the same districts and states. In all but one case (reading scores in Chicago) they found that charter school switchers had achievement scores

[11] A 'racially unbalanced school is defined as a school in which the African American enrollment is 20 percentage points higher or lower than the percent African American enrollment in the district in which the school is located.

[12] Chicago, IL; Denver, CO; Milwaukee, WI; Philadelphia, PA; San Diego, CA; OH; TX

that were on average below those of their non-switching peers. When disaggregated by race-ethnicity comparisons showed that African-American switchers had lower scores in five of the seven sites and Hispanic switchers had lower average achievement in four of seven sites (compared to their same ethnicity non-switching peers). In contrast white switchers in four of the seven sites had achievement scores that were higher than their white non-switching peers.

In terms of the racial distribution of students Zimmer et al. found that in general across the seven sites that charter school switchers were moving to charter schools that had racial distributions that were similar to the traditional public schools that they left. Comparisons across racial-ethnic groups found that African American switchers moved to a charter school with a concentration of African American students that was 3.8 percentage points higher than their previous traditional public school. White students transferred to a charter school with 1.3 percentage points higher white enrollment and Hispanic students switched to a charter school with 5.9 percentage points fewer Hispanic students than their previous traditional public school. The authors concluded that there was no systematic evidence across the seven sites to indicate that charter schools "dramatically affect the racial mix of school for transferring students (Zimmer et al. 2009:19)." However, like the Bifulco and Ladd's (2006) study in North Carolina, the authors concluded that there was some evidence that African American switchers were more likely to move to a charter school with higher percentages of students of their own race.

The findings across these three studies (Booker et al. 2005; Bifulco and Ladd 2006; Zimmer et al. 2009) highlight the importance that local contexts in considering the potential of charter schools to play a role in the racial-ethnic sorting of students; in some localities

there is some evidence of preferences among charter school switchers for schools that enroll higher proportions of students of the same race-ethnicity while in other localities there is little or no evidence of such preferences. This study adds to this literature and line of research by investigating the switching behavior of charter school students in Indianapolis.

Data & Methods

In the spring of 2007, the National Center on School Choice administered surveys to parents with children enrolled in mayoral charter schools in operation in Indianapolis. Parents of entry year students were excluded from the survey effort as they were in their first year of interaction with their charter school and their responses may have reflected this by being overly positive. Parents were offered a $15 gift card if they returned the survey and classes (homerooms) received a $200 gift card if 80 percent of the classroom returned the survey. These procedures resulted in 84 percent of parents responding, for a total of 2,493 parents. Further, school level demographic information (enrollment, charter age, indicator of mandatory parent involvement through school contracts, and the percentage of minority students enrolled in the school) for the 2006-2007 school year was collected from either the school's webpage or through telephone inquiries directly to the school.

As part of the survey parents were asked, "Which two reasons listed below were the most important when you thought about sending your child to this school?" Parents were then instructed to indicate their first and second reason for the choice in the order of importance from the following response options: a) Size; b) Extra-curricular activities; c) Academic quality; d) Services for special needs students; e)Academic focus; f) Opportunities for parent involvement; g) Safety at school; h) Discipline at school; i) School location; j)

Other. Parents who indicated other were instructed to write in their reason in a free-response space. Further, parents indicated their race-ethnicity as well as their approximate yearly income and their level of education from which I create a socioeconomic status (SES) index, broken into quintiles (1 = lowest SES quintile, 5 = highest SES quintile).

To investigate the actual behavior of charter school switchers, I use data from the Northwest Evaluation Association's (NWEA) growth research database (GRD) of student testing records that has been linked to school demographic data from the National Center for Education Statistics Core of Common Data. NWEA is a non-profit student achievement testing company that tests students in grades 2 through 10 in mathematics, reading and language arts. From the 2002-2003 to the 2005-2006 school year the Indianapolis Public Schools and other metropolitan public school districts located within Marion County, Indiana contracted with NWEA to provide testing in both the fall and spring semesters. Also during this time period all of the mayoral charter schools contracted with NWEA for testing.

Of the 16 mayoral charter schools one school was excluded because it serves a unique population of students that are recovering from drug and alcohol dependency. From the approximately 2,500 students who were tested in one of the remaining 15 mayoral charter schools I was able to locate 1,050 students in their school of enrollment prior to switching to a charter school. These students represent approximately 43 percent of the total students enrolled in the 15 mayoral charter schools in grades 2 through 10 in the 2006-2007 school year.[13] To these data I have merged school level demographic information from the National Center of Education Statistics Common Core of Data (CCD) and school level Average

[13] This number is low for a number of reasons. I can only track students if they were previously enrolled in a school that contracted with NWEA for testing in grades 2 - 10. Further I cannot track students who have only ever been enrolled in their current charter school.

Yearly Progress (AYP) determinations from the State of Indiana's Department of Education publicly reported school report cards from 2002 – 2007.

Using this unique data set I am able to track students who were enrolled and tested in one of the Indianapolis mayoral charter public schools in the 2006-2007 school year and for whom a testing record was available in the school in which they were enrolled in immediately prior to switching to their current CPS. This allows me to compare students' previous schools to their current charter schools in terms of racial-ethnic demographics and academic achievement as measured by AYP status under the state of Indiana's No Child Left Behind plan.

Results

What kinds of students are enrolling in Indianapolis charter schools and from what types of other schools are they coming? Approximately 73 percent of charter school switchers in this sample were previously enrolled in a school in the Indianapolis Public School (IPS) district; 55 percent from a traditional public school and 18 percent from an IPS magnet school (see Table 4). A further 18 percent of charter school switchers come from a traditional public school that is located in a public school district other than IPS. Finally, nine percent of the sample was previously enrolled in a different charter school from their currently enrolled charter school. In terms of race-ethnicity the majority of charter school switchers are black (59 percent). White students represent 33 percent of the sample and Hispanic students 5 percent. Other race-ethnicity students (e.g., Asian, Native American, etc.) are the least represented at 3 percent. These percentages are reflective of the racial-ethnic composition of the Indianapolis Public Schools from which the majority of these

students come.[14] Given that students of Hispanic and other race-ethnicity are sparsely or not represented in some categories of previous school type (see Table 4) the analysis that follows will not be conducted on these groups specifically, but they will be included in analysis of the sample as a whole.

Table 4: Charter school switchers by race-ethnicity and previous school type

Previous School	Student Race									
Type	Other		Black		White		Hispanic		Total	
	n	*pct*	*n*	*pct*	*n*	*pct*	*n*	*pct*	*n*	*pct*
Other CPS	1	3.4	81	13.0	12	3.5	0	0.0	94	9.0
IPS TPS	19	65.5	334	53.6	181	52.3	40	76.9	574	54.7
Magnet School	2	6.9	126	20.2	51	14.7	11	21.2	190	18.1
Other TPS	7	24.1	82	13.2	102	29.5	1	1.9	192	18.3
Total	29	2.8	623	59.3	346	33.0	52	5.0	1050	100.0

What do Indianapolis charter school students look like in terms of their academic achievement in mathematics in their prior school of enrollment? To investigate the academic achievement of charter school switchers I generated a variable that looks at the achievement level of the student in her previous school compared to proficiency levels as determined on the state achievement test in mathematics. NWEA mathematics achievement scores can be equated to a 'cut-score' that represents the state achievement test score needed to achieve a level of proficiency used for Adequate Yearly Progress under the No Child Left Behind statute (Adkins 2007). To create this proxy for proficiency on the state mathematics exam the NWEA determined 'cut-score' on the mathematics test for the grade level in which they were enrolled in the season before they moved to a CPS is compared to the student's

[14] IPS's student composition in the 2006-2007 school year was 59 percent black, 29 percent white, 12 percent Hispanic, and other race-ethnicity students less than 1 percent. Data comes from the National Center for Education Statistics Common Core of Data.

observed mathematics score during the same time period. The final variable is a dummy variable that indicates that the student's performance on the NWEA test indicated that there was a 'high' probability that the student would score at or above the proficiency level on the state test in mathematics. Similarly I create indicator variables for the other two categories of proficiency used by the state of Indiana (Not Pass indicates the student is below proficiency and Pass Plus indicates that the student's performance is advanced).

Table 5 presents a comparison of charter school switchers' academic performance in terms of Indiana state achievement categories broken down across racial-ethnic groups and previous school type. To serve as a comparison, the three year average performance (2003-2006) of all IPS students by racial-ethnic group and Indiana state achievement categories is presented in the last row of Table 5. Across all race-ethnicities and previous school type, the majority of charter school switchers are performing at or above the proficient level (57.7%; 45.0% Pass, 12.7% Pass +) on the state mathematics examination at the time they choose to move to a charter school as proxied by their NWEA mathematics score (see "All" columns in Table 5). Further we can see in the bottom panel of Table 5 that in comparison to the Indianapolis Public Schools (IPS),[15] overall, charter school switchers appear to be higher performers on the state mathematics test with over twice as many students scoring in the Pass + advanced category (12.7 percent versus 5.7 percent) and with approximately 5 percent fewer students scoring in the Not Pass category than their IPS peers. However, when broken down by previous school type we see a clear difference between those students who switched from outside of IPS and those who came from an IPS school (regular and magnet). For example, we see that overall, and for both black and white students, fewer students from

[15] IPS is the natural comparison for this sample of students as the vast majority switch to a charter from an IPS school.

outside the IPS system scoring in the Not Pass category and concomitantly more students scoring in the Pass + category than both the IPS system as a whole and students who switched from an IPS school (Rows 1 and 4 versus Rows 2, 3 and 6). Finally, when we look compare white and black former IPS switchers to the IPS average, we see that these students are both higher performing and lower performing than the district as a whole (Rows 2 and 3 versus Row 6). In summary, Table 5 does not present clear evidence that charter schools are 'cream skimming' the highest performing students, but are rather attracting students from all performance levels.

Table 5: Percentage of Students in Proficiency Levels on State Mathematics Exam by Student Race and Prior School Type

		White						Black						All[1]					
		Not Pass		Pass		Pass +		Not Pass		Pass		Pass +		Not Pass		Pass		Pass +	
Other CPS	%	16.7	*	50.0		33.3	*	35.8	***	51.9		12.3	***	33.0	**	52.1		14.9	**
	n	*2*		*6*		*4*		*81*		*42*		*10*		*83*		*48*		*14*	
IPS TPS	%	44.8		42.0	***	13.3	***	47.3	**	41.0		11.7	***	46.2		41.6	***	12.2	***
	n	*81*		*76*		*24*		*158*		*137*		*39*		*265*		*239*		*70*	
IPS Magnet	%	53.0	**	35.3	***	11.8		46.0		48.4		5.6	*	48.4		44.2		7.4	
	n	*27*		*18*		*6*		*58*		*61*		*7*		*92*		*84*		*14*	
Other TPS	%	32.4		52.9		14.7	**	31.7	***	51.2		17.1	***	31.3	***	52.6		16.1	***
	n	*33*		*54*		*15*		*26*		*42*		*14*		*60*		*101*		*30*	
Col. Totals		41.3		44.5	***	18.3	***	43.5	***	45.0		11.2	***	42.6		45.0	***	12.7	***
IPS Average[2]		38.7		55.3		6.0		53.1		44.9		1.9		44.6		49.8		5.7	

[1] All includes Hispanic and Other Ethnicity students not reported due to small *n* in some categories

[2] Average of IPS proficiency categories from 2003-2006

* significantly different from IPS average mean at the 0.10 level

** significantly different from IPS average mean at the 0.05 level

*** significantly different from IPS average mean at the 0.01 level

Parents' stated reasons for choosing a charter school

What are the most important criteria which parents state informed their decision to enroll their children in Indianapolis charter schools? Table 6 provides a breakdown of parental first and second choices for the most important reasons for their choice of charter school by parental race/ethnicity and socioeconomic status quintile (1 = lowest SES quintile, 5 = highest SES quintile). Several patterns emerge in Indianapolis charter school parents' most important reasons for making a choice design that conform to prior research findings.

Table 6: Parents Stated First Reason for School Choice by Race-ethnicity and Socioeconomic Quintile

	African American Parents					**White Parents**				
SES Quintile	*1*	*2*	*3*	*4*	*5*	*1*	*2*	*3*	*4*	*5*
Academic focus	0.26	0.27	0.24	0.26	0.22	0.17	0.16	0.24	0.24	0.21
Academic quality	0.40	0.39	0.50	0.45	0.49	0.29	0.41	0.38	0.34	0.35
Discipline at school	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.02	0.01
Extra-curricular activities	0.04	0.06	0.01	0.03	0.01	0.02	0.03	0.03	0.00	0.01
Opportunities for parent involvement	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Other.	0.00	0.00	0.01	0.01	0.03	0.04	0.01	0.04	0.04	0.10
Safety at school	0.03	0.04	0.01	0.01	0.02	0.06	0.06	0.06	0.08	0.03
School location	0.02	0.03	0.01	0.03	0.02	0.09	0.06	0.04	0.05	0.04
Services for special needs students	0.05	0.02	0.03	0.03	0.03	0.06	0.03	0.05	0.04	0.08
Size	0.16	0.14	0.16	0.15	0.16	0.24	0.21	0.15	0.17	0.16

First, regardless of race-ethnicity or socioeconomic group, parents predominately choose academic quality and focus of schools as their most important reason for choosing the charter school in which their child is currently enrolled. The most striking pattern that emerges is that African American parents, regardless of SES quintile, rank academics as their

most important first reason for choice, either as the "academic quality" of the school (range from 39 percent for lower middle SES parents to 50 percent for middle SES parents) or the "academic focus" of the school (range from 22 percent for upper SES parents to 27 percent for lower middle SES parents). Taking these two academic reason categories together, across all levels of socioeconomic status, fully 66 to 71 percent of parents indicate that these are the most important reasons for their choice of charter school.

Among white parents, academic reasons for their school choice also rank highly with the "academic quality" rating highest across all socioeconomic levels. Academic focus follows as the second most frequent reason for choice across socioeconomic levels of white parents with the exception of lower and lower-middle SES parents rating the size of the charter school as their most important reason for choosing their schools (24 percent and 21 percent respectively). Again, as we see with African American parents, the two academic reasons for choice are cited by a majority of parents as being the most important reason for choosing their current school (range from 46 percent of lower SES parents to 62 percent of middle SES parents).

From these results we can see that the stated reasons for choosing a school among Indianapolis charter school parents is in line with past research on parental preferences. Across race-ethnicity and socioeconomic status, most parents profess that the academic quality of the school is the most important factor in their choice. Secondary among their concerns are the size of the school, the location of the school and the disciplinary climate of the school. However as previously noted there is the potential for a strong social desirability in parents' responses as school quality and reform is perpetually in the spotlight in the US media and social discourse.

Assessing the academic "quality" of charter school choices

Do Indianapolis parents' actual choices of charter schools reinforce their state preferences from the survey findings? To inform this question I look at a potential indicator of academic quality that could reasonably inform parents' notions of a school's academic quality and which is widely available. This indicator is the Average Yearly Progress (AYP) status that is reported publicly every year for all schools under No Child Left Behind provisions. These AYP scores are reported in local news sources as well as on school, district and state websites and it is reasonable to assume that most parents consult this information when making decisions about school choices. If parents are making school choices based on perceived quality (as evidenced in the survey results), then we would expect to see parents making charter school choices that move their children from schools that failed to make AYP to schools that did make AYP, or at the very least they would be making horizontal moves between schools that did make AYP. I investigate this by comparing the AYP status of students previous school (the 'sending' school) with the AYP status of the charter to which they move (the 'receiving' school) in the year prior to the move.

The vast majority of switchers are moving from schools that failed to make AYP (Table 7). Overall 65.6 percent of students in this sample move from schools that have failed AYP in the school year prior to their switching to a charter school. This is true across race-ethnicities and previous school types with the exception of black students switching from other CPS. This would seem to indicate that there may be a push on parents to move from a poorly performing school and to look for other educational options in charter schools.

However, when we look at the schools that the students move to, the receiving schools, we see that parents are not moving in large percentages to schools that have passed

AYP as expected. Rather, only 29.8 percent of students are moving to charter schools that have passed AYP with 37.7 percent choosing charters that have failed to make AYP and the remaining choosing charters that are too new to have received an AYP designation. This pattern is consistent across both race-ethnicity and previous school type. Of particular interest in this pattern is the fact that large percentages of students and parents are choosing to move to new charter schools for which they did not have AYP determinations from which to assess quality. This may indicate that parents are utilizing other sources of information with which to gauge the educational quality of charter schools (i.e., visits to the schools, conversations with teachers and administrators, etc). However, it may indicate that while parents indicated in their survey responses overwhelmingly that academic quality was most important, there are other considerations in choosing a charter that were not as strongly expressed.

Table 7: Comparison of Sending and Receiving School AYP Status by Student Race and Previous School Type

Student Race	Previous School Type	School AYP Determination				
		Sending		Receiving		
		Passed	Failed	Passed	Failed	None
Black	Other CPS	57.5	42.5	24.7	32.1	43.2
	IPS TPS	31.7	68.3	32.3	33.5	34.1
	IPS Magnet	46.8	53.2	33.3	32.5	34.1
	Other TPS	26.8	73.2	22.0	42.7	35.4
	Col. Totals	37.5	62.5	0.27	0.45	28.0
White	Other CPS	27.3	72.7	33.3	50.0	16.7
	IPS TPS	36.5	63.5	37.6	39.8	22.7
	IPS Magnet	19.6	80.4	37.3	37.3	25.5
	Other TPS	19.6	80.4	2.9	56.9	40.2
	Col. Totals	28.7	71.3	30.2	34.3	35.5
Total	Other CPS	54.3	45.7	25.5	34.0	40.4
	IPS TPS	33.3	66.7	34.5	35.9	29.6
	IPS Magnet	37.4	62.6	35.8	33.2	31.1
	Other TPS	25.0	75.0	12.0	49.5	38.5
	Col. Totals	34.4	65.6	29.8	37.7	32.5

Relationship of charter school choice to racial-ethnic sorting of students

How do the previous schools of Indianapolis charter school students compare to their currently enrolled charter school in terms of demographics? As previously noted, opponents of charter schools are concerned that parents and students will choose to sort themselves into schools that enroll more students like themselves in terms of race-ethnicity, thereby leading to further segregation. One way to investigate this is to compare the relative mix of race-ethnicities in the previous schools to the currently enrolled charter school. To compare previous schools to current charters I create a measure of diversity used in other sociological studies (e.g. Tam & Basset, 2004).

From the results presented in the first panel of Table 8, we can see that in the aggregate CPS switchers are moving to CPS that are not much different in terms of the racial composition of black, and white students than their previous schools. The exceptions to this are those students who are switching from TPS which are located in districts other than IPS who are on average moving to charter schools that are seven percent more black and six percent less white than their previous schools. This is not wholly unexpected as suburban and rural districts around IPS from which the majority of these students are coming from have much lower percentages of minority students than IPS serves.

Table 8: Descriptive comparison of Students' Previous School Racial Composition to Current CPS Racial Composition

Student Race	Previous School Type	Pct Black			Pct White		
		Sending	Receiving	Difference	Sending	Receiving	Difference
All	Other CPS	71.1	71.3	0.3	24.4	25.1	0.8
	IPS TPS	59.9	60.1	0.2	30.1	31.8	1.7
	Magnet School	62.6	61.2	-1.4	31.0	33.6	2.6
	Other TPS	25.9	32.9	6.9	67.4	61.6	-5.8
Black	Other CPS	74.0	75.2	1.3	21.9	21.5	-0.4
	IPS TPS	73.1	77.8	4.7	18.2	15.5	-2.6
	Magnet School	72.1	74.3	2.1	22.8	21.3	-1.5
	Other TPS	46.9	63.8	17.0	42.2	28.9	-13.4
White	Other CPS	52.2	42.8	-9.4	40.8	51.7	10.9
	IPS TPS	41.2	34.2	-7.0	49.4	57.6	8.2
	Magnet School	41.2	32.3	-8.8	50.9	62.2	11.3
	Other TPS	9.7	10.0	0.3	87.1	86.2	-0.9
Black Average		66.5	72.8	6.3	26.3	21.8	-4.5
White Average		36.0	29.8	-6.2	57.0	64.4	7.4
Black Average excluding Other TPS		73.1	75.8	2.7	21.0	19.5	-1.5
White Average excluding Other TPS		44.8	36.4	-8.4	47.0	57.2	10.1

While in the aggregate it appears that students are switching to schools of similar racial composition, when disaggregated by the student's own race, a different pattern begins to emerge. The second and third panels of Table 8 indicate that both black and white

students are choosing to switch to charter schools that enroll higher percentages of their own race than did their previous schools. For example, black students who switch from IPS traditional public schools are choosing charter schools that are about five percent more black on average (receiving 77.8 percent, sending 73.1 percent, with difference of 4.7 percent) and about three percent less white on average than their previous school. In contrast, the average white student is switching from an IPS traditional public school to a CPS that enrolls eight percent more white students (receiving of 57.6 percent and sending of 49.4 percent for difference of 8.2 percent) and seven percent less black students on average than their previous school.

Another measure that can be used to assess the effects of racial-ethnic sorting is the ***absolute diversity index (ADI)*** which indexes the probability that any two students selected at random from a school's population of student will be from different race-ethnicities (Tam and Basset 2004). In this data the ADI is created in the following form:

$$ADI = \frac{1-(PctB^2+PctW^2+PctH^2+PctO^2)}{n^A} \quad (1)$$

Where the numerator (the sum of the squared percentages of ethnic groups represented in a school's enrollment subtracted from one) represents the probability that a student in a given school, picked at random, will encounter another student in the same school from a different ethnicity of their own. This probability is normalized by the factor n^A in the denominator. In the case of four ethnicities (black, white, Hispanic and other) this normalization factor equals 0.75. The ADI after normalization takes the range of 1 to 0, with a value of zero representing a school enrollment that is comprised of only one ethnicity. Values approaching one

represent more racial heterogeneous schools. By comparing the ADI for previous and current schools across racial-ethnic groups we will be able to see if students are moving to more or less diverse school environments. If charter schools are leading to increased segregation by race-ethnicity then we would expect to see the ADI for currently enrolled charter schools to be closer to zero than the ADI for the previous school.

With the only exception of white students who are coming from a TPS located in a district other than IPS, students from all racial groups are moving to schools that are less diverse than their previous schools. Table 9 presents comparisons of the ADI of current and previous schools by students' race and previous school type. These results provide additional support to the patterns of movement based on racial composition of schools. For example, on average a black student who switches from an IPS traditional public school (second panel) to a charter school is switching to a school whose ADI is 0.19 lower than their previous school. When expressed in terms of a standardized effect size the change in ADI for these students is -0.82. This indicates that these students are moving to schools that are much less diverse than their previous schools. When we combine that with the information on racial composition in Table 8, we can see that the lower ADI for charter schools is being driven by the fact that on average students are moving to schools that have higher percentages of black students and lower percentages of white students. With the exception of white students who are switching from traditional public schools outside of IPS all other categories of students are moving to schools that are much less diverse and are composed of more students of the same race-ethnicity.

Table 9: Comparison of average diversity index by switcher type and race-ethnicity

Previous School Type	Student Race	Sending School ADI	Receiving School ADI	Difference	Effect Size of Difference
Other CPS	Black	0.42	0.39	-0.03	-0.10
	White	0.66	0.50	-0.16	-0.77
IPS TPS	Black	0.54	0.34	-0.19	-0.82
	White	0.66	0.56	-0.10	-0.50
Magnet School	Black	0.51	0.38	-0.12	-0.48
	White	0.73	0.59	-0.14	-0.69
Other TPS	Black	0.67	0.27	-0.41	-1.83
	White	0.31	0.38	0.06	0.41

Discussion and Future Directions

This paper has asked as its central question, "Who chooses to switch to charter schools in Indianapolis and why?" Although the evidence presented here cannot fully explicate individual parent and student motivations for choosing to switch to a charter school, we can see that there may be some general patterns to these choices based on a student's own race/ethnicity, the racial composition of charter schools relative to previous schools, and academic achievement as measured in mathematics.

In terms of the "who" part of the question, it appears that mayoral charter schools in Indianapolis are attracting students from across racial-ethnic groups that are in proportion to the overall distribution of these groups enrolled in the Indianapolis Public School system. Further, there does not seem to be evidence of charter schools systematically creaming or skimming off the highest performing students from traditional public schools. Rather, we have seen that charter schools are enrolling both low performing students, whose NWEA

mathematics test scores indicate a high probability of the student being classified as not passing the state mathematics exam, as well as higher performing students, students with a high probability of scoring in the highest achievement category of the state mathematics exam. Although in the aggregate it does not appear that charter public schools are "cream skimming," it is important to note that the analysis presented here does not take into account variation in missions and school types within the charter public school sector itself. This distinction is important one that is increasingly being discussed by charter school researchers. It may be that when disaggregated by charter school type, we find that some schools attract disproportionate numbers of higher performing students due to their missions and offerings. In the future I plan to expand this paper to account for variation within the charter school sector.

Why do parents choose? Overwhelmingly parents indicate that school quality was the main driver of their choice of a charter public school in which to enroll their children. However, this reason for choice is less clear when parents' actual choices are examined in terms of the AYP status, a highly visible and public indicator of 'quality,' of the schools they choose verses the schools they are leaving. The majority of parents and students are leaving traditional public school that did not pass AYP in the year prior to their move (65 percent). On the one hand, this may indicate dissatisfaction on the part of parents and students with the academic quality of their previous school as a possible mechanism for the choice to switch to a charter public school. On the other hand, if school quality, at least as indicated by AYP, is a main driver of choices, then we would have expected to see parents choosing charter schools that have passed AYP, indicating a move to a 'higher quality' school. This was not the case with only one third of students on average, across racial-ethnic groups and previous

school type, choosing to enroll in a charter that had passed AYP. Most interesting is the finding that 32.5 percent of parents and students are choosing to enroll in charter schools that are new and therefore have no AYP designation. This may indicate that parents base their determination of school quality on indicators other than AYP such as personal contact with school personnel. It will be import in future research for us to unpack what is meant by school academic quality and further to better understand what specifically parents mean by academic quality. When parents speak of academic quality are they speaking of performance on standardized tests or are they referring to particular curricula and pedagogies (e.g., 'back to basics' focus on mathematics and reading, emphasis on the arts, or college preparation programs)?

Although the choice patterns presented here do not negate the parents' self report of academic quality as the main reasons for choosing to switch to a charter school, they do provide evidence that there may be other processes related to race-ethnicity operative in these choices that do not get measured by current surveys due to social desirability of response and the difficulty in asking pointed questions on matters of race and ethnicity.

In general, mayoral charter schools and parental choices of charter schools appear to be a segregating influence among school aged children in Indianapolis. Students appear to be self-selecting into charter schools that enroll more students of their own race/ethnicity, with this pattern being stronger for white students than for black students. Excluding students who move from traditional public schools in districts other than the Indianapolis public schools,[16] the average white student is choosing a charter school that enrolls 10.1 percent more white students and 8.4 percent fewer black students than their previously

[16] This category is an obvious outlier in comparison to the other types of previous traditional schools as the distribution of racial-ethnic groups in these districts serve higher proportions of white students and fewer minority students than IPS.

enrolled school. Concomitantly, black students are choosing to enroll in charters with enrollments that are 2.7 more black and 1.5 percent less white than their former schools. This finding is opposite of past research that has found this self-segregating tendency to be stronger for black students than for white students in Texas, California and North Carolina (Bifulco and Ladd 2006; Booker et al. 2005). Although it is important not to overgeneralize from this difference, it may indicate that there are different processes involved in self-selection into charters based on race in Indianapolis and the Midwest than in other sections of the country (i.e., the South and West) and warrants further research.

It is important to consider that although the evidence presented here would indicate that parents are self-segregating into charter schools with higher proportions of students that are of the same race-ethnicity, with the effect that charter schools exhibit much less diversity than the traditional public schools that students are leaving, that these conclusions are drawn under the implicit assumption that the choice set of parents includes all available charters and that parents are operating under perfect information about those charters with which to make the best decisions for their children. As Bifulco and Ladd (2006) note, "We can infer the preferences of black [and white] families vis-à-vis the racial mix of charter schools only if the choice sets for a sufficiently large number of black [and white] charter school students are not restricted to charter schools that are racially segregated (p. 48)." This may or may not be the case in Indianapolis, but with the current dataset and its lack of student residence information I am unable to investigate potential choice sets based on residential location that parents have to choose from. The finding that parents do not appear to weigh the AYP status of schools as an indicator of school academic quality as heavily as expected points to the

need in charter and school choice research to better understand the types of information and the sources of that information that parents use in making choices about schools.

Although this paper points to the potential of charter schools to be a further segregating influence in American schools, it is not a broad indictment of school choice and charter schools. Instead, it highlights the need for us to better understand the motivations and reasons behind self-selection into segregated school environments that may operate not only within school choice but within traditional public schools as well due to neighborhood schools and residential segregation (Wells 2009). Insights gained from further research could potentially help to create school choice policies that overcome locational and informational shortcomings that may lead to self-segregating choices that have been observed here and in other research.

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CHAPTER IV

EDUCATIONAL REPRODUCTION: SOCIOECONOMIC STATUS AND TEACHERS' INSTRUCTIONAL PRACTICES IN MATHEMATICS

Introduction

Since its inception, sociology has been in part concerned with understanding the observation that social class and the class structure of society is largely reproduced from one generation to another. How is it that the poor always seem to remain poor and the rich remain rich? Why does there seem to be a tendency for a child of working class parents to himself end up in a working class job or occupation after formal schooling has concluded? Many look to the school and the process of schooling as a likely source of the reproduction of social class in capitalist societies as it is an integral part of the life of the growing child and provides a link between the world of the family and the world of work found at the conclusion of formal schooling. As such, the school can and does exert a large influence on the potential and actual life course and life outcomes, in terms of occupation and disposition, of the students who pass through it. To the extent that schools actively or passively act such that social class status and positions are retained more or less statically from one generation to the next we can then think of the school as a source of the social reproduction of class.

In the United States, as well as in many other societies that profess democratic ideals, a core professed societal value and goal is that of opportunity for all regardless of one's background. In the educational system this takes the form of the belief that all students deserve the opportunity to learn and be educated and that all students have a right to access educational opportunities at all levels of the system, from elementary to post-secondary

education. Society professes that this access and opportunity should not be limited by one's racial/ethnic background, socioeconomic status, nor in some instances by one's academic ability.

Counterpoised to this view of the educational system as one of equitable distribution of opportunity regardless of social class is the view of some social theorists and researchers that posits that the educational system serves as a means to perpetuate and legitimize the reproduction of social class and status. The argument contained in this literature is that public schools in industrial societies like the United States "make available different types of educational experience and curriculum knowledge to students in different social classes (Anyon, 1981)." It is through these different experiences and knowledge, determined by a student's social class, that social inequality is reproduced and perpetuated.

Building on the seminal qualitative work of Anyon (1981), this study seeks to offer further insight into the link between schools and schooling and the reproduction of social class by examining a unique dataset of teacher's instructional practices in elementary mathematics classrooms. Specifically, I address the following research questions: 1) to what extent are teachers' instructional practices in elementary classrooms a function of the social class of the population of students enrolled in the school? 2) Is there a relationship between the cognitive complexity of instruction and instructional tasks given to students and the social class of students enrolled in the school?

I begin with a discussion on the theoretical perspectives of social reproduction theorists that underpin the view of schools and schooling as social institutions that legitimize the reproduction of social class and status. Next, I present an overview of prior research that informs the theoretical framework for this study. Then, a discussion the data for this study

and method of analysis will be presented. Finally, I present results and discuss their implications.

Schools and the Social Reproduction of Class

What do we mean when we speak of class reproduction in capitalist society? Karl Marx conceived of it thus in *Capital,* "The capitalist process of production…produces not only commodities, not only surplus-value, but it also produces and reproduces the capitalist relation itself; on the one hand the capitalist, on the other the wage labourer (Marx, 1990)." From this the structure of social classes in capitalist society is a function of the production of capital and further is perpetuated by that production. In this sense then, "reproduction refers to the means whereby the relative position of individuals or families in the class structure is maintained throughout their work lives or from generation to generation (Robinson, 1984)."

A natural question is what are "the means," that is what are the mechanisms whereby social position is reproduced from generation to generation? Undoubtedly, the nature of the "capitalist relation" between the capitalist and the wage labourer and the structuring of society as such is itself is a mechanism of reproduction. Thus, in order for the situation of unequal power and domination of the capitalist over that of the wage labourer to be reproduced, it is necessary for the capitalist to maintain economic stability such that he maintains power over the means of production and the proletariat is held in a state of perpetual sale of their labour power. Bowles and Gintis (1976) note that this stability is wrought through the "coercive power of the state," in the enactment of laws protecting private property and laws governing the ability of workers to collectively act (i.e. right to

work laws in states that disallow unionization in certain professions such as fire fighters and teachers). The extent to which this coercion is effective is very much a product of the inability or unwillingness of the subjugated to oppose the domination to which they are subject. In essence the reproduction of the capitalist relation and concomitantly the social structure underlying it depends on the reproduction of consciousness, of "beliefs, values, self-concepts, types of solidarity and fragmentation, as well as modes of personal behavior and development" (Bowles and Gintis, 1976) of the working class.

Within this structure of relations between capital and labour we must then recognize the "role schools – and the overt and covert knowledge within them – play in reproducing a stratified social order that remains strikingly unequal by class, gender and race (Apple, 1982: 9)." Although professing to be democratic in its attempt to help all children achieve to their highest potential, schools may actually serve to perpetuate and reproduce the larger system of domination and exploitation within which they are embedded. Authors such as Apple, Bernstein, and Bourdieu have "argued that knowledge and skills leading to social power and regard (medical, legal, managerial) are made available to the advantaged social groups but are withheld from the working classes to whom a more 'practical' curriculum is offered (manual skills, clerical knowledge) (Anyon, 1981: 3)." This is to say that the types and tenor of a child's experiences during the length of their schooling as well as the expectations for the child (behavior, personality, adult outcomes) from schools and teachers depends on the social stratum from which the child comes from and from which it is expected that the child will enter after formal schooling concludes. This argument holds that formal schooling serves the purpose of reinforcing and reproducing socioeconomic status of individuals, as well as a means for the transmission of knowledge and social power to individuals based on

their social stratum and to maintain the status quo hierarchy of social stratification. The classic formulation of this is Bowles and Gintis's (1976) *correspondence principal* whereby the "social relationships of education—the relationships between administrators and teachers, teachers and students, students and students, and students and their work—replicate the hierarchical division of labor" where "students in different social-class backgrounds are rewarded for classroom behaviors that correspond to personality traits allegedly rewarded in the different occupational strata—the working classes for docility and obedience, the managerial classes for initiative and personal assertiveness."

Another possible mechanism of the reproduction of social class by schools is the sorting of students into different curricular tracks and ability groups within schools and classrooms based primarily on prior achievement in academic subjects. These different tracks are often categorized by a difference in resources, instructional strategies and expectations for students (e.g. Oakes, 1985; Finley, 1984; Lucas and Berends, 2007). To the extent that prior achievement, and subsequently track or group placement, is related to a student's social class the presence of curricular tracks may serve to not only preserve existing inequalities but may in fact work to widen them (e.g. Oakes, 1985; Gamoran and Mare, 1989). Evidence indicates that students in higher track placements are potentially exposed to more curricular content at a higher level of instructional quality than their peers in lower track or group placements (Gamoran and Carbonaro, 2002; Carbonaro, 2005; Oakes, 1985). Further, tracking and the provision of differential curricula exists not only within schools but may exist between them as well as schools located in more impoverished localities may not possess the resources necessary to provide higher quality curricula and instruction.

Anyon (1981, 2008) provides a picture of how schools may unconsciously reproduce the inequality in society through differential instruction and curricula in her ethnographic study of the "differences in student *work* in classrooms" of five elementary schools located in "contrasting social class communities." She observed markedly different instructional practices and expectations between the schools; in 'working class schools' instruction focused on mechanical and rote tasks and procedures with very little critical thinking expected of students. For example, when asked what knowledge was appropriate for students to learn, teachers in the 'working class schools' responded that "what these children need [are] the basics" and "the 3-Rs." Further teachers rarely used the "thinking pages" of textbooks that called for mathematical reasoning, inference, or pattern identification and rather concentrated on the basic skills of how to multiply and divide. Large portions of children asked to "carry out procedures…seemingly unconnected to thought processes or decision making." In these schools, through curricular choices and instructional practices, students were taught that valued knowledge does not come from within themselves or that they were not producers of knowledge. Rather, knowledge was produced by others, and students were merely to consume and accept that knowledge as appropriate knowledge.

In the "middle class" schools teachers noted that appropriate knowledge was whatever would prepare their students for high school and "possibly college." Here there is a recognition on the part of teachers that in order for their students to be successful, at least at the next highest rung of the educational and occupational ladder, they must have some understanding of things that they read or of the mathematical procedures that they are asked to memorize, but although understanding may be "more important than the skills, although they [skills] are important too." Thus, students are being prepared for work such that they

have some capability to understand the tasks that are set to them and that they will have the skills to carry out those tasks.

In contrast, the “professional school” school personnel referred to appropriate school knowledge as involving either individual discovery and creativity, "important ideas," or personal activity on the part of the student (as in the use of science or math equipment). Teachers made statements such as, "My goal is to have children learn from experience. I want them to think for themselves" and “[I want my students to] Learning to think… [and] not regurgitate facts… but immerse themselves in ideas." In this school mathematical knowledge was about discovery and direct experience. Instructional practices involved the use of hands-on activities and the generating of questions by students for other students to answer. By these instructional practices it was possible for students to be participants in the creation of knowledge, but there were constraints place on that creation of knowledge “to the ‘right’ answers, where right answers are part of a system of manipulating numbers…and work must fit ‘empirical reality.’”

Finally, at the top of the social hierarchy, the “executive elite school” focused on developing the analytical and intellectual powers of its students. To teachers in this school "its not just academics, its learning to think" that was a guiding principal for their instruction of students because “They'll go to the best schools, and we have to prepare them.” In terms of the mathematics curriculum the goal of instruction was the development of the students’ mathematical reasoning. In this way math was taught as a "decision-making process" whereby children could “think and reason correctly and [could] come up with valid conclusions.” Finally, instruction in this school was shaped by “the demands of ‘getting through the curriculum’” in that teachers and administrators felt that in order to prepare their

students for the best schools, then it was necessary to insure that students had exposure to all facets and aspects of the mathematics curriculum and that this left very little time for "exploration."

Thus, Anyon sees the reproduction of social class at work in these schools through their "differing curricular, pedagogical, and pupil evaluation practices [which] emphasize different cognitive and behavioral skills in each social setting and thus contribute to the development in the children of certain potential relationships to physical and symbolic capital, to authority, and to the process of work." This finding leads directly to the purpose and impetus of this paper, are the mechanisms of reproduction of social class through differential instructional practices and curricula found by Anyon in the early 1980s still operative and meaningful in the education of students almost 30 years later?

Data and Sample

During the spring semester of the 2006-2007 school year Surveys of the Enacted Curriculum (SEC) were administered to 786 K-12 mathematics teachers in the state of Indiana across seven school districts. This data collection was a part of an ongoing research program of the National Center on School Choice at Vanderbilt University examining the effects of charter schools on student achievement and school contexts (i.e. parental involvement, teachers' instruction and context of employment, etc.). For purposes of this paper, teachers in charter schools were excluded from the analysis as well as teachers who did not fully complete the survey bringing the total sample of mathematics teachers to 335. The SEC (described in more detail below) allows me to look at the research questions posed

in this paper in that it collects a wealth of information on teachers' instructional practices in mathematics from a number of different socioeconomic contexts.

Measuring teachers' instructional practices

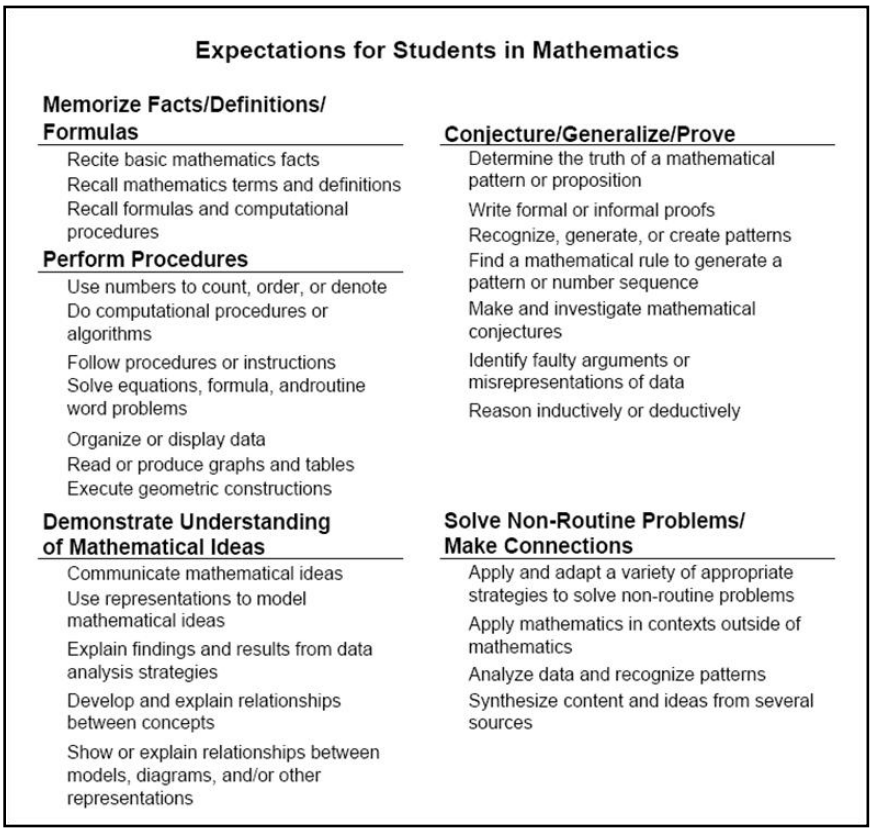
Porter (2002) and colleagues research over the past 25 years has examined teachers' content decision making, resulting in the development of tools for measuring content and alignment, including: (1) surveys of teachers on the content of their instruction (Surveys of the Enacted Curriculum [SEC]), and (2) content analyses of instructional materials. A major focus behind these tools is the development of common languages of topics and categories of cognitive demand for describing content in different subject areas (e.g., mathematics, reading, and science).

The surveys asks the teacher to choose a target class that she has taught for the entire school year and then asks a number of questions about that target class, such as how the class is organized, the description of the class, grade level, number of students, percentage female, percentage minority, the length of class, how many weeks it meets during the year, percentage LEP, achievement level, and what is considered in scheduling students into the class (questions 1-13 on the surveys; see http://www.seconline.org). Specifically, the survey asks teachers to report on the achievement level of the target class. Teachers can respond with "high achievement levels," "average achievement levels," "low achievement levels," and "mixed achievement levels." This indicator has been used in national surveys and analyzed by several researchers interested in ability grouping and tracking (see Argys, Rees, and Brewer, 1996; Gamoran, 1989; Gamoran and Berends, 1987; Oakes, Gamoran, and Page, 1992).

The *Survey of Instructional Content* portion of the SEC measures the content of instruction by requesting of teachers information regarding topic coverage and their expectations for students in the target mathematics class for the most recent school year. Teachers are presented with a content matrix that contains lists of discrete topics associated with mathematics instruction. These topics are arranged around 16 content areas ranging from number sense, properties and relationships to instructional technology. Teachers are first asked review the entire list of content topic areas and then to indicate any content areas or topics that are not covered in their class. Next teachers are asked to rate the amount of time spent on each topic covered in their class as either: *slight* (less than one class/lesson), *moderate* (one to five classes/lessons), or *sustained* (more than five classes/lessons).

Besides indicating the amount of time spent on each topic area, teachers are also asked to provide information about the relative amount of instructional time spent on work designed to help students reach certain expectations in mathematics (ranging from 0 = no emphasis to 3 = sustained emphasis accounting for more than 33% of the time spent on this topic) within each topic. There are five categories cognitive demand within which teachers rate the relative emphasis of their instruction and expectations: 1) *memorize*; 2) *perform procedures*; 3) *communicate understanding*; 4) *solve nonroutine problems*; and 5*) conjecture/generalize/prove*. Figure 4 provides more detail of each of these categories of cognitive demand. Teachers are cautioned that should typically be given for only one and no more than two expectation categories within any given topic.

Figure 4: Instructional expectations measured by the SEC for mathematics†



†Figure Reproduced from SEC K-12 Mathematics Survey: http://seconline.wceruw.org/Reference/K12mthSurvey.pdf

Taken together, the two dimensions of content topics and cognitive demand can be thought of as a two dimensional language for describing content (e.g. Porter, 2002; Porter, et al., 2007)," whereby the intersection between each topic and cognitive demand can be reduced to a proportion that when summed over rows and columns equals 1.0 (see Figure 5). What is being measured is not just time spent on mathematics instruction, but "within that time, the relative emphasis of particular types of content represented by the intersection of topics and categories of cognitive demand (Porter et al., 2007)."

Figure 5: Content matrix of topic coverage and cognitive demand.

Topic	Category of cognitive demand				
	Memorize	Perform procedures	Communicate understanding	Solve nonroutine problems	Conjecture/ generalize/prove
Multiple-step equations					
Inequalities					
Linear equations					
Lines/slope and intercept					
Operations on polynomials					
Quadratic equations					

† Figure reproduced from Porter, 2002

Outcome Measures

Topics Covered

From the responses described above it is possible to create two variables that capture the topical coverage for each teacher. ***Number of Topics*** is the total number of mathematics topics that the teacher has indicated that they have covered in their target classroom over the most recent school year. For this sample of teachers this variable ranged from a minimum value of 8 to a maximum value of 214. ***Breadth of Topic Coverage*** is the percentage of the total possible topics that could be covered by a teacher that is actually covered by the teacher that ranges from zero to 1. For example, if there were 300 possible topics and a given teacher covered 225 of them, then the value of her breadth of topic coverage would be 0.75

Cognitive Demand

From this extensive amount of information on teachers' topic coverage and the cognitive demand of instruction and expectations on their students we are able to construct five variables that capture the relative amount of instruction for each teacher that falls into

each cognitive demand category. The value for each of these variables (*Memorize*, *Perform Procedures, Communicate Understanding, Solve Nonroutine Problems* and *Conjecture/Generalize/Prove*) lies between 0.0 and 1.0. For example, a value of 0.50 for the "memorize" cognitive demand variable would indicate that 50% of the teacher's instruction is on tasks and topics that emphasize memorization.

Operationalization of Class as Socioeconomic Status

It is widely recognized that the concept of class is a concept that is not easily or clearly operationalized such that the distinctions between classes can be quantified. Class is not merely derived from certain levels of income or education nor is it necessarily derived from the occupation or job which one holds. Class is also a lived reality and is defined in large part by the relationships one holds with others and the relative position one has in the social structure vis-à-vis others in that hierarchy (e.g. Wright, 1985; 1997). This does not mean though that quantification of class does not hold any empirical relevance or power in investigating questions of class and society. Anyon herself uses the educational, occupational and income levels of the schools in her study to classify and place them within a social hierarchy of class. Following from this I have classified schools in this data along the same lines of income, education and occupation such that they would resemble Anyon's classification and better allow for a temporal comparison of her findings (see Table 1 for a comparison of class operationalizations). Below I describe the method used in deriving class in this sample of schools and teachers.

For each school in the data set its street address was geocoded in order to retrieve its census tract as defined by the United States Census (2000).[17] This process was undertaken through a web application hosted by the Federal Financial Institutions Examination Council (FFIEC) Geocoding System,[18] which maintains information and data on selected economic, demographic and housing characteristics of census tracts. From this data source I was able to obtain the relative (discussed below) and actual income levels for each census tract and the percentage of persons living below the poverty line. Information on the occupational and educational characteristics of the census tracts in the data was obtained from Forms 1 and 3 of the US Census 2000. These three pieces of information on each tract was then used to determine its class location.

A measure of the income level of individual census tracts was obtained from census data. First a "Tract Median family Income Percentage" was calculated. This percentage compares "the tract level Median Family Income (MFI) to the metropolitan statistical area or metropolitan division (MSA)/MD level MFI. It is calculated by dividing the 2000 Tract MFI by the 2005 MSA/MD MFI. (For tracts located outside of an MSA/MD, the MFI used in the denominator is the statewide non-MSA/MD MFI. This figure is calculated using incomes from all areas of a state that are not assigned to MSA/MDs).(FFEIC, 2007)" Based on the tract MFI percentage individual tracts were classified into one of 4 levels: 1) *Low*—the tract MFI percentage is less than 50%, 2) *Moderate*— tract MFI percentage is greater or equal to 50% but less than 80%, 3) *Middle*-- tract MFI percentage is greater or equal to 80% but less than 120%, 4) *Upper*-- tract MFI percentage is greater than or equal to 120%.

[17] Geocoding is the process of ascribing latitude and longitude coordinates to a street address which can then be matched to the latitudinal and longitudinal boundaries of census tracts.
[18] http://www.ffiec.gov/geocode/help1.aspx

Following a similar methodology to that described above for *tract income level*, a classification of the educational and occupational level of the tract was obtained. When looking at education an important distinction is "under educated" which could be operationalized as those tracts which have a high percentage of residents that have not completed high school and have not earned some type of high school diploma. From the census 2000 the percentage of the population 25 years and over who had not obtained a high school degree was obtained. This percentage was compared to the statewide average percentage of population 25 years and over who had not obtained a high school degree in the same manner as above such that tracts were classified on a scale of 1 to 4 with 1 indicating that a tract had a population without a high school diploma that was greater or equal to a 120% of the statewide average and with 4 indicating that a tract had less than 50% of the statewide average of non-high school diploma holders.

Tract occupation level was derived by taking the percentage of the civilian employed population 16 years and over that was employed in the occupational categories of “management” or “professional” as defined by the US Census. Again this percentage was compared to the statewide average within those two categories, and each tract was assigned a position from 1 to 4 with 1 indicating that less than 50% of the population was employed in management or professional occupations and 4 indicating that over 120% of the population was employed in those occupational categories.

These three scores were then weighted equally and the average of the three scores was taken to determine a final ranking of tracts on a scale of one to three with higher socioeconomic status tracts receiving higher average values. From this score, tracts were divided into three class designations based on Anyon’s classification scheme; working class,

middle class, and professional class.[19] A descriptive analysis of tracts revealed that none of the tracts could be conceptually categorized as 'executive elite' based on their incomes and occupational structures.

Table 10 presents a descriptive comparison between Anyon's sample and this data in terms of income, occupation and racial/ethnic composition. Table 11 presents full income, education and occupational descriptive statistics for each tract class and for the state of Indiana. From these comparisons it can be seen that class as operationalized in both studies closely resemble one another.

Teacher Characteristics Measures

Temporary certificate is an indicator variable that takes on the value of 1 if the teacher indicated that she held a state certification that was either "emergency, provisional or temporary," and took the value of 0 for any other type of state certification (i.e. elementary/early childhood, middle school, secondary mathematics, etc). An indicator variable, *minority teacher*, was created that took on the value of 1 if the teacher indicated their race/ethnicity other than "White" and took the value of zero if the teacher indicated their race/ethnicity as "White." Teachers were asked to indicate their level of experience as both the number of *years teaching mathematics* and the number of *years assigned to teach in current school* in one of 7 categories (less than 1 year, 1-2 years, 3-5 years, 6-8 years, 9-11 years, 12-15 years, More than 15 years). Finally teachers were asked to indicate their highest attained post-secondary degree in one of 6 categories; Does not apply, BA or BS, MA or MS, Multiple MA or MS, Ph.D. or Ed.D and Other. This variable was collapsed into a single

[19] Tract scores were round up to the next whole number so that each tract's score was 1, 2, or 3.

dummy variable indicating if a teacher's highest degree was a *Master's degree or higher* (0 = less than a MA or MS, 1 = MA or MS and higher).

Table 10: Comparison of Anyon's Classification of Schools into Classes and Operationalization of those Classes for this Sample

		Father's occupations	Family Incomes	School Racial Composition
Working Class	***Anyon***	Mixture of unskilled or semiskilled occupations	at or below $12,000 (38.6% of US families in 1979)	≈ 85% White
	Sample	35% Construction, Production 48% Sales and Service 17% Professional and Management	$19,000 to $46,000 (≈ 30% of US housholds in 2006)	52% White
Middle Class	***Anyon***	Mixture of highly skilled, well-paid blue and white collar workers (i.e. teachers, social workers, accountants and middle managers)	$13,000 to $20,000 (38.9% of US families in 1979)	≈ 85% White
	Sample	34% Construction, Production 40% Sales and Service 26% Professional and Management	$46,000 to $67,000 (≈ 15% of US housholds in 2006)	87% White
Affluent Professional	***Anyon***	"Affluent Professionals" including highly-paid doctors, television or advertising executives, interior designers	$40,000 to $80,000 (7% of US families in 1979)	≈ 90% White
	Sample	15% Construction, Production 37% Sales and Service 48% Professional and Management	$68,000 to $102,000 (≈ 15% of US housholds in 2006)	86% White
Executive Elite	***Anyon***	Vice presidents or more advanced corporate executives	greater than $100,000 (less than 1% of US families in 1979)	100% White
	Sample	na	na	na

Table 11: Tract Level Descriptive Statistics by "Anyon Classification" of Sample Tracts Compared to Indiana

"Anyon" Classification		Working Class	Middle Class	Professional Class	State
Educational attainment of population 25 years and over	Pct. Graduate or Professional Degree	0.03 (0.02)	0.06 (0.05)	0.15 (0.05)	0.08
	Pct. Bachelor's Degree	0.06 (0.03)	0.10 (0.05)	0.27 (0.09)	0.14
	Pct. Associate Degree	0.05 (0.02)	0.05 (0.01)	0.07 (0.02)	0.07
	Pct. Some College, No Degree	0.21 (0.04)	0.19 (0.04)	0.21 (0.04)	0.19
	Pct. High School Graduate (inc. equivalency)	0.37 (0.06)	0.40 (0.09)	0.22 (0.08)	0.37
	Pct. No High School Degree	0.28 (0.09)	0.19 (0.07)	0.08 (0.03)	0.15
Occupational category of civilian employed population 16 years and over	Pct. Management	0.06 (0.03)	0.10 (0.03)	0.20 (0.05)	0.12
	Pct. Professional	0.11 (0.04)	0.16 (0.05)	0.28 (0.06)	0.18
	Pct. Service	0.20 (0.04)	0.15 (0.03)	0.10 (0.02)	0.15
	Pct. Sales and Office	0.28 (0.05)	0.25 (0.05)	0.27 (0.05)	0.24
	Pct. Farming, Fishing, Forestry	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00
	Pct. Construction, Extraction, and Maintenance	0.10 (0.03)	0.10 (0.03)	0.06 (0.02)	0.10
	Pct. Production, Transportation, and Material Moving	0.25 (0.04)	0.24 (0.09)	0.09 (0.04)	0.20
Poverty and Income	Pct. Residents Below Poverty Line	0.21 (0.10)	0.08 (0.04)	0.05 (0.03)	0.09
	Median Family Income	$38,687.89 ($6,118.86)	$56,163.05 ($6,178.32)	$80,908.00 ($12,560.54)	$ 55,781.00
Race alone or in combination with one or more other races total population	Pct Hispanic Residents	0.16 (0.14)	0.05 (0.07)	0.02 (0.01)	0.05
	Pct. Black Residents	0.28 (0.22)	0.05 (0.06)	0.08 (0.06)	0.09
	Pct. White Residents	0.52 (0.20)	0.87 (0.11)	0.86 (0.07)	0.87
	Pct. Minority Residents	0.48 (0.20)	0.13 (0.11)	0.14 (0.07)	0.13
	N (census tracts)	18	21	7	

Classroom Context Measures

Teachers were asked to indicate their target *class size* within six categories ranging from "10 or fewer" to "31 or more." Due to infrequency of response, these categories were collapsed into 3 final categories that were used in the analysis ("15 or less", "16-25", and "26 or more"). Teachers were also asked to indicate the *percentage of females*, *percentage of English Language Learners* (ELL) and *percentage of minority students* enrolled in their target classroom, rounded to the nearest 10% (10 categories, 0=less than 10% - 9 = 90+%). After checks of response frequencies the percentage of minority students and the percentage of female students' variables were recoded to reflect 3 categories (20% or less, 20%-70%, more than 70%). The percentage of ELL students was recoded into 2 categories that reflect the nature of classrooms to either have a large number of ELL students or very few (10% or less, 11-30%). As a final measure of the classroom context teachers were asked to rate the *achievement level* of most of the students in the target class, compared to national norms, as either "high achievement levels", "average achievement levels", "low achievement levels", or "mixed achievement levels."

Analytic Methods

In order to investigate my research questions of interest I propose the following ordinary least squares (OLS) model:

$$IP_i = \beta_0 + S\beta_q + X_i\beta_q + C_i\beta_q + G_i\beta_q + D_k\beta_q + \varepsilon_{ijk}$$

Where the Instructional Practice of teacher *i*, in school *j*, located in census tract *k.* are modeled as a function of:

$\boldsymbol{X_i}$ = a vector of teacher characteristics that may influence their instructional practices; number of years teaching mathematics, the number of years teaching at current school, teacher possession of a temporary certification, the teacher's undergraduate degree was in mathematics and teacher possession of a graduate degree.

$\boldsymbol{C_i}$ = a vector of teacher classroom characteristics that may influence their instructional practices; percentage of minority students, percentage of female students, the percentage of English language learners, and the teacher's categorization of the achievement level of her class.

$\boldsymbol{G_i}$ = a vector of grade level indicator variables (dummy coded for grades 1-12, Kindergarten omitted) for the grade level taught by teacher *i* that account for any systematic differences in instructional practices that vary by grade level (i.e. the grade is an NCLB tested grade).

$\boldsymbol{D_k}$ = a vector of dummy variables for the school district within which school *j* is embedded that accounts for any systematic influences from the school district on teachers' instructional practices.

All models are estimated with robust standard errors accounting for the nesting of teachers in census tracts.

Results

Table 12 presents results from the analysis of the effect of class operationalized in terms of the Anyon classification, on teachers' instructional practices in terms of the

mathematics topics covered (panel 1) and the cognitive demand of tasks given to students related to those topics (panel 2). The column *Intercept* represents the excluded category of middle class and represents the baseline for comparison.

In terms of topics covered we see substantial and statistically significant differences between the three classes. Teachers in professional class tracts on average cover approximately 34 more mathematics topics in a year ($B = 33.630$, $p > 0.01$) than their middle class peers who cover approximately 64 topics per year. Further we see that the estimate on working class teachers is also statistically significant and indicates that on average teachers in working class tracts cover approximately 9 fewer topics per year ($B = -9.061$, $p > 0.10$) than their middle class tract peers or about 55 topics per year.

For breadth of instruction, on average middle class tract teachers covered approximately 30% of possible mathematics topics in their classrooms during the school year. Working class tract teachers cover approximately 4% fewer topics than the middle class tract teachers ($B = -0.042$, $p>.10$) or about 26% of possible mathematics topics. In contrast, professional class tract teachers cover 16% more topics than the middle class tract teachers ($B = 0.156$, $p > 0.01$) or about 46% of all possible topics.

Table 12: Estimates of the Effect of Tract Class on Teachers' Instructional Practices in Mathematics

Dependent Variable		Working Class			Professional Class			Intercept			R-Squared	N
Topics Covered	Total Number	-9.061	*	4.961	33.630	***	6.919	63.972	***	12.440	0.741	335
	Breadth	-0.042	*	0.023	0.156	***	0.032	0.298	***	0.058	0.741	335
Cognitive Demand	Memorize	0.003		0.012	-0.039	**	0.017	0.259	***	0.030	0.229	335
	Perform Procedures	0.000		0.013	0.021		0.018	0.358	***	0.032	0.190	335
	Demonstrate Understanding	-0.012		0.010	0.003		0.014	0.230	***	0.026	0.141	335
	Conjecture	0.005		0.009	0.000		0.012	0.080	***	0.022	0.149	335
	Solve Non-Routine Problems	0.001		0.010	-0.010		0.014	0.080	***	0.025	0.163	335

†All models presented include teacher characteristics, classroom characteristics, grade level fixed effects and district fixed effects.

Table 12 also presents the estimated effect of tract class on teachers' report of the cognitive complexity of their tasks assigned to students. With the exception of percentage of tasks that utilize memorization, teachers across all three classes of tract were statistically indistinguishable in the cognitive complexity of their tasks and expectations for student learning. In the only statistically significant estimate, professional class tract teachers use tasks that utilize memorization approximately 4% less than their middle and working class tract peers ($B = 0.039$, $p > 0.05$).

Discussion and Limitations

Several caveats and limitations must be kept in mind when one considers the findings of this study. First, the generalizability of this sample is limited to a degree and one should exercise caution in taking these findings and ascribing them to other contexts. This sample is from a limited number of districts and census tracts in one state, which although they may

represent a cross section of that state may or may not be wholly representative of other contexts in other states or localities. Secondly, class as operationalized in this data is at the tract level which may not represent or fully capture the effect of class at the student or school level. However the fact that significant effects of class on teachers' instructional practices were still estimated, even at the tract level, are quite suggestive of different instruction based on class. Finally, one must also consider that the operationalization of class in this sample of teachers and tracts is truncated at both the lower and upper end. Very few tracts had median family incomes below the Department of Health and Human Services poverty threshold of $21,000 for a four person household and concomitantly no tracts had median family incomes representative of the most affluent segments of American society (i.e., incomes over $100,000). We might suspect that if we were able to compare the instructional practices of teachers between the extreme ends of the continuum of socioeconomic status that differences between those practices and expectations would be more pronounced than found in this sample.

Despite the above caveats, the story in this analysis conforms to some degree to the curricular differences evidenced by Jean Anyon in her qualitative study of class and school knowledge in five elementary schools in New Jersey in 1979. It still appears to be the case, almost 30 years later, that there are differences in the classroom instruction, at least in mathematics in this sample, that students experience as provided by their teachers that is in some way correlated with the social class that can be ascribed to them by the census tract in which their school is located.

The most striking class differences found were in terms of the topical coverage of mathematics by teachers over the course of the school year. Working class tract students

were exposed to substantially fewer topics than both their middle and professional class tract peers, with the most striking difference in topic coverage being that professional class tract students were exposed to almost 50% more mathematics topics than their middle class peers. Concomitant with this is the fact that the professional class tract teachers went into significantly more breadth of topic coverage than teachers in working class or middle class schools. Combined these findings paint a picture of the professional class tract teacher covering not only more topics in a gross sense, but also covering more of the possible mathematics topics (breadth). In comparison, the working class students appear to spend more class time on a significantly fewer number of topics and are exposed to fewer possible mathematics topics over the course of the year.

This picture, of quite different instruction by class, is consistent with the differences found by Anyon in 1979. Teachers in the working class schools in Anyon's sample professed that their children needed instruction in the "basics" and that their instruction focused on the "3 Rs." One way in which teachers can focus on the basics is by only covering those topics and in effect narrows the curriculum to only those topics. Although my data do not provide illumination into whether these teachers only cover the basics, they are quite suggestive of a systematic narrowing of the curriculum (at least in terms of total topics covered) in working class schools regardless of the grade level in which the teacher is teaching or of the teacher's own assessment of the achievement level of her students. These data and findings paint an entirely different picture of the instruction found within professional class tract classrooms that is similar in tenor to that found by Anyon. For example, a teacher in Anyon's executive school notes that the demands of "getting through the curriculum do not leave time to have children 'explore'." This is congruent with the

picture of a professional tract teacher who covers substantially more topics per year, that in turn are a larger portion of possible topics, with substantially less emphasis.

From Anyon's findings of differences between classes of schools and their expectations for students and what 'counts' as school knowledge we would expect to also find differences by class in terms of cognitive demand of tasks and expectations of teachers of mathematics for their students. In fact this was not clearly the case in this sample as there was a striking similarity across classes in the cognitive demand placed on student work. In fact the only significant difference between classes was that professional class teachers used approximately 4% less instructional time on tasks that involve memorization than their working or middle class peers. A lot of the power of Anyon's study came from the stark differences between schools and the type of curricula that their students were exposed to from the "basics" and "3 Rs" of the working class to fostering individual creativity in the affluent professional class school to focusing on development of mathematical reasoning in the executive elite school.

How do we explain the similarity in cognitive demand of instructional tasks across working, middle and professional class tract classrooms? One possible explanation for this may be that with the advent of standards based reforms in the 1980s and especially with the passage of the No Child Left Behind Act in 2001, all schools and teachers, regardless of "class" are pressured to teach in alignment to state curriculum standards and further are under pressure to increase student performance on standardized tests in mathematics. These pressures may be leading teachers in all types of schools to be using similar strategies of instruction that they believe will lead to better test preparation and performance. As others have noted, this often leads teachers to cut out instructional strategies that foster deeper

thinking and understanding and instead focus on instructional strategies that are more drill, repetition and rote memorization.

This study has shown that it may still be the case that teachers provide differential learning environments and expectations for their students related to the social class environment within which their school is located at least in terms of the amount and breadth to which they teach mathematics topics and concepts. Although we cannot see the interactions between students and teachers in these data, we might suspect that students in these schools, by receiving differential amounts of the mathematics curriculum in relation to their social class are being exposed to qualitatively different educational environments in their mathematics classrooms. In the absence of a more detailed investigation of the lived experience within these classrooms and the interactions that go on in them we should be wary to call this evidence of social reproduction through teachers' instructional practices, but it is at least suggestive of it. In terms of cognitive demand of instructional tasks, where we would expect to see large differentials by class, we in fact did not. This paints an opposite picture of standardization of instruction and expectations across class lines such that students of all classes in this sample appear to be receiving similar instruction. In future research it would be productive to combine an instrument such as the SEC and its wealth of information on teachers' instructional practices with in-depth observation and study of those classrooms to tease out if schools and schooling act as mechanisms, long suspected, of the social reproduction of class in western society.

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CHAPTER V

CONCLUSIONS

We have seen in this dissertation that racial-ethnic and socioeconomic groupings of students are salient factors in the contemporary educational policy issues of seasonal learning inequalities, the effect of charter schools on sorting of students and in the instructional content coverage and teachers' expectations of instruction across social status. Briefly in what follows I will review what I believe to be the salient findings from each of the studies, give my impressions of how those findings fit with the extant literatures and finally propose the next steps in further research in each area.

Chapter II, Neighborhood and School Effects on Seasonal Inequalities in Student Academic Achievement strikes a middle ground between the two main streams of seasonal research; studies within single urban school districts and studies with nationally representative data. The District in the study represents an urban school district that is much more diverse in terms of the racial-ethnic mix of students enrolled in the district and in the range of socioeconomic status of schools and neighborhoods found within the district. As such, the choice of the one district as the frame of study resembles the work of Heyns in Atlanta and Alexander and Entwisle in Baltimore yet also address some of the concern of later researchers that the localities in those studies might not be diverse enough in terms of race-ethnicity and socioeconomic status, and as such may provide conservative or underestimates of the effect of summer time on student achievement. The contribution of the studies that used nationally representative data to the literature on seasonal learning comes

from their use of analytic methodologies that improve upon those of early studies by accounting for the confounding effect of lag time between the beginning and ending of the school year and the timing of testing. This study sits in the middle ground of these two streams of scholarship by utilizing the improved methodologies of the nationally representative studies within the a specific urban locality, allowing for a greater explication and investigation of the school and neighborhood contexts within which students reside and learn.

I see several directions in seasonal research which I feel more research is needed. Although seasonal researchers all generally agree that the summer time away from school is deleterious for the learning and achievement of disadvantaged students, we do not know, at least to my mind or satisfaction, the specific mechanisms or characteristics of disadvantaged neighborhoods that lead to summer learning loss. I would propose that a mixed methodology investigation of a specific school district and its concomitant schools and neighborhoods would do much to further our understanding of the lived environments of students that have been found to be detrimental to student learning during the summer. By having a fuller understanding of these environments policy makers can be better informed in the creation of policies and programs designed to ameliorate summer learning loss. Secondly, it will be necessary to investigate the effect of summer time on highly mobile students as one would expect the combination of summer and changing of schools and neighborhoods to be especially detrimental to those students. Currently I am looking at a newer use of cross classified hierarchical models that may allow for the inclusion of mobile students in an investigation of seasonal learning loss. Finally there is also a need to investigate the effect of

summer time on older students' learning and achievement as the extant literature has mainly focused on the elementary years with no studies of high school.

In Chapter III, Who Chooses and Why? Charter School Choice Patterns among Indianapolis Parents, looks at the reasons that parents potential hold for choosing to enroll their children in a charter school by comparing their stated reasons with their actual choices. This is a vein of charter school research that has not received as much study in the past as has the investigation of the effect of charter schools on student achievement. Research on charter schools on achievement has failed to come to a clear conclusion on the positive or negative effect of charters on achievement due in large part to methodological difficulties related to the confounding of achievement with potential selection effects of students into charters. Although I feel that achievement studies of charter schools are important to our understanding of the sector I would propose that it might be more important for us to understand the social consequences of charter schools on the racial-ethnic sorting of students. Charter schools as an option to traditional public schools are most likely to be a permanent part of the American educational system regardless if they are no worse or better than traditional public schools in terms of their effect on raising student achievement (one need only to look at the continued growth in the sector and the apparent favorable view of charter schools by the United States Secretary of Education and President to see the plausibility and validity of this statement). Given this I believe that research on charter schools should look more toward understanding the consequences of choice on racial-ethnic and socioeconomic sorting of students to schools and also to the mechanisms whereby parents make those choices for their children before investigating the effects of those schools on student achievement.

In Chapter III, Educational Reproduction: Socioeconomic Status and Teachers' Instructional Practice in Mathematics, looks at the potential role that social class as proxied by socioeconomic status plays in the differential provision of classroom instruction by teachers of mathematics. Given my caveats about the generalizability of the study sample to a wider population of teachers, students and schools, the findings indicate that although there appears to be very little differentiation in the cognitive complexity of teachers instructional expectations by social class there are differences by social class in the amount and breadth of topics covered in the mathematics curriculum by teachers in the sample. This finding mirrors to some degree the findings of the handful of empirical investigations to date on class and teachers' instruction and the theoretical underpinnings of those studies and findings. Although this study does not speak to the quality of the instruction provided to students within schools of differing social class in this sample it does raise this as an important question to investigate in future research. The lack of finding a significant difference in the cognitive complexity of instruction provided to students of different social classes may point to a standardization of instruction perhaps due in part to the pressure felt by teachers and schools, serving students of all social class, to avoid sanctions under the No Child Left Behind Act for poor student performance on state achievement tests. In future research I hope to look at these questions using a broader sample of schools across different sectors of the educational system (i.e., traditional public, charter, magnet and private schools).

In 2001 Adam Gamoran optimistically predicted that within the twenty-first century the U.S. educational system may see a decline in racial-ethnic inequalities in educational outcomes or at the very least no change in those inequalities. Although I agree to some extent that the unpalitability of racial-ethnic inequalities in American society will continue to

exert pressure to ameliorate those inequalities, some of the findings here provide a less optimistic picture for the future. Specifically, the finding that even after accounting for individual, school and neighborhood socioeconomic status, there still remained in the District an achievement gap between African American and white students in mathematics and reading is most troubling. If students of minority groups derive less benefit in terms of achievement from the same schools and schooling as their majority peers then the prognosis for closing the achievement gap remains pessimistic until we better understand why the phenomenon exists and create effective programs and policy to ameliorate the inequality. Secondly, the finding that parents may choose charter schools based on a preference for schools that serve large proportions of students of the same race-ethnicity is a phenomenon that will need continued investigation. Many would agree that the desegregation of American schools coincided with increase in the educational outcomes of minority children with respect to their majority peers. However, the US has seen in recent court action the dismantling of systematic desegregation plans based on race-ethnicity and a return to neighborhood schools. In this landscape it will be of importance to understand if charter schools specifically and school choice more generally are leading towards more self segregation by race-ethnicity in American public schools and what the consequences of this apparent resegregation are on student educational outcomes.

Finally, I agree with Gamoran that socioeconomic inequality will continue to predominate differential educational outcomes for American students and schools. This is most clearly seen in the studies presented here in the finding that the socioeconomic context of neighborhoods appears to be a stronger determinate of out-of-school learning during the summer than race-ethnicity. These inequalities in neighborhoods and the opportunities and

benefits that they confer on students that reside in them contribute to the observed gaps in achievement between racial-ethnic and socioeconomic groups. Schools do appear to ameliorate these disadvantages to some degree when school is in session as the achievement growth of disadvantaged students is higher than their more advantaged peers however as these students progress through formal schooling they continue to fall behind due to losses in the summer. Racial-ethnic and socioeconomic inequalities are multifaceted in their effects on student educational outcomes and will remain an important area of future research for myself and other researchers.