

WORKING P A P E R

Evaluating the Performance of Philadelphia's Charter Schools

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Summary

For many years, poor student outcomes have plagued the Philadelphia school district. A number of reforms have been implemented within the district to improve the district's performance, including the use of charter schools. Charter schools are publicly funded schools that operate autonomously, outside the direct control of local school districts, and generally enroll students through the choices of their parents rather than through residential assignment.

These schools have proven to be popular both in Philadelphia and nationwide. The number of such schools in Philadelphia has risen from four in the 1997-1998 school year to more than 60 today, serving over 30,000 students. But this growth has not occurred without a highly charged debate. Critics in Philadelphia, as in other parts of the country, charge that charter schools siphon off the best students from the traditional public schools, divert badly needed resources from the school district, and foster racial enclaves within a district. An equally fervid group of supporters defends the charter schools, claiming that they not only improve the performance of their students but also that the competitive pressures charters generate cause the traditional public schools to improve.

In this report, we present findings related to some, but not all of these issues. We examine the effects of charter schools on reading and mathematics achievement for students who attend charter schools in the School District of Philadelphia.¹ The report also examines several other important questions about charter schools, including: What are the effects of years of operation, grades served, mission, and demographics of charter schools on student achievement? What types of students do charter schools attract? Do charter schools have higher student turnover rates than traditional public schools? Does the existence of charter schools have an impact on student achievement in traditional public schools?

To answer these questions, a RAND-led team of researchers collected a longitudinal database from the Philadelphia school district for school years 2000-01

¹ Later this year, we will be producing a report on charter schools nationwide, of which this study of Philadelphia is one component.

through 2006-07. This database enabled researchers to track student movement between schools and provides student-level information of race/ethnicity, grade, and test scores in math and reading.

Who goes to the charter schools?

Charter schools are attracting students whose prior achievement levels (when they were in traditional district schools) are slightly below the district-wide average, but higher than the average achievement levels of the traditional public schools they left. Students are transferring to charter schools with a slightly larger population of their own race/ethnicity than the traditional public schools from which they come.

How do the charter schools perform?

Using a within-student analysis known as a fixed-effect model, we examine whether students who switch between traditional public schools and charter schools have stronger math and reading gains in charter schools. The analysis indicates that students' average gains attending charter schools are statistically indistinguishable from the gains they experience while at traditional public schools.

Does the type of charter school matter?

The performance of Philadelphia's charter schools as measured by student achievement gains does not appear to be related to how long the charter school has been operating. However, attending a charter school in grades 9-12 shows a small positive effect on student achievement while attending a charter school in elementary and middle grades shows a small negative effect.

Do charter schools cause traditional schools to perform better?

We find no evidence that the district schools located in neighborhoods with the greatest charter competition are performing any better or any worse as a result of the competition. It is possible that charter schools could be exerting a district-wide effect, but district-wide effects could not be examined in this study.

Do charter schools have more student turnover than traditional schools?

Charter schools and traditional schools have similar percentages of students who change schools from year to year.

How should this report be viewed?

This study offers findings about charter schools in Philadelphia that can contribute to debate surrounding charter schools. However, our research is by no means a comprehensive evaluation of charter schools in Philadelphia. In addition to our analysis of charter schools' effects on test scores, student sorting and mobility, we advise that policymakers and citizens take into account other factors in assessing the value of charter schools for the city. These might include student attendance, graduation, college attendance, and disciplinary rates as well as program and course offerings, and cost effectiveness.

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Introduction

Like many cities across the country, Philadelphia has seen a substantial growth in charter schools over the last decade. Charter schools are publicly funded schools that operate autonomously, outside the direct control of local school districts, and generally enroll students through the choices of their parents rather than through residential assignment. The first U.S. charter school opened in 1992 and the charter movement has grown to over 4,000 schools serving over a million students in 40 states plus the District of Columbia (Center for Education Reform, 2007). The first charter schools appeared upon Philadelphia's landscape in the 1997-98 school year, and now more than 30,000 students attend over 60 charter schools in the city.²

The growth of charter schools has not been without a contentious debate. Charter school advocates hope that these schools will be able to cut through red tape, offer innovative educational programs, improve student achievement, provide new options to families, and promote healthy competition for traditional public schools (TPS) (Finn et al., 2000). Opponents argue that charter schools are no more effective than TPSs, that they may exacerbate racial segregation, that they create fiscal strains for school districts, and that too many of them serve their students poorly (Wells et al., 1998). The stakes over this debate have increased as increasing numbers of TPSs fall subject to No Child Left Behind's most aggressive interventions, which include conversion to charter status among the sanctions that states may apply to chronically failing public schools.

In this report, we examine the effect charter schools are having on student achievement in Philadelphia. Charter schools, as well as district as whole, have exhibited an increase in the percent of students reaching proficiency in recent years.³ The percent of charter students reaching proficiency in reading and math increased from 24.1 and 16.0 percent to 46.7 and 45.0 percent between 2001-02 and 2006-07 school years.

² In addition, there are approximately 1,900 students attending so called cyber charter schools, which use distance learning and other alternative modes of educating students. While the students are located within Philadelphia school district, they can attend a cyber charter school throughout the state (Philadelphia Daily News, January 23, 2008, available at: http://www.philly.com/dailynews/opinion/20080123_SON_OF_SCHOOL_BUDGET_DEFICIT.html).

³ Please see power point presentation created by the Philadelphia School District at http://www.phila.k12.pa.us/announcements/2007_Results_Presentation.pdf

Similarly, the district as whole increased percent reaching proficiency from 23.9 and 19.5 percent in to 40.6 and 44.9 percent between the 2001-02 and 2006-07 school year.

However, it is not known whether the improvement in proficiency in charter schools is a function of the students charter schools attract or the impact charter schools are having on students. In addition, research has shown that accountability systems that rely upon cut points such as proficiency can lead to schools improving test scores near proficiency but have little effect on other parts of the distribution, including low-performing disadvantaged students (Neal and Whitmore-Schanzenbach, 2007). Other school-level outcomes, such as comparison's of schools making No Child Left Behind's requirement of adequate yearly progress (AYP) can be even more problematic as it not only does not determine whether a school's ability to make AYP is a result of gains in student achievement or the type of students schools attract, but the number of AYP subgroup categories schools need to meet can vary across schools (Kane and Staiger, 2003). This can be particular problematic in trying to compare the performance of charter schools to TPSs. Charter schools are generally smaller and less likely to have as many subgroup categories as TPSs, which would increase the odds of charter schools making AYP relative to TPSs.⁴

Therefore, it is important to evaluate charter schools using data that can track the performance of students over time. In this study, we use longitudinally-linked student level data provided by the district to evaluate the *achievement gains* of charter students. In addition, we complement the achievement analysis by examining the ability and racial/ethnic profile of students attending charter schools, how different types of charter schools are affecting student achievement, whether charter schools have higher student turnover rates, and the effect charter schools are having on TPSs. The answers to these questions will help inform policymakers as they wrestle with how to move forward with charter schools.

The examination of these questions in Philadelphia is part of a multi-state study of charter schools that will produce a larger report set to be released in late summer 2008. By examining these questions across geographic locations, we may gain a greater

⁴ In Pennsylvania, all subgroups of 40 or more students must meet AYP thresholds. In the 2006-07 school year, Philadelphia school district TPSs had on average 3.2 subgroups to meet AYP targets compared to only 2.3 subgroups across the district charter schools (Piotrowski, 2007).

understanding of the types of policies and environments that can produce effective charter schools.

The Growth, Authorization, and Oversight of Charter Schools

In Philadelphia, much of the growth of charter schools has been concomitant with other interventions initiated by 2001 state take-over of the district and the creation of a School Reform Commission with members appointed by the governor and the mayor. The state takeover led to a number of reforms including the adoption of district-wide core curriculum and, most notably, a “diverse provider” model which led to over 40 of the district’s lowest-performing schools to be managed by seven for-profit and nonprofit organizations (Useem, et al, 2006; Gold, et al., 2007). However, it should be noted that these schools are not charter schools and, therefore, are not the focus of this report.⁵ Rather, we focus on charter schools, which first entered the Philadelphia landscape in 1997-98 school year and have grown to over 60 charter schools in 2007-08 school year.

This growth, which is highlighted in Figure 1, has created new educational opportunities for students within the district. Philadelphia’s charter schools were initiated by a vast array of individuals and organizations, including educators, politicians, community groups, and social service organizations. The schools’ mission statements reflect their varied origins and address a wide range of themes such as community, family, career, cultural heritage, as well as support for academic achievement.⁶

The process for and structure of authorizing these schools has been somewhat contentious. In December 2007, the School Reform Commission adopted a new charter school policy to provide realistic guidelines for overseeing and supporting the district’s charter schools (Woodall, 2007)⁷ Before, Philadelphia, like many other charter authorizers, had minimal guidelines for approving, monitoring, supporting, or revoking

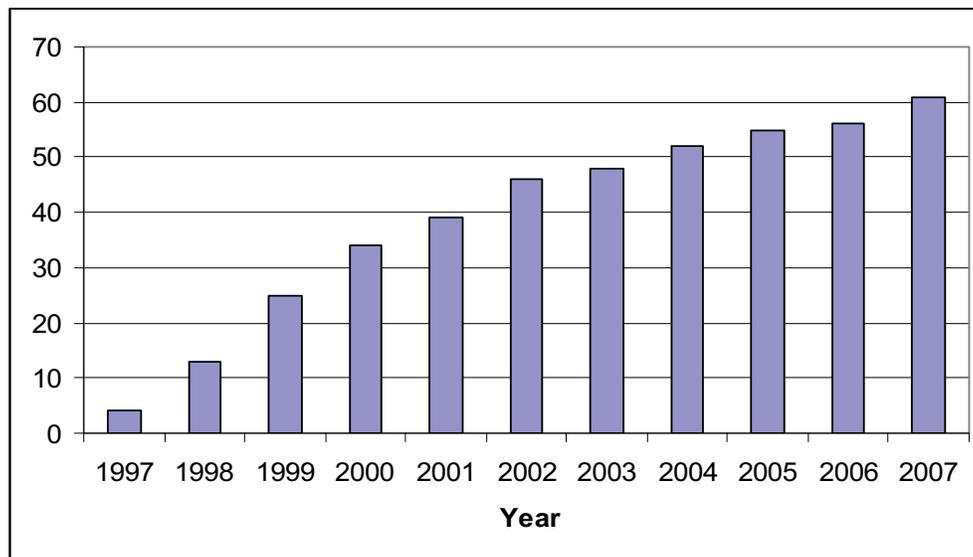
⁵These schools have some flexibility in relation to district mandates. However, they have less autonomy than charter schools, are not designed to be “schools of choice” and largely serve students that previously attended these schools.

⁶ See Appendix A for additional information about the themes of Philadelphia’s charter schools.

⁷ The adopted policy includes details for evaluating and monitoring charter schools and has provisions for considering new charter applications every two years instead of annually. It includes provisions for district visits to charter schools and identifies factors that will be considered in the charter renewal process such as adequacy of fiscal management and attainment of academic success as defined by the federal No Child Left Behind law.

charters (Gau, Finn, and Petrilli, 2006). Philadelphia has even greater latitude in creating charters than most other districts in the state as a result of the state take-over in 2001.⁸

Figure 1: Number of Charter Schools in Philadelphia Over Time



Funding Charter Schools

While this study does not focus on funding, an understanding of how charter schools are funded provides important context for examining the policy implications of charter schools. Funding for charter schools is largely a function of the number and types of students a school enrolls. Charter school advocates argue that this funding mechanism creates accountability by allowing families to transfer their children out of the schools when their needs are not being met. The school then loses the revenue associated with that student. However, at the same time, these advocates decry the inequitable funding of charter schools (Osberg, 2006).⁹ In Pennsylvania, charter schools are entitled to “no less

⁸As documented in SRC resolutions, PA statue 83 of 2001, which authorized the state take-over and created the School Reform Commission, was used by the Commission to create charter schools in ways other than those allowed by the Charter Law. In particular, the district was able to transition several regular schools to charter schools without the agreement of their staff and to create catchment areas for these schools for their first year (or longer in at least one such case). This contrasts with the state charter law that requires participation by teaching staff in the transition to charters and requires admissions to charters through a lottery process.

⁹ In a recent study by the Fordham Foundation, researchers examined funding across 16 states (which did not include Pennsylvania) and found that on average, charter schools receive about 22 percent less, or about \$1,800 less, per pupil than the school districts that surround them (Finn, et al, 2005). In addition, in some

than the budgeted total expenditure per average daily membership of the prior school year, excluding budgeted expenditures of the district of residence for nonpublic school programs; adult education programs; community/junior college programs; student transportation services; special education programs; facilities acquisition, construction and improvement services; and other financing uses, including debt service.”¹⁰,¹¹ In examining Pennsylvania charter schools, Miron and colleagues found in a 2002 study that the gap in funding of \$461 per pupil including all sources (private and public) and a funding gap of \$754 per pupil excluding private sources (Miron et al, 2002). (These values approximately equate to 6 and 9 percent less than the host district operating revenue). A later study by AFT found a similar funding gap of about \$750 per pupil (Nelson, et al. 2003). However, both sets of authors note that the districts do provide transportation services, which may make up a significant portion of the gap.

The Philadelphia school district currently pays \$7,708 for every non-special education student enrolled in a charter school and \$16,760 for every special education student enrolled (McCaffrey, 2008).¹² Recent media accounts suggest a substantial portion of these students formerly (or would have) attended private or parochial schools, which creates a new financial liability for districts (McCaffrey, 2008).¹³ In a 2007 analysis of Philadelphia’s persistent deficits, Pennsylvania State Budget Director Michael Masch indicated that reimbursement to charter schools account for the largest growth in Philadelphia school district expenditures over the last five years (Masch, 2007). Recognizing these challenges, the state provides subsidies to offset districts’ financial responsibilities to charter schools. The Commonwealth of Pennsylvania’s 2007-08 budget included a line for charter school reimbursements for up to 30 percent (subject to availability of state funds) of districts’ expenditures for charter schools in the previous year. According to state records, Philadelphia paid \$240 million to charter schools in the

states, including Pennsylvania, charter schools do not receive resources for debt financing of facilities and must pay for facilities out of operating revenue.

¹⁰ http://www.pde.state.pa.us/k12_finances/lib/k12_finances/24_PS_17-1725-A.pdf

¹¹ However, charter schools do receive fund for maintenance expenditures of facilities. In addition, charter schools can receive state subsidies for leases (http://www.pde.state.pa.us/constr_facil/lib/constr_facil/2005-2006_Charter_School_Lease_Program_Guidance.pdf) and grants for start-up costs (Miron et al).

¹² These values were verified by Christina Ward, the district’s director of special finance (Phone conversation on February 15, 2008).

¹³ These patterns of migration from private to charter schools are consistent with patterns observed in research in Michigan (Toma et al., 2006).

2006-07 year for a reimbursement of approximately \$78 million, which was received the following year,¹⁴ leaving approximately 67 percent of the charter school costs to be offset in other ways.

Charter advocates argue that these fiscal pressures create healthy competition for school districts forcing them to improve the quality of education and to be more efficient. In addition, these advocates argue that some of the burden has been lifted from the TPS because they no longer must serve the students who have transferred to charter schools. Opponents counter that school districts cannot easily offset the loss of individual students because they have existing infrastructures of teachers, staff, and facilities that are not easily modified in the short-run.

In general, this discussion suggests that the funding is not only a challenge for charter schools, but is also a challenge for school districts like Philadelphia as more and more students choose to attend these schools. While the loss of revenue to school districts may create healthy competition, it also may put some districts in a bind if they are not able to accurately project the number of students transferring to charter schools.

Data for current analysis

To address the questions laid out in the introduction, we collected longitudinally linked student-level data from the Philadelphia School District over the school years 2000-01 through 2006-07. Longitudinal student-level data provides the ability to track students as they move from TPSs to charter schools and vice versa. This is important because it not only allows us to examine which students are most likely to go to a charter school, but also allows us to examine the performance of students before, during, and after attending a charter school. It also provides the ability to see how the performance of individual students in TPSs changes as charter schools are introduced within the city.

Included in the data for each student are school identifiers to track student movement between schools, student grade, race/ethnicity, and test scores in both math and reading. In the period under examination (2000-01 through 2006-07), students in Philadelphia took three kinds of annual achievement tests in reading and math, varying with the school year and grade as listed below:

¹⁴ http://www.pde.sate.pa.us/education_budget. Accessed 01/28/07

- Pennsylvania System of School Assessment (PSSA) tests for math and reading for grades 5, 8, and 11 annually beginning in spring 2001 and grades 3 through 8 and 11 in spring 2006 and 2007;
- Stanford 9 tests in math and reading in grades 3, 4, 7, and 10 in spring 2001 and spring 2002.¹⁵
- Terra Nova tests in math in grades 2 through 10 annually in the springs of 2003 through 2005 and in grades 2, 9, and 10 in spring 2006.
- Terra Nova tests in reading in grades 1 through 10 annually in the springs of 2003 through 2005 and in grades 1, 2, 9, and 10 in spring 2006.

Although we were able to get the Stanford 9 test results for non-charter students in 2001 and 2002, we were unable to get these data for charter students. However, it is still valuable to have these data in these years because it can help track the performance of students who later enrolled in charter schools.

Because there is no consistent scale across the various tests on which to gauge absolute changes in student achievement over time, we convert all scaled test-score results into rank-based z-scores, by year and grade, with a mean of zero and a standard deviation of one. Specifically, we sort all student scores by rank and then convert them to z-scores that are normed across the entire district-wide population of tested students in that subject and grade. This conversion does not require that students have the same rank on one test as on another, but it assumes that differences in the distribution of students on different tests are not correlated with charter status. Random differences in student ranks across different tests would introduce noise, but not bias, to the analysis. The conversion of scaled scores to rank-based z-scores means that we cannot make claims about the absolute amount of learning in one school or another (lacking a psychometrically valid developmental scale), but it permits an examination of changes in rank with fewer assumptions than would be needed under other kinds of scaling.¹⁶ In cases in which

¹⁵ In the spring of 2002, the Stanford 9 4th grade test was only administered to K-4 schools and not to K-5 or K-8 schools (email correspondence with Philadelphia School District Director of Accountability Mike Schlesinger, February 16, 2008).

¹⁶ For further discussion of the use of rank-based z-scores, see Gill et al. (2005).

students took both the Terra Nova (TN) and PSSA, we used the PSSA because it is the state accountability measure and, in recent years, has been administered in more grades.¹⁷

In addition, because the district is interested in whether certain types of charter schools are creating greater achievement gains than others, we reviewed the mission statements of each charter school to develop various categories of charter schools. These categories are highlighted in the chart in Appendix A. The approach to creating this chart combined an inductive analysis of the mission statements with a review of the themes identified in previous research by Miron, Nelson, and Risley (2002). The inductive analysis produced categories that largely overlap the categories of Miron and colleagues. By its nature, an analysis of the themes contained in charter school missions cannot address many factors relevant to the success or failure of charter schools.¹⁸ However, this analysis of school missions is one starting place for identifying the range of differences and similarities among Philadelphia's charters.

We also categorized schools based on the grades charter schools serve. Any school serving at least one grade in grades 9 through 12 is considered a charter high school while any school serving at least one grade in grades K through 8 is considered a K-8 school. In total, there were 21 schools serving at least one 9 through 12 grade and 45 schools serving at least one K through 8 grade in the 2006-07 school year. Ten charter schools actually serve students both in primary and high school grades and are considered both charter primary and high schools for the purposes of our analysis.

¹⁷The PSSA is the state accountability test and therefore can be considered a high-stakes test. By contrast, the Terra Nova and SAT9, which are nationally normed tests, may be considered low-stakes measures in Philadelphia because there are no direct consequences for students or educators based on performance. There are advantages and disadvantages to using scores from state accountability tests for evaluations such as this one. Because these tests are developed to be aligned with state content standards, they may be more likely than other measures to reflect the educational goals of the schools in that state. However, there is ample evidence that high-stakes tests lead to instructional changes that can inflate scores, and that gains on these tests do not always generalize to other tests that are intended to measure the same outcomes (Hamilton, 2003). In the past, when one test is not administered in consecutive grades across years, researchers have often combine high-and low-stakes tests to track performance of students over time (May et al., 2004).

¹⁸ It is important to note that the entire set of categories has been defined on the basis of the minimal information available within mission statements. The definitions of each category did not incorporate broader information about each school and as such are not intended as interpretative statements about a school's practice or philosophy.

Distribution Analysis

Because high or low test scores in charter schools could be the result of the students they attract and because the interaction of students with diverse backgrounds and ability levels can have positive social and academic effects for students (Frankenberg and Lee, 2003; Zimmer & Toma, 2000; and Summers & Wolfe, 1977), it is important to examine the types of students who are moving from TPSs to charter schools. Critics of charter schools fear that they will further racially/ethnically stratify an already deeply stratified system and will skim off the best students from TPSs, harming the students left behind. In contrast, some charter supporters hope that charter schools will improve racial integration by letting families choose schools outside of neighborhoods where housing is racially segregated.

A number of studies have examined the racial/ethnic representativeness of charter schools (Powell et al., 1997; Miron and Nelson, 2002; Frankenberg and Lee, 2003), but these studies have generally examined whether the student racial/ethnic makeup of charter schools is similar to the districts or states where they are located in and did not examine the actual counterfactual for the charter students—what would have been the racial/ethnic makeup of the school the students would have attended if they had not transferred to a charter school? Nor did these studies examine whether the charter schools are “creaming” off the highest-achieving students from the TPSs.

To address these questions, researchers need longitudinally linked student-level data, which provides the ability to track students as they transfer from TPSs to charter schools. Understanding how charter schools affect the mixing of students requires a dynamic model that uses longitudinal data to examine the movements of individual students. Two studies that have used such dynamic models are Bifulco and Ladd (2007) and Booker, Zimmer, and Buddin (2005), both of which examine migration patterns of students choosing to transfer to a charter school. We build on the models used by these researchers to examine the distributional effects of Philadelphia charter schools.

Before presenting results, it is important to provide some context of the racial/ethnic makeup of the school district. In the 2006-07 school year, the district as a whole had 63 percent African American students, 14 percent white students, 16 percent

Hispanic students, and 7 percent students of other race/ethnicities. On average, charter school enrollments in the district have a similar distribution by race and ethnicity, with 65 percent African-American students, 18 percent white students, 13 percent Hispanic students and 4 percent students of other racial/ethnic groups.

These aggregate numbers, however, tell us nothing about how students are distributed in individual schools. To examine how charter schools affect the racial/ethnic distribution at the school level, we use the longitudinal student-level data to compare the percent of white, black, and Hispanic students in the charter school a student attends relative to the TPS the student left, as shown in Table 1. Table 1 also compares the racial/ethnic percentages in the charter school a student attends who share that student's race/ethnicity to see whether students tend to sort themselves into schools with a higher percentage of students of their own race/ethnicity. (To preserve space, we did this analysis for the three major population groups of African American, white, and Hispanic students but not for other small racial/ethnic categories. Therefore, the rows do not add up to 100 percent).

This analysis examines only students who switch into charter schools after they have been in TPS and does not consider what the racial/ethnic makeup would have been in a TPS for students who never attended TPSs—most importantly, students that begin in charter schools in Kindergarten. We should also note that the analysis removes students that are making “structural” moves—i.e., students who are switching from elementary to middle schools and middle to high schools—because the prior TPSs may not represent a strong counterfactual for the racial/ethnic makeup of the school that the students would have attended.

Overall, there does not appear to be much difference in the racial/ethnic makeup of the charter schools students enter and the TPSs student exit. For instance, on average, there is just over a one percent increase in African American and Hispanic students in the schools students enter relative to the schools students exit and less than one percent decrease of white students in the schools students exit relative to the schools students enter. However, a closer examination of moves by the race/ethnicity of the student reveals, that students are more likely to transfer to schools with a slightly higher

proportion of students who share that student’s race/ethnicity. For instance, African American students leave schools that are on average 84 percent African American and transfer to charter schools that are on average 87 percent African American. Similar patterns emerge for white and Hispanic students. White students transfer from schools that are on average 40 percent white to schools that are on average 49 percent white. Hispanic students transfer from schools that are on average 45 percent Hispanic to schools that are on average 56 percent Hispanic. Overall, the analysis suggests that Philadelphia students who switch to charter schools are slightly reducing their exposure to students of other races/ethnicities.

Table 1: Comparison of the racial makeup of the charter schools students attend relative to the TPSs they left

	Percent African American	Percent White	Percent Hispanic
Charter School Students Attend	74.5	8.6	14.9
TPS Students Previously Attended	73.1	9.3	13.4
Difference	1.4	-0.7	1.5
Percent African American			
Charter School African American Students Attend	87.0	4.6	6.9
TPS School African American Students Previously Attended	84.2	5.5	7.0
Difference	2.8	-0.9	-0.1
Percent White			
Charter School White Students Attend	36.1	48.7	10.9
TPS School White Students Previously Attended	39.5	39.7	12.3
Difference	-3.4	9.0	-1.4
Percent Hispanic			
Charter School Hispanic Students Attend	35.5	6.9	55.9
TPS School Hispanic Students Previously Attended	38.1	12.0	45.4
Difference	-2.6	-5.1	10.5

Note: The table does not include the moves of non-African American, non-white, non-Hispanic students, so the rows do not add up to 100 percent.

To understand the types of students charter schools serve and whether charter schools are “cream skimming,” we documented prior achievement levels, measured in the year before the student transferred to a charter, and examined whether these

achievement levels were higher or lower than those of the peers they left in their TPSs. Achievement levels are normed by grade within the district with a mean of zero and standard deviation of one across all tested students. Negative values indicate a below-district-average test score while positive values indicate an above-district-average test score. Again, readers should bear in mind that this analysis examines only students who switch into charter schools after they have been in TPS and does not examine the performance of students that we cannot observe in TPSs. Also, as in the racial/ethnic distribution analysis, we removed structural moves from the analysis.

Table 2 compares the test scores of a student moving to a charter school to the average test scores of his or her peers within the same grade at the TPS the student left. The table presents these moves across all types of students and by students of different race/ethnicities. The results suggest that students transferring into charter schools have math and reading test scores that are slightly below the district-wide average, by 0.11 and 0.05 of a standard deviation in math and reading, respectively. In addition, we observe that the charter schools are attracting students from below-average schools. The average math and reading test scores of students in schools from which students transfer from are 0.17 and 0.18 of a standard deviation below the district-wide average. However, this implies that students leaving TPSs have slightly higher test scores than the average test scores of the peers they are leaving behind—by 0.06 of a standard deviation in math and 0.13 of a standard deviation in reading. This pattern is true for white and African American students, but less true for Hispanic students.

The results from Tables 1 and 2 suggest that students are transferring to charter schools with a slightly larger population of students of the same race/ethnicity and that students who transfer to charter schools have pre-transfer achievement levels that are slightly below district-wide averages but slightly above those of their peers from the schools they leave behind. These results may have implications for the achievement of students both in charter schools and TPSs as they create different peer environments for both sets of schools.

Table 2: Comparison of the Average Math and Reading Test Scores of the TPSs Students Leave and the Charter Schools They Transfer to

	Overall	White Students	African American Students	Hispanic Students
Prior Math Scores of Movers	-0.11	0.47	-0.16	-0.20
Prior Math Scores of TPS Peers	-0.17	0.26	-0.21	-0.20
Difference with TPS Peers	0.06	0.21	0.05	0.00
Prior Reading Scores of Movers	-0.05	0.53	-0.08	-0.23
Prior Reading Scores of TPS Peers	-0.18	0.22	-0.19	-0.25
Difference with TPS Peers	0.13	0.31	0.11	0.02

Student Achievement

In recent years, studies have attempted to examine the impact of charter schools on student achievement in Arizona, California, Florida, Michigan, Ohio, North Carolina, Texas, Wisconsin, and Pennsylvania. In addition, a few recent studies have examined student achievement in charter schools nationally (Nelson et al., 2004; Hoxby, 2004). Some of this research, including an evaluation of Pennsylvania charter schools (Miron, Nelson, and Risley, 2002), has relied on school-level data or cross-sectional comparisons of achievement in charter schools and TPSs at a single point in time (Nelson et al., 2004; Hoxby, 2004). A key weakness of a school-level analysis is the high degree of aggregation, which masks changes over time in the school’s population. In essence, school-level data may not pick up the nuances of school characteristics and can only provide an incomplete picture of why outcomes vary across schools. Meanwhile, point-in-time data, even at the student-level, cannot account for the amount of time spent in different schools and cannot factor out the various non-school forces at work. Distinguishing the effects of schools from the effects of family and other external factors is challenging under any circumstances, and it is especially problematic in evaluating charter schools, where students are likely to differ from those in TPSs simply because they have chosen to attend charter schools. These differences between choosing and non-choosing students may be related to achievement in positive or negative ways, thereby producing “selection bias” in comparing achievement in charter schools and TPSs.

Researchers have dealt with the selection bias in charter enrollment in two ways: randomized experiments and longitudinal analyses. Both methods allow researchers to account for the amount of time a student has spent in a particular school, and both methods address differences among student populations served. Randomized experiments are often considered the “gold standard” in research, because, by assigning subjects randomly to the treatment condition or control condition, they ensure that differences observed later are the result of treatment rather than the result of background differences between the subject groups.

A few studies are beginning to examine oversubscribed charter schools that randomly admit students through lotteries. For instance, Hoxby and Rockoff (2004) examined four charter schools in Chicago, which provided evidence that this set of charter schools is outperforming TPSs. Later, Hoxby and Murarka (2007) used a similar design to evaluate 47 charter schools in New York City and found a small positive achievement effect for students attending charter schools. These studies have strong “internal” validity—in other words, the results have strong implications for schools included in the evaluation. One drawback of a randomized design approach is that while it produces valid and reliable results for the set of charter schools examined, it may have limited implications for charter schools that are not part of the analysis. In other words, these studies have weak “external” validity. In order to conduct a randomized experiment of charter schools, researchers have relied upon randomly assigning students for schools that are over-subscribed with substantial wait lists. Therefore, these studies may have limited implications for those schools that do not have wait lists. In fact, one would expect schools with wait lists to be the best schools and it would be surprising if they had the same results as other charter schools.

When randomized designs have not been possible, or when researchers wanted to be more inclusive in their analysis of charter schools, researchers have often used a fixed-effect approach to deal with the selection bias, which requires longitudinal student-level data.¹⁹ Fixed-effect approaches minimize the problem of selection bias by examining the academic gains made by individual students over time, factoring out those students’

¹⁹ The fixed-effect approach, along with a randomized design approach, was advocated by collection of research experts known as the charter schools achievement consensus panel organized by the Center for Reinventing Public Education (Betts and Hill, 2006).

baseline achievement levels. Moreover, they permit “within-student” comparisons of achievement gains, examining changes in the achievement trajectories of individual students who move from TPSs to charter schools, or vice versa. To date, a handful of studies have used this fixed-effect approach to evaluate charter schools in individual states and cities: Solmon, Paark, and Garcia (2001) in Arizona; Bifulco and Ladd (2006) in North Carolina; Gronberg and Jansen (2001); Hanushek, Kain, and Rivkin (2002); and Booker et al. (forthcoming), (separately) in Texas; Zimmer et al. (2003), Betts et al. (2006), and Zimmer and Buddin (2006) (separately) in California; Sass (2006) in Florida; Witte et al. (2007) in Milwaukee with mixed results.

Because we do not have charter school wait lists to conduct a randomized design, we build upon the above literature and use a fixed-effect approach to conduct the analysis. However, focusing on students “switching” between TPSs and charter schools and vice versa has its limitations as it does not incorporate all students attending charter schools in the analysis. We describe and examine this limitation more fully when we describe our results.

Analytical Details

As previously indicated, outcome indicators for the achievement analyses are math and reading z-scores for individual students followed longitudinally over time. The longitudinal nature of the data allows the use of a student fixed effect to control for any time-invariant characteristics of the student, such as family status and ability. The fixed-effect model is implicitly a “value-added” model that aims to assess the contribution of attending a charter school.

The formal model for our analysis is specified in equation 1.²⁰ To examine achievement effects, we use achievement *gains* ($A_{jt} - A_{jt-1}$). Using gains allows the analysis to compare the student’s achievement gains while attending a charter school with his/her achievement gains while not attending a charter school. Examining gains accounts for the possibility that students with similar baseline achievement scores have different underlying achievement trajectories. Formally, the model is specified as:

²⁰ The analysis incorporates the clustering of student achievement results within schools, thereby ensuring the estimation of robust standard errors.

$$A_{jt} - A_{jt-1} = \alpha C_{jt} + \pi Mob_{jt} + \mu_j + \theta_{gt} + v_{jt} \quad (\text{Equation 1})$$

Where $A_{jt} - A_{jt-1}$ is a measure of the achievement gain of the j^{th} student in the t^{th} year; C_{jt} is an indicator whether student j attend a charter school in the t^{th} year, Mob_{jt} is an indicator of whether student j transferred to a new school in the t^{th} year, μ_j captures individual student fixed effects, θ_{gt} captures grade-by-year fixed effects, and v is the random disturbance term.

Although equation 1 provides an overall estimate of charter school effects, we are also interested in the effects over time and by types of students. Therefore, we modified equation 1 to carry out additional analyses.

First, a variation of equation 1 is used to examine the effects by the number of years a student attends a charter school. Specifically, we examine the effect for students attending a charter school one, two, or three or more years. Previous research has often shown that there may be a drop in the performance as students transition into a charter school (Booker et al, forthcoming; Bifulco and Ladd, 2006; Sass, 2006). The formal model for the analysis is specified in equation 2 where $YRone$ takes on the value of 1 when the student is in the first year of attending a charter school and 0 otherwise; $YRtwo$ takes on value of 1 when the student in the second year of attending a charter school and 0 otherwise; and $Mult$ takes on the value of 1 when the student is the third or more year of treatment and 0 otherwise. Because about half of the charter schools started before the time period of our data set, we cannot determine the tenure within a charter school for some students. Therefore, we create a variable $Nsure$ that takes on the value of 1 if we cannot determine the tenure of the student in a charter school and 0 otherwise.

$$A_{jt} - A_{jt-1} = \alpha YRone_{jt} + \phi YRtwo_{jt} + \beta Mult_{jt} + \lambda Nsure_{jt} + \pi Mob_{jt} + \mu_j + \theta_{gt} + v_{jt} \quad (\text{Equation 2})$$

Second, equation 1 is expanded to include an interaction term (R) to examine whether the achievement effects of charters vary across racial/ethnic categories. The expanded model is displayed in equation 3:

$$A_{jt} - A_{jt-1} = \delta C_{jt} R_j + Mobjt + \mu_j + \theta_{gt} + v_{jt} \quad (\text{Equation 3})$$

Third and finally, we examine the effects by various types of charter schools, including by grade arrangement, number of years charter schools been in existence, and by the focus of the charter schools. To examine charter schools by grade arrangement, we categorized charter schools that serve 9-12 grades and K-8 grades. Because a few charter schools have unique grade configurations that span both primary and high school grades, a limited number of charter schools are included in both categories. To examine whether student achievement varies by the number of years a charter school has been in existence, we categorize charter schools as schools that are less than three years old and schools that are three or more years old. We grouped schools by age in this way because the general literature on school reforms and for charter schools suggest it may take three or more years for reforms to take hold. Finally, we categorized charter schools by the areas of the focus as described by their mission statement in the original charter contract. For each of these categories, we run separate models estimating the effect by using a dichotomous variable indicating whether a student attends a particular type of charter school for a particular year.

Interpretation of Results

The results from equations 1, 2, and 3 are presented in Table 3. While each of these models is run separately, the results are presented collectively. In addition, we present coefficient estimates by type of charter schools in Tables 4 and 5. For simplicity, only the charter related coefficients are presented. More detailed results can be found in Appendix B. Because all these analyses use fixed-effect models, all student characteristics that remain constant over time (while implicitly controlled for) are differenced out across all models. As a result, demographic characteristics, such as race and ethnicity, drop out of the models.

Also, the coefficients estimates are presented in standardized effect sizes (i.e., units of standard deviations). These effect sizes are not easily translated into publicly understood metrics, such as proportion of students achieving proficiency. Often researchers use a guideline provided by Jacob Cohen (1988) as benchmark for

interpreting the magnitudes of effects in the social sciences. His guideline suggests that effect sizes of 0.20, 0.50, and 0.80 of a standard deviation unit should be considered small, medium, and large, respectively. However, recently, researchers in education arena have also used landmark studies such as the Tennessee class size reduction study as a source of comparisons, which had an effect size ranging from 0.15 to 0.25. In addition, another source of comparison from a policymaker's perspective is the achievement gap between African American and white students and Hispanic and white students (Hill et al., 2007). Using the 2006-07 PSSA test scores, the achievement gap between African American and white students is 0.60 of a standard deviation in math and 0.56 of a standard deviation in reading, respectively. The achievement gap between Hispanic and white students is 0.62 of a standard deviation in math and 0.70 of a standard deviation in reading. These comparisons can provide greater context and guidance for interpreting the magnitude of effect than simply using Cohen standards.

Presentation of Results

In Table 3, we present the overall student achievement estimate in both in math and reading as specified by equation 1. The table also presents the results from equation 2 of attending a charter school one year, two years, or three or more years. Finally, the table presents the results from equation 3, which estimates differential effects across student of different race/ethnicities. In all cases, the coefficient estimates are in standardized units.

Overall, the results suggests that charter school performance is statistically indistinguishable from TPS students as neither the math nor the reading coefficient estimates for charter schools are statistically significant. This result is largely consistent with the existing literature that has generally found small negative, small positive, or no effects for charter schools across various locations (Solmon, Paark, and Garcia, 2001; Gronberg and Jansen, 2001; Hanushek, Kain, and Rivikin, 2002; Zimmer et al., 2003; Bifulco and Ladd, 2006; Sass, 2006; Zimmer and Buddin, 2006; Betts et al, 2006; Witte, et al., 2007; Hoxby and Murarka, 2007; Booker, et al, forthcoming).

However, the analysis suggests that for students attending a charter school in the first year, charter schools have a negative and statistically significant effect in math and

no significant effect in reading. However, the effect in math is small. For students attending charter schools for two years, or three or more years, the estimates are not statistically significant in math or reading and the coefficient estimates are very close to zero. Therefore, one could conclude that there may be a small dip in math achievement of students in their first year of attending charter schools, which is generally consistent with the previous literature (Booker et al., forthcoming; Bifulco and Ladd, 2006; Sass, 2006).

Finally, in terms of race/ethnicity, we found no evidence that charter schools are having a positive or negative effect on student achievement as none of the coefficient estimates are statistically significant. Again, this is consistent with the results found in other research (Zimmer and Buddin, 2006).

Table 3: Overall Math and Reading Student Achievement Effects, Effects by Years of Charter School Attendance, and by Race/Ethnicity

Variable	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
Overall Estimate	-0.03 (0.02)	-0.03 (0.02)
Attending a Charter School One Year	-0.06* (0.03)	-0.02 (0.02)
Attending a Charter School Two Years	0.01 (0.02)	0.00 (0.02)
Attending a Charter School Three or More Years	-0.01 (0.02)	0.01 (0.02)
African American Students	-0.05 (0.02)	-0.03 (0.02)
Hispanic Students	0.01 (0.04)	0.00 (0.02)
White Students	-0.03 (0.03)	-0.04 (0.03)
Other Students	-0.01 (0.05)	0.03 (0.06)

* Indicates statistical significance at the 5 percent level.

Sensitivity analysis

While the vast majority of the literature using longitudinal student-level data has employed the fixed-effect approach described above, some researchers have raised concerns with this approach (Hoxby and Murarka, 2006; Ballou, et al., 2007). These researchers note that the fixed-effect approach provides an estimate of student achievement only for students who switch from a TPS to a charter school or vice versa (“switchers”). Students who remain in either charter or TPSs for the duration of the analysis do not contribute to the estimate because the method requires a comparison of their results in both contexts (charter schools and TPSs).

These researchers note that switchers may differ from non-switchers in important ways, possibly biasing results that rely exclusively on switchers.²¹ Researchers wonder about the motivation of students switching into charter schools mid-way through their educational careers. For instance, Hoxby and Murarka (2006) argue that a fixed-effect approach cannot account for the possibility that students who perform poorly on a standardized test may be especially likely to transfer to a charter school the following year. The dip in the performance could be a real dip caused by poor educational instruction, a disruption in a student’s life unrelated to a school, or it could be just noise in test scores.²² If students and their families base their decision to switch to a charter school partly on the students’ prior year test scores, then any gains in student achievement while attending a charter school could be the result of mean reversion in their performance rather than an effect from attending a charter school. It is conceivable the alternative could happen as well—a student could have a jump in performance prior to transferring to a charter school and, therefore, any drop in student achievement gains could also be the result of mean reversion.

²¹ Ballou et al. (2007) explore these issues by examining Idaho charter schools using both a student fixed-effect model, which only uses switchers, and by estimating the effect by using all tested charter and non-charter students. Exploring both approaches, they find conflicting results. The authors argue that the bias from only examining switching students in a student fixed-effect model may be greater than the “self selection” bias the model attempts to correct and may imply that researchers should not exclusively rely upon fixed-effect models. However, in an interesting counter example, Julian Betts and colleagues (2006a), using data from San Diego, found that a fixed-effect approach produces results (at least in math test scores) much closer to the result of a randomized design approach than other non-experimental designs.

²² All tests have some level of noise in their measurement, and some students will score lower or higher on a single administration of a test than the average score they would receive if they took multiple, similar tests. Thus, a student could score poorly on a particular test in one year and then the next year score higher as they bounce back to a score more reflective of their learning.

To examine this issue, we first examined the average achievement levels of students one year prior to attending a charter school relative to their average achievement levels two years prior to attending a charter school. We found no difference in math levels in the two years prior to attending a charter school and a slightly higher reading level of 0.01 one year prior to attending a charter school relative to two years prior to attending a charter school. Overall, this indicates that there is no dip in performance of students prior to attending a charter school.²³

We also examined the average achievement gains for students that we only observe in a charter school versus students we can observe switching between a TPS and a charter school or vice versa. The average achievement gains of switchers and non-switchers are not statistically different. This suggests that the achievement gains across the two groups of students are similar, minimizing the possibility that the analysis would lead to different results if all charter school students were included and not just the switchers.²⁴

In addition, we examined whether the estimates change if we only include students who attend a school that has its lowest grade start after the grade a student can first have a gain score. For instance, in the 2005-06 school year, the lowest grade tested in math is second grade and the lowest grade a student could have a gain score is third grade. Therefore, to be included in our analysis a student must attend a school that a lowest grade of at least 3rd grade. In these cases, all students attending these schools would have had to switch into these schools.²⁵ This analysis does not lead to substantively different results as both of the coefficient estimates remain statistically insignificant.

Finally, because a number of charter schools started prior to the beginning of the data set in 2000-01, a substantial portion of our estimate is driven by comparing student gains in charter schools relative to their gains in TPSs *after* the students transfer out of a charter school rather than comparing student gains of students transferring from TPSs to

²³ Because the achievement outcome is examined in gains, we also examined whether the math and reading gains of students prior to attending a charter are substantially different from 0. The math and reading gains are 0.00 and 0.02 prior to attending a charter school. Again, this suggests that students did not experience a dip in performance prior to attending a charter school.

²⁴ In appendix C, we include a table that compares the racial/ethnic makeup of switching students relative to any student that ever attend a charter school.

²⁵ Because the grades tested changed over time, the lowest grade for school varies by year. In the early years, the lowest grade at which a student can have a gain is 4th grade. However, in later years the lowest grade in which a student could have a gain is in 2nd grade in reading and 3rd grade in math. Therefore, the restriction of student inclusion depends upon the year and grade.

charter schools. This type of comparison is somewhat complicated. For instance, if a student attends a charter school for grades K-8 and then transfers into a TPS high school and his/her gains improves relative to other students in the district (which would produce a negative coefficient estimate), is it because the TPS is providing a better education or because the charter school provided a good educational foundation for high school? Alternatively, if a student transfers into a TPS high school and his/her gains decline more relative to other students in the district (which would produce a positive coefficient estimate), is it because the TPS is providing a poorer education or is it because the charter school did a poor job of preparing the students? Because the interpretation is somewhat complicated, we created a dichotomous variable indicating whether a student transferred from a charter school to a TPS in a particular year and reran Equations 1 and 3 with this variable included to control for students switching out of a charter school. The coefficient results across the models remain statistically insignificant, which adds robustness to our results.

The results across these sensitivity analyses appear to be robust leading us to the general conclusion that the performance of students attending a charter schools is generally on par with students attending TPSs.

Student Achievement by Charter Type

Because policymakers want to know which types of charter schools are the most effective in raising student achievement and because previous research suggests that charter schools are not monolithic in their effectiveness (Buddin and Zimmer, 2005a), we examine the performance across the various charter school types in Table 4. We first examine whether the effects by the number of years in which a charter school has been in existence. In addition, we examine the effects for charter high school students and charter schools K-8 students.

We find no significant differences in impacts between those schools that have been in operation for three years or less and for charter schools that have been in operation for four or more years, and in neither case are the results statistically significant. But the analysis shows grade-level differences, indicating a relatively small

positive effect for charter high schools and a small negative effect for charter primary schools in both math and reading.

Table 4: Effect by the Age and the Grades Served of Charter Schools

Variable	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
Attending a Charter School in the Schools First Three Years of Operation	-0.04 (0.04)	-0.02 (0.03)
Attending a Charter School after the School has been in Operation for At Least Four Years	-0.03 (0.02)	-0.03 (0.02)
Charter High School Students	0.07* (0.02)	0.08* (0.03)
Charter K-8 Students	-0.09* (0.03)	-0.08* (0.02)

* Indicates statistical significance at the 5 percent level.

However, the results for the charter high schools could be sensitive to whether there are differential dropout rates between charter and TPSs. If, for instance, students were more likely to dropout in charter high schools, then the results for charter high schools could be biased upwards because students that dropout are most likely to experience the smallest gains. The opposite would be true if students were less likely to dropout in charter high schools. Because we do not have information on dropouts in our data and because dropout rates cannot be accurately estimated in our data, we cannot determine whether our estimates for the charter high schools are most likely biased upward or downward. Given this, we conclude that we only have limited evidence of a positive effect of charter high schools.

We also examined whether the K-8 results are robust to the assumptions of how students should perform after attending a charter school by controlling for students switching out of K-8 charter schools. Controlling for exiting out of charter schools decreases the coefficient estimates to -0.05 of a standard deviation in math and -0.04 of a standard deviation in reading and is marginally significant in math and no longer

statistically significant in reading. Therefore, the K-8 reading results are somewhat sensitive to how one interprets the effects of students switching out of charter schools.

In addition, we examined the performance of students by race/ethnicity in charter K-8 and high schools, as displayed in Table 5. Given that the bulk of students attending charter schools are African American students, it is not surprising that the coefficient estimates for African American students attending primary and high charter schools largely reflect the overall estimate. However, the analysis also suggests that non-white, non-black, non-Hispanic students (classified as “other” and are primarily Asian students) experience a positive achievement gain in reading for attending a charter high school.

Table 5: Effects by Race/Ethnicity in Primary and High Charter Schools

Variable	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
African American Students Attending a Charter High School	0.09* (0.03)	0.09* (0.03)
White Students Attending a Charter High School	-0.03 (0.06)	-0.11 (0.08)
Hispanic Students Attending a Charter High School	0.03 (0.05)	0.04 (0.05)
Other Students Attending a Charter High School	0.11 (0.06)	0.19* (0.09)
African American Students Attending a Charter K-8 School	-0.10* (0.03)	-0.08* (0.02)
White Students Attending a Charter K-8 School	-0.09 (0.08)	-0.11 (0.07)
Hispanic Students Attending a Charter K-8 School	0.00 (0.08)	-0.03 (0.05)
Other Students Attending a Charter K-8 School	-0.06 (0.06)	-0.05 (0.07)

* Indicates statistical significance at the 5 percent level.

Finally, we examine the performance of charter schools by the categories developed by examining the mission statements of the original charters for each school. Because these categories are not mutually exclusive—that is, a charter school can be classified in more than one category—we ran the analysis separately for each charter

school category. For each category, the analysis examines whether a student’s gains are greater while attending the type of charter school relative to the gains of the same student while not attending these charter schools. These gains are then compared to the gains of all other students in TPSs as well as gains of students of students in other types of charter schools. The results displayed in Table 6 suggest very little difference in charter schools by categories, with one exception: For charter schools that provide social services to the families and build student engagement in their communities, there is a statistically significant and negative effect, though the effect is fairly small. It should be noted that the number of schools within these categories are generally small, which makes it difficult to detect an effect. In addition, the categories may not fully encompass many of the differences across these schools limiting our ability to detect effects.

Table 6: Charter Effects by Categories Specified by the Original Charter Mission

Variable	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
Students Attending a Community and Family Charter School (N=11)	-0.11* (0.04)	-0.08* (0.02)
Students Attending a Citizen and Character Development Charter School (N=37)	-0.02 (0.03)	-0.03 (0.02)
Students Attending a Cultural Heritage Charter School (N=7)	-0.07 (0.04)	-0.06 (0.05)
Students Attending a Charter School Providing Support to At-Risk Students (N=10)	-0.03 (0.03)	-0.01 (0.02)
Students Attending a Charter School Providing Support for Career and Work (N=13)	-0.02 (0.04)	0.01 (0.03)
Students Attending a College Prep Charter School (N=12)	0.01 (0.04)	0.02 (0.03)
Students Attending a Charter School with a Focus on Second Language (N=8)	0.00 (0.04)	0.01 (0.04)
Students Attending a High Standards Charter School (N=12)	-0.03 (0.03)	-0.04 (0.03)
Students Attending a Technology Charter School (N=19)	0.00 (0.03)	-0.01 (0.02)

* Indicates statistical significance at the 5 percent level.
N denotes the number of schools in each category.

Competitive Analysis

One of the major tenets of the charter movement is that charter schools can provide healthy competitive pressure for TPSs. If this competitive pressure can lead to improved educational programs in the TPSs, it is possible that charter schools could actually improve student achievement in TPSs. This question is not only important in its own right, but it is also important for the student achievement analysis. If through competition, charter schools are able to raise the achievement of students in TPSs, then the achievement estimates would be biased downward. Therefore, it is worth exploring whether charter schools are creating competitive effects for TPSs.

Studies examining competitive effects typically assume that competitive effects will be felt most strongly in TPSs that are in close proximity to charter schools (Bifulco and Ladd, 2006; Sass, 2006; Zimmer and Buddin, 2005b; Holmes et al., 2003; Booker et al., 2004). Building on this research, we use two proxies for competitive pressure. First, we use a measure of the distance to the nearest charter school. Presumably, the closer a TPS is to a charter school, the more likely the school will feel competitive pressure. Second, we examine whether the level of charter school presence within a local educational market affects student achievement within TPSs by examining the number of charter schools within 2.5 miles of a TPS. Analyzing the competitive effects by two different proxies should make our analysis more robust.

Any analysis of competitive effects is complicated by the fact that charter schools may not randomly locate, but rather locate near poor performing TPSs. Analyzing the effects of charter proxies without controlling for the unobserved TPS characteristics that have led these schools to be chronically poor performing schools may bias downward estimate of the effect charter schools are having on students in TPSs. In addition, it is important to control for both observed and unobserved student characteristics associated with student performance. To achieve both of these objectives, we run a model that includes both student and school fixed effects, which controls for time-invariant characteristics of students, such as race/ethnicity and family motivation, as well time-invariant school characteristics, such as the environment of the neighborhood and quality of the facilities. To incorporate both student and school fixed effects, we run a model with a combined student and school fixed effect known as a “spell” effect, which

represents each unique student/school combination. Each student’s time of enrollment in a particular school is viewed as a “spell.” Competitive effects are, therefore, estimated by examining the growth of achievement of the same students in the same schools as charter proxies varies over time.²⁶

The competitive analysis is specified in Equation 4:

$$A_{jt} - A_{jt-1} = \alpha Comp_{jt} + \mu_j + \theta_{gt} + v_{jt} \text{ (Equation 4)}$$

where $A_{jt} - A_{jt-1}$ is a measure of the achievement gains of the j^{th} student in the t^{th} year; $Comp_{jt}$ are the various charter proxies (each run in separate models) of the j^{th} student in the t^{th} year; μ_j captures unique student/school fixed effects, θ_{gt} captures grade-by-year fixed effects, and v is the random disturbance term.²⁷

In the model, the competitive effect of charter schools on TPS students is identified by two types of comparisons. First, the model compares student achievement gains across schools with different levels of charter penetration. Charter competition is expected to manifest itself in higher student achievement gains for students where charter presence (variously measured) is more pronounced. Second, the effect is identified by changes in the number of charter schools and charter enrollment across years.

The results of the analysis are displayed in Table 7. The interpretation of the coefficients varies by the charter proxy. For distance to nearest charter school, the coefficient is the achievement gain of TPS students, measures in changes in the standardized Z-score, for each mile away from a charter school. For the number of charter schools, the interpretation is the gains in Z-scores for each additional charter school within 2.5 miles of the TPS the student attends. Overall, the results show no evidence for a competitive effect as none of the coefficients are statistically significant.

²⁶ The spell effects should also control for other sources of competition within the district, such as private schools and magnet schools, to the extent that these sources of competition remain constant over time.

²⁷ Because individual student observations within schools may not be independent, we run the analysis by clustering students by schools to create robust standard errors.

Table 7: Estimates of Competitive Effects

	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
Distance to nearest charter school	0.01 (0.06)	0.06 (0.05)
Number of charter schools within 2.5 miles	0.01 (0.02)	0.00 (0.01)

* Indicates statistical significance at the 5 percent level.

Note that the analysis only examines the competitive effect as measured in individual TPSs located near charter schools, as compared with other TPSs lacking nearby competition. It is possible that charter schools are creating pressure on the district as a whole to improve, even if they are not having differential effects on individual schools nearby. Unfortunately, there is no way to distinguish the effect charter schools have on the Philadelphia School District from the effects of other changes in district-wide operations.

Mobility

To gain a better understanding of the student achievement results, we examined whether charter schools have greater student turnover, which may reduce the ability of charter schools to improve student achievement. While charter schools may create greater school options for students, it may also cause greater churning of students. This may not only cause disruptions in a student’s educational progress, but may also disrupt schools’ operations, leading to negative effects even for students who do not transfer.

Using the longitudinal student-level data that includes school identifiers for each student and dates of entry and exit to schools,²⁸ we examine the rate of mobility within charter and TPSs. The analysis does not count structural moves—i.e., moves in which students are promoted from elementary to middle or middle to high schools. To distinguish between structural and non-structural moves, we identified the high and low

²⁸ Unlike the test score data, the entry-exit data goes back only to the 2001-02 school year rather than the 2000-01 school year.

grade of each school. If a student transfers at a grade lower than the highest grade of their school, we count that transfer as a non-structural transfer.²⁹

While this analysis is not meant to be definitive and is largely descriptive, it does provide some interesting insights. For example, one might expect charter schools to have a higher rate of transfers than TPSs because charter schools are “schools of choice” with low barriers for entry and exit. However, in examining Table 8, we observe that charters and TPSs have a similar percent of students remaining in the same school for two consecutive years. Specifically, the percent of students with 0 transfers over two consecutive years is 88 percent for charter schools compared to 84 percent for TPSs. Consequently, charter schools have slightly lower percentage of students transferring one, two, or three times.³⁰ The table suggests that the lack of a positive effect in attending a charter school cannot be explained by turnover within charter schools.

Table 8: Percent of Students Transferring within the School Year or During the Following School Year

School Type at the Start of School Year	Percent of Students Transferring by the Number of Transfers			
	0	1	2	3
Charter School	88.2	10.6	1.1	0.1
TPS	83.8	13.9	2.0	0.2

Conclusion

Our analysis suggests a mixed set of results for charter schools:

- Charter schools have proven to be quite popular since their introduction into Philadelphia’s educational landscape in 1997, as there are now over 60 charter schools serving over 30,000 students.
- The percentage of charter students reaching proficiency has improved in recent years.
- Charter schools are serving transfer students with previous achievement levels (in TPSs) that were slightly lower than the district-wide average, but slightly higher than those of the peers they left behind.

²⁹ Please see Appendix D for more details.

³⁰ In addition to examining the general turnover rate of students, we also found that 2.8 percent of students start in TPS, transfer to a charter school, and transfer back to the same TPS within a year.

- The achievement gains of students attending charter schools are approximately equivalent to the gains of students attending TPSs.
- There is little evidence that the presence of charter schools either helps or harms the achievement of students in nearby district schools.
- Charter schools are permitting students to sort themselves into schools with a slightly greater share of students of their same race/ethnicity.
- Rates of mobility in charter schools are similar to those in Philadelphia's TPSs.

This study does not claim to be a comprehensive evaluation in the array of outcomes analyzed. We examined only effects on test scores, student sorting and mobility. We expect that policymakers and citizens would take into account many other factors in assessing the value of charter schools for the city, including student attendance, graduation, college attendance, and disciplinary rates as well an evaluation of program and course offerings and cost effectiveness. This study contributes to the evidence on charter schools in Philadelphia, but it cannot settle the issue, and we would encourage policymakers to collect a wider array of outcomes to fully assess the performance of charter schools and district schools in Philadelphia.

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Appendix A

Categories of Charter Schools Based on Mission Statements

The definitions and decision-criteria for each category of schools based on their missions are included in the accompanying chart. Our approach to creating these categories combined an inductive analysis of the mission statements and a review of the themes identified by Miron, Nelson, and Risley (2002). We initially identified the following themes to capture the range of goals in the charter school mission statements: Afro-Centric, provision of services to students and families, focus on at risk students, focus on community and parent involvement, focus on rigorous academics, a particular content focus, career and work focus.

The following themes were identified in the 2002 study by Miron et al: standards driven, college preparatory, science and technology, bilingual and bicultural, parent and community involvement, early intervention, at-risk students, preparation for work, and character education/community service/citizenship. Comparing our categories to those of Miron et al, we found that "College preparatory," "parent-community involvement," "at-risk students," and "career and work" originally appeared in both lists." In addition, we decided that some of the themes identified by Miron et al were useful additions. From Miron's list of core themes, we added "character education/community service/citizenship." We added "technology"(adapting Miron's category, not seeing a motivation for including science over other content areas.) We also combined at-risk students, early-intervention, and social services as one theme.

We originally identified a category of Afro-centric schools and a category of bilingual, bicultural schools. However there were not enough schools in any of these categories for use in the statistical analysis. Thus, we combined these schools to create a category of schools with the theme of "Cultural Heritage." Finally we created a category of "high standards" with the assumption that it might function as another indicator of schools' academic focus. We also added "2nd language" as another theme that has the potential to identify schools with a rigorous academic program.

COMMUNITY & FAMILY: Mission articulates commitment to improving/helping the school's families or community (does not include schools whose community involvement focuses on improving student outcomes).

CITIZENSHIP & CHARACTER DEVELOPMENT: Mission articulates commitment to helping students learn about citizenship, be productive community members, or develop their character or interpersonal skills.

CULTURAL HERITAGE: This category was originally defined by schools in which the mission statement includes a statement of an Afro-Centric (A) approach or a Hispanic bilingual-bicultural (b) approach.

SUPPORT FOR AT-RISK STUDENTS: Mission mentions serving at-risk students, providing social services, or providing early intervention.

SUPPORT FOR CAREER AND WORK: Mission statement includes a specific mention of career or employment.

COLLEGE PREP: Mission mentions specifically mentions college or "higher education." "Post-secondary education" not included in this category.

2nd LANGUAGE: Mission includes a commitment to teaching a 2nd language. Two English Spanish bi-lingual schools in this category are noted by (b).

HIGH STANDARDS: Mission includes use of the word "standards" (world-class standards, standards-based, etc.). Mention of standards-based instruction noted below.

TECHNOLOGY: Mission statement includes a mention of technology.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
TOTALS		46	20	50	47	44	45	49	45	38	Schools without this characteristic
TOTALS		11	37	7	10	13	12	8	12	19	Schools with this characteristic
Ad Prima Charter School	K-4		x		x						The mission of the Ad Prima Charter School is to educate the entire child by providing programs to children that enable them to become exemplary citizens distinguishable by their excellence in academic performance, social mores worthy of emulation, contagious positive attitude, noticeable high self-esteem, inclination to peaceful conflict resolution, effective communication skills, and commitment to community, brotherhood, and leadership by good example. These characteristics are nurtured through a caring community of learners including highly trained and competent school administrators and teachers, parents who are interested in their children's education and in the educational process, and other stakeholders who are committed to a more meaningful and practical approach to education as defined in the Ad Prima mission.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Alliance Charter	K-5	x			x					x	ALLIANCE CHARTER SCHOOL Mission Statement: The charter school, a subsidiary of Women's Christian Alliance, mission is to provide equal opportunities for children of the North Philadelphia community to learn by utilizing school resources equitably and providing adequate numbers of knowledgeable teachers in a safe, challenging and caring educational environment. The Charter School will work in conjunction with Women's Christian Alliance Community Family Center, which will provide comprehensive family preservation services and community revitalization activities to charter school students and their families. This partnering of services is founded in the belief that there is a reciprocal relationship between successful school and successful community. The WCA Charter School will be created around a science, mathematics and family life education in a technology rich learning environment.
Architecture and Design Charter School	9-12					x			x		ARCHITECTURE & DESIGN PUBLIC CHARTER SCHOOL Mission Statement: The mission of the Architecture and Design Public Charter School is to develop high standards and high expectations for all students in a challenging environment. This will be accomplished through interactive processes and visual learning experiences. The use of professionals in this field will create a consistent road to employment or future education. We will further endeavor to seek the enrollment of African Americans and Latino Americans, as these two groups are very underrepresented in the field of architecture.
Belmont Charter School	K-8	x	x		x						BELMONT CHARTER's mission is "to create intensive, high quality, individualized educational and social service programs for each child in order to promote the academic, social, and developmental growth of all students and the surrounding community." Our emphasis on early childhood intervention and the provision of family support further this mission, as do our developmentally appropriate curriculum, small class sizes, subject/grade-specific pullout/push-in sessions and individualized after-school tutoring program (among other strategies).
Center for Economics and Law	School closed					x					CENTER FOR ECONOMICS & LAW CHARTER SCHOOL Mission Statement: The mission of the Center for Economics and Law Charter School is to ensure that the children of Philadelphia will be given opportunities, experiences and academic preparation needed for employment and/or post secondary education upon graduation. Our curriculum will focus on economics, entrepreneurship and commerce and the interaction of law in these and other areas. Special attention will be afforded to the study of the emerging global economy and the effect on different cultures throughout the world and the United States. Parents, students, community and industry leaders will play and integral part in helping the school achieve this goal.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Christopher Columbus Charter School	K-8		x					x		x	CHRISTOPHER COLUMBUS CHARTER SCHOOL Mission Statement: It is the mission of the Christopher Columbus Charter School (CCCS) to provide students in grades K-3 a content-rich, academically rigorous Core Knowledge education with a well-defined, sequential curriculum in a safe, orderly, disciplined and caring environment. CCCS students will learn to express themselves in at least one international language, and will utilize computer technology to support learning in all major subjects and to become literate in the technologies of the 21st Century. The Christopher Columbus Charter School founders believe a literate citizenry is essential to the growth and strength of American democracy, and a quality public education is the most effective and equitable means toward this goal. In order for a truly democratic society to be created and perpetuated, our citizens need to be provided a common core of knowledge, developed in a safe, caring and disciplined environment which supports critical thinking and decision-making. The CCCS is committed to providing a free, academically rigorous and socially responsible educational program for students from kindergarten to grade three that will help every student regardless of background to succeed and to be a contributing member of society. By equipping our young people with a core of essential knowledge and skills, the CCCS will be helping to fulfill the dream of the Founding Fathers of this country, that all America's citizens will be able to pursue happiness and to achieve economic success.
Philadelphia Community Academy Charter School	K-12				x		x				COMMUNITY ACADEMY OF PHILADELPHIA CHARTER SCHOOL (Formerly Philadelphia Community Academy Charter School) Mission Statement: The Philadelphia Community Academy will be a project of The Community High School (Incorporated), a PA non-profit corp. [IRS 501 (c) (3)], extending the successful Community High School model to a college prep middle and high school, providing academics, medical care, social services, day care, and kindergarten for at-risk, inner city youth. The program is accredited by the Middle States Association of Colleges and Schools, Commission for Secondary Schools.
Discovery Charter School	K-8		x								DCS's mission is to engage students in an educational plan that builds from a prior knowledge base, is connected to discoveries outside the classroom and is supported by values of personal and community responsibility. The "look" of the school reflects its mission- from the breathtaking mosaic on the front facade to the wall murals inside that depict various modes of transportation to the creative street signs in the corridors, "streets" named by the students themselves.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Eugenio Maria DeHostos Community Bilingual Charter	K-3, 8	x	x	x(b)				x (b)		x	EUGENIO MARIA DeHOSTOS CHARTER SCHOOL Mission Statement: The mission of the Eugenio Maria DeHostos Community Bilingual Charter School (hereafter referred to as Hostos Charter School) is to promote excellence by providing middle level students a bilingual, bicultural academically enriched curriculum that draws from the social historical experience of Puerto Rico and Puerto Ricans living in the United States. This curriculum will provide all students a clear sense of their cultural identity, a critical approach to the history of Puerto Rico as part of the Americas and Caribbean, and they will develop a strong social change commitment to their community. The school will provide a rigorous curriculum that will fuse high technology with the arts and project-based instruction. We believe that school should be a place that is characterized by respect, critical thinking, democratic classrooms, and the vigorous challenges that are essential to maximize every student's potential. In addition, at the core of the Hostos Charter School is the unity and empowerment of the community, parents, students, teachers, and staff of the schools.
Family Charter School	K-4				x					x	FAMILY CHARTER SCHOOL Mission Statement: The Family Charter School is planned to provide intensive early intervention for children aged 3-8, as well as supports to the family members who impact their lives. For students to be ready and able to learn, teaching and learning must begin before students enter kindergarten and must be integrated with a broad range of supports and parental involvement, engage community organizations along with state and city services and coordinate the efforts made on behalf of children and their families, offer a developmentally appropriate curriculum which addresses the unique attributes of each child, provide continuity of instruction and family support through a longer school day and extended school year, and offer an enriched program of activities, in a small class setting. Including multicultural experiences, exposure to the arts and development of technology skills.
First Philadelphia Charter School for Literacy	K-6								x	x	FIRST PHILADELPHIA CHARTER SCHOOL FOR LITERACY Mission Statement: The First Philadelphia Charter School for Literacy believes that the cornerstone for effective learning is literacy. The founders' primary goal is that all students, after two years of regular attendance, will read at or above grade level. Improving reading abilities will in turn ensure that students in grades K-5 will meet or exceed national standards in language arts (including writing), mathematics, science, and technology. The founders plan to accomplish these goals through research-based practices including an intensive balanced literacy approach to reading and writing, year-round schooling, and involving the community through rich and substantive partnerships. These partnerships will include families, local and national business and industry, community organizations, and other groups and individuals committed to the quality of education in the community.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Folk Arts Cultural Treasures	K-6	x	x	x ³¹					x		The Folk Arts and Cultural Treasures (FACTS) Charter School is rooted in the philosophy that we, as scholastic leaders, should provide children with an academically strong education that fosters a love of learning and engages students through cultural awareness. Our mission is to unite children of diverse cultures and communities from various communities through a shared commitment to intellectual pursuits and academic integrity. FACTS offers our children a joyful place where they can learn to think critically and acquire a respect for culture and folk arts as they are powerful resources. As such, FACTS provides children with an exemplary education that utilizes traditional arts and cultures found within their own and neighboring communities as the catalyst for critical inquiry and community engagement. Based in Philadelphia's Chinatown community, FACTS extends to students an education founded on high academic standards and community reciprocity that incorporates and respects our students and their families. It is our goal to instill in our students a cultural and communal awareness that informs them of their role as active participants for a just society.
Franklin Towne Charter High School	9-12		x				x				FRANKLIN TOWNE CHARTER HIGH SCHOOL Mission Statement: Franklin Towne Charter High School, to be located in Northeast Philadelphia and serving grades 9-12, is comprised of several complementary strands. It is a school where students are invited to meet the challenges of a rich and rigorous college preparatory program, where opportunities for performance, applied, and service learning are integrated into the daily structure, and where choice and variety are maintained as genuine options. Moreover, the program incorporates meaningful service learning experiences and entrepreneurial learning into its offerings at every grade level. Greater variety and rigor in the academic program, in the form of the proposed International Baccalaureate curriculum, will offer talented students the external validation and rigorous challenge they need to feed their aspirations and ensure future success.

³¹ This category was originally defined as Afro-Centric and Bi-Lingual Bi-Cultural. Folk Arts Cultural Treasures has the theme of "Cultural Heritage," but was not classified this way for the statistical analyses.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Freire Charter School	8-12	x	x							x	FREIRE CHARTER SCHOOL Mission Statement: Freire Charter School gives young people complementary academic and applied opportunities in a small learning community that is shaped equally by individual goals and democratic ideals, and that provides an inclusive, supportive, respectful, demanding and joyous environment for students, their families, staff and community partners. The school builds on the insights of educator-philosopher Paolo Freire in connecting students' learning to family, home, workplace and community. The school will adopt principles of "mindfulness" developed by Harvard psychologist Ellen Langer and will incorporate active learning methods from the work of research-practitioner Eric Rofes. To ensure ongoing dialogue among school, home and mentors, and shared learning activities for students and families, the school will make computer technology and Internet access available to every student and family. Students (and families and staff) will develop personal education plans that take their interests and lifelong learning goals into account. Students graduate with their own well-researched plans that are rooted in rigorous academic learning, systematic service, career and entrepreneurial experiences and reflection.
Germantown Settlement	5-8		x						x		GERMANTOWN SETTLEMENT CHARTER SCHOOL Mission Statement: The Germantown Settlement Charter School will help prepare 512 students in grades 5 to 8 for civic leadership through a rigorous academic program that approaches world class standards. Civic leadership, social development and multicultural understanding are also critical goals. The educational program will be based on the MicroSociety model, which features learning through simulations of institutions, such as businesses and legislatures, and real-world experiences. Additionally, the school will encourage parental involvement at all levels of the educational program and will develop a strong network of supports for the children and their families.
Green Woods Charter School	K-8		x								The mission of GREEN WOODS CHARTER SCHOOL is to provide children in grades K through 8 with the opportunity to be active, knowledgeable and conscientious young investigators by fostering a keen understanding of the interrelatedness and interdependence of our local and global existence.
Harambee Institute of Science and Technology Charter School	K-8	x	x	x (A)						x	HARAMBEE INSTITUTE OF SCIENCE TECHNOLOGY CHARTER SCHOOL Mission Statement: Our mission is to create a charter school of science and technology that is in accordance with the State Department of Education and the Philadelphia School District's ongoing effort to reorganize the delivery of educational services. Furthermore, Harambee Institute will work to establish itself as a center for community-based programs. Within this framework, the outcome of Harambee Institute and its community programs will focus on building self-respect, self-reliance, and empowerment through practical, educationally sound and culturally relevant curricula and services. The partners and beneficiaries of Harambee Institute education and related services will be the students, their families, teachers and the West Philadelphia community.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Hope Charter School	9-12				x						HOPE CHARTER SCHOOL (Conditionally granted a charter to open in September 2002) Mission Statement: HOPE Charter School is an at-risk youth high school program designed to meet the needs of students who are not currently succeeding in their conventional high school or attending sporadically, and/or may be in danger of leaving school prior to their graduation. The school will provide an environment designed to meet the comprehensive needs of these at risk students by utilizing small learning groups and interaction with a multi-disciplinary staff that is trained and committed to successfully educating each one of these students.
Imani Education Circle	K-8	x	x	x (A)						x	IMANI EDUCATION CIRCLE CHARTER SCHOOL Mission Statement: The Imani Education Circle Charter School (IEC) will provide students in grades K-8 an academically rigorous, mathematics, science and technology-intensive program in a safe and caring environment. Imani will address the needs of students, their families and their communities by building on the strength of students' cultural heritage and life experiences to enable them to become successful, lifelong learners, and valuable members of the global community. Educational Vision: The Imani Education Circle Charter School (IEC) will be an African-centered elementary school (K-8) that will involve members of students' families and communities as partners in the circle of education, both inside and outside the classrooms. IEC will draw on the strengths of its surrounding community to assist the entire family in finding the services and supports they will need to become active contributory members of their community.
Imhotep Charter	9-12		x	x					x		IMHOTEP CHARTER SCHOOL Mission Statement: The Imhotep Institute is an African-Centered, Science, Mathematics, and Technology based Twilight High School. The mission is to provide an instructional program for high school students that focuses on high academic standards and character development. The Institute will use a standards-driven constructivist approach of teaching and learning. The vision is to have graduates of Imhotep Institute become successful, lifelong learners, and valuable members of the world community.
Independence Charter School	K-8							x			INDEPENDENCE CHARTER SCHOOL (Charter granted by the State Charter Appeal Board) Mission Statement: The defining feature of the Independence Charter School is its emphasis on music, arts, history, and geography of cultures and countries throughout the world. These themes will be implemented across the curriculum to give students as appreciation for a wide range of world cultures and languages. A key element of the school is a commitment to second language acquisition, and indeed fluency in Spanish for all students. In keeping with its focus, the program will include an optional language immersion program.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Khepera Charter School	K-8		x	x(A)							Khepera Charter School's mission is to create exceptional learners and leaders by closing the academic achievement gap attributed to race, gender and economic class. In keeping with this mission Khepera utilizes the culture and history of its students to inspire a commitment to excellence in character, in scholarship, and in citizenship. Khepera Charter School stresses excellence in scholarship and gives particular attention to building capacities in the critical literacies of language arts, numeracy, science, and technology. Excellence in character is cultivated through the use of traditional African and African American value systems. Excellence in citizenship is developed through service to family, community, the environment, and the world.
KIPP Philadelphia Charter School	5-8		x				x				The mission of KIPP Philadelphia Charter School is to develop the character, knowledge and skills of our students so they will succeed in top-quality high schools, colleges, and the competitive world beyond.
Laboratory of Communication and Languages Charter School	K-8							x		x	LABORATORY CHARTER SCHOOL OF COMMUNICATIONS & LANGUAGES Mission Statement: The mission of the Laboratory Charter School of Communications & Languages is to provide a comprehensive, cognitively based program that will prepare students to communicate effectively in more than one world language and to see the world from global, international and national perspectives. The school will promote: 1) excellence in oral and written communication, 2) mastery of at least two world languages, 3) familiarity with communication technologies, 4) appreciation of cultural diversity, 5) concern for international and global issues, and 6) commitment to lifelong learning. It will be characterized by excellence in teaching, instructional methodologies that connect learning to pragmatic conditions, and close cooperation among communities, parents, and teachers.
Leadership Learning Charter	K-8	x	x								LEADERSHIP LEARNING PARTNERS CHARTER SCHOOL (Charter granted by the State Charter Appeal Board) Mission Statement: Leadership Learning Partners Charter School's purpose is to open portals of opportunity for children and adults in the community through excellence in public education. The school will serve as a community pillar for life-long learning, pride, and self-actualization.
Mariana Bracetti Academy Charter School	6-12		x							x	MARIANA BRACETTI ACADEMY CHARTER SCHOOL Mission Statement: The Mariana Bracetti Academy Charter School will be a local institution of high achievement - a math, science and technology focused on middle and high school for children from West Kensington and across Philadelphia. The school will have a strong performance culture in which innovative teaching strategies, effective use of data and assessment and use of technology will support accelerated learning. The school will produce graduates prepared to be leaders with not only the academic preparation to succeed but the broader set of characteristics required to lead in the 21st Century.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Maritime Academy Charter High School	5-11					x	x	x		x	The MARITIME ACADEMY CHARTER HIGH SCHOOL (MACHS) provides students in grades 5 through 12 a rigorous academic program with a central theme of maritime studies. MACHS' students participate actively in hands-on learning experiences that involve them directly in maritime activities and strengthen their preparation for college and careers, including those associated with the nation's intermodal transportation system. MACHS works to prepare students for leadership roles in the nation's commercial transportation systems. Students work with the latest technology to learn maritime content such as nautical science and maritime business, while achieving to high standards in English, Mathematics, Science, Social Studies and the Arts.
Mastery Charter - Lenfest	9-12		x				x				Our mission is: All students learn the academic and personal skills they need to succeed in higher education, compete in the global economy, and pursue their dreams.
Mastery Charter at Shoemaker	7-8		x				x				Our mission is: All students learn the academic and personal skills they need to succeed in higher education, compete in the global economy, and pursue their dreams.
Mastery at Thomas Charter	7-9		x				x				Our mission is: All students learn the academic and personal skills they need to succeed in higher education, compete in the global economy, and pursue their dreams.
MAST /Math, Science, and Technology	K-12								x	x	MATH, SCIENCE & TECHNOLOGY COMMUNITY CHARTER SCHOOL Mission Statement: The educational focus is on teaching world-class standards with a focus on math, science and technology through a consistent pathway (K-12) for student learning and development. Curriculum will be integrated and constructivist. Teaching and learning will be based in ATLAS principles with a strong emphasis on core competencies. Although the first year may open at one site, the vision is to establish multiple learning sites at colleges and businesses.
Mathematics, Civics and Sciences Charter School	1-12		x		x	x					MATHEMATICS, CIVICS AND SCIENCES CHARTER SCHOOL Mission Statement: The mission of the Math, Civics and Sciences Charter School of Philadelphia is to provide quality education and intervention to children classified as at-risk. We believe that all children can learn at high levels, but we recognize that all children have varied learning styles. Our educational process will include positive role models, respect, love, individual attention, and a reward system for success. Our school will address basic skill deficiencies and accelerate the development of advanced academic performance in mathematics, citizenship and the sciences. Our non-academic program will be specifically designed to provide students with the essential social skills to achieve in today's economic work place as well as in the community.
Delaware Valley Charter High School	9-12					x					Delaware Valley Charter High School Mission Statement: Delaware Valley Charter High School offers a school-to-career program that is supported by a rigorous academic curriculum. Graduates will be prepared to make a seamless transition from high school to a chosen career or further education.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Multi-Cultural Academy	9-12		x		x	x	x	x	x	x	MULTI-CULTURAL ACADEMY CHARTER SCHOOL Mission Statement: The mission of the Multi-Cultural Academy Charter School (MACS) is to provide to its students regardless of their race, sex, educational or cultural background a quality and equitable education. This education is necessary for students to become contributing members of society. MACS education will be aimed at the holistic development of each individual student. It will be based on a multi-faceted, standards-driven curriculum that promotes academic excellence and at the same time meets the student's educational needs and aspirations. The purpose of this charter school is to help its students obtain a high school diploma and prepare them for higher education and the world of work. MACS will be a community-based and student-oriented charter school established to meet the unusual challenge of educating multi-cultural students and those most at-risk of failure, grades 9-12, with a focus on English as a second language (ESL). Instruction will be supported by the extensive use of technology, parental involvement and bilingual tutoring/mentoring services.
New Foundations Charter School	K-8		x								NEW FOUNDATIONS CHARTER SCHOOL Mission Statements: The mission of the New Foundations Charter School is to provide students with the academic, social, and emotional foundations and skills necessary to become high achieving, socially competent stewards of their communities. The founders of New Foundations Charter School will ensure a commitment to lifelong learning and achievement of all our students by creating an atmosphere of caring that pervades every aspect of school life, and promotes attachment to and responsibility for all members of our school community.
New Media Tech Charter School	5-11		x							x	The central mission of New Media Technology Charter School is to provide students with rigorous and relevant academic and life skills, prepare its graduates to use technology, and to enhance lifelong learning and productivity.
Northwood Academy Charter School	K-7		x								Northwood Academy Charter School will focus on student welfare and student learning. All instruction will center on the core values of independence, integrity and academic excellence. Northwood Academy Charter School will meet the educational needs of all its students, excepting none. Students at all levels will engage their intellects to develop critical thinking and problem solving skills allowing them to compete in a global arena. Our teachers will provide the tools to make our students standouts amongst their peers. Northwood Academy Charter School will facilitate learning the importance of collaboration in the classroom, the school, the community and the world in a safe, nurturing environment. This will be achieved through instruction and demonstration of those skills necessary for successful integration into society regardless of race, gender, creed or exceptionality. Northwood Academy Charter School will send forth its students imbued with the knowledge, confidence and ability to succeed both academically and socially.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Nueva Esperanza Academy Charter School	9-12		x	x(b)				x (b)		x	NUEVA ESPERANZA ACADEMY CHARTER SCHOOL Mission Statement: The Nueva Esperanza Academy Public Charter School is dedicated to providing a quality education that prepares critically thinking, socially capable, spiritually sensitive, and culturally aware young adults who can use English, Spanish, and technology as tools for success in the 21st century.
People for People Charter School	K-8	x	x			x					PEOPLE FOR PEOPLE CHARTER SCHOOL Mission Statement: The People for People Charter School's focus will be the students' roles as active participants in their community, with emphasis on providing a strong, vibrant educational experience in which the fundamentals of entrepreneurship will be integrated into all grades and subject areas. Students will master basic skills at a high level of competence while acquiring knowledge and skills in problem solving and decision making as spenders, investors, borrowers, and managers of money. Economic, career, and community education will be stressed at all levels. The school will interact closely with the many community-based programs and services provided by People for People, Inc. for North Philadelphia residents.
Philadelphia Academy	K-12									x	PHILADELPHIA ACADEMY CHARTER SCHOOL Mission Statement: The Philadelphia Academy Charter School, named for Ben Franklin's school, will provide our ethnically, culturally, and racially diverse K through 8th grade citizens of the world a safe, healthy, stimulating learning community built upon a broad-based continuum of programs undergirded by technology and linked together by the acquisition of language, by an appreciation for a level of comfort with the dramatic, performing, and visual arts, by valuing the importance of physical and mental health, and by an understanding of world geography and world affairs. It is our mission to offer our citizens the best education in the world!
Philadelphia Electrical & Technology Charter School	9-12					x				x	PHILADELPHIA ELECTRICAL AND TECHNOLOGY CHARTER SCHOOL (Conditionally granted a charter to open in September 2002) Mission Statement: The mission of the International Brotherhood of Electrical Workers, Union Local 98, Skilled Trades & Technology Charter School is to develop in students skills in the emerging high-tech industries, while giving students a strong foundation in the core academic subjects-math, science, language arts and social studies. Recognizing the fast-growing, ever-changing, technology that will affect our home and work lives in the 21st century, the school will teach and emphasize the emerging high-tech skills necessary for the construction, telecommunications, and related industries that are at the forefront of the Information Age.
Philadelphia Montessori Charter	PreK-4		x								The mission of the PHILADELPHIA MONTESSORI CHARTER SCHOOL is to provide early childhood and elementary school children in inner-city Philadelphia with a comprehensive, developmentally appropriate Montessori education that will enable them to become young adults possessing strong self-discipline, independent and analytical thinking skills, and an enduring love of learning. By the time students leave us at age twelve, they will be accomplished readers, skilled researchers and will be able to apply math skills to solve real world problems.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Philadelphia Performing Arts Charter School	K-8							x	x		PHILADELPHIA PERFORMING ARTS CHARTER SCHOOL Mission Statement: The founding coalition of the Philadelphia Performing Arts Charter School consists of parents, community residents, artists, educators and business people, who have come together because they believe that every child has gifts and talents which must be discovered and nurtured, so that each student will meet or exceed world-class standards, both academically and in the arts. In order to accomplish this mission, we will offer a comprehensive educational program which emphasizes equally academic and artistic excellence. Every child will be given instrumental music and dance instruction; every child will learn a second language; and every child will be offered additional performing and creative arts learning opportunities.
Preparatory Charter School of Mathematics, Science & Technology & Careers Charter	9-12		x			x	x		x	x	PREPARATORY CHARTER SCHOOL OF MATHEMATICS, SCIENCE, TECHNOLOGY & CAREERS Mission Statement: The Preparatory Charter School of Mathematics, Science, Technology and Careers (PCS) will provide a nurturing and challenging atmosphere in which students in grades nine through twelve will acquire the knowledge and experience they need to prepare them for college and for productive and fulfilling lives in their communities. The PCS will simultaneously help its students to achieve to high academic standards and to develop essential career skills, while giving them extensive experiences in service to their community.
Raising Horizons Quest Charter School	K-8		x								RAISING HORIZONS QUEST CHARTER SCHOOL Mission Statement: Raising Horizons Quest Charter School is a proposed kindergarten through eighth grade school design focusing on aeronautics/aerospace education and creative leadership. The school's mission is two-fold: (1) to provide a solid educational program developed through the study of aerospace/aviation and, (2) to develop creative leaders who will not follow a path, but who will become trailblazers for the 21st century.
Renaissance Advantage	K-8		x						x		RENAISSANCE ADVANTAGE CHARTER SCHOOL Mission Statement: The mission of the Renaissance Advantage Charter School is to demonstrate the heights of academic achievement that students can routinely attain when the advantages of charter school governance are coupled with ambitious academic standards and proven curricula and instructional methods. The school will have a strong academic focus and will emphasize character education.
Renaissance Charter School	6-8									x	RENAISSANCE CHARTER SCHOOL Mission Statement: The Renaissance Charter School is an independent community-managed public school. The Renaissance Charter School is designed to help students make dramatic gains in their achievement through a rigorous academic program focused in the sciences, technology and fine arts.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
Richard Allen Prep Charter School	5-8	x	x			x	x				RICHARD ALLEN PREPARATORY CHARTER SCHOOL Mission Statement: The mission of the Richard Allen Preparatory Charter School is to create a safe and healthy learning environment that will nurture, motivate and enable our middle school youth to develop into mindful, responsible, contributing participants in their education, their community, and the diverse society in which we live. Our program is characterized by the cooperative presence and unified support of caring families, businesses, and educational and civic groups with whom our students will interact. Our program of performance-based instruction will guide students through the development of creative and critical thinking and learning skills which they will learn to apply to daily living through cooperative, interactive, and reality-based instruction in the core curriculum areas. We commit to guiding all of our students toward the acquisition of those skills and qualities necessary to become successful, lifelong learners. Through the Constructivist approach to learning, nurtured by family and supported by the community, our students will be able to participate in opportunities for higher learning, success in the workplace, and rich and fulfilling family and community life.
Russell Byers Charter School	PreK-6		x			x					RUSSELL BYERS CHARTER SCHOOL (Conditionally granted a charter to open in September 2001) Mission Statement: The Russell Byers Charter School will provide a rigorous education that cultivates self-assurance, love of fresh ideas, and especially, a sense of joy. Its students will be knowledgeable and responsible citizens, creative problem solvers, and powerful communicators. They will acquire the academic and career skills that will allow them to truly make their lives and their world better.
Universal Institute	K-8	x	x		x	x					UNIVERSAL INSTITUTE CHARTER SCHOOL Mission Statement: The Universal Institute Charter School will provide a School To Career academic program that emphasizes self sufficiency, civic responsibility and problem solving through mathematics, language arts, and the sciences. The program will provide direct services and linkages to community resources that support student/family growth and self-sufficiency. UICS is a component of Universal Community Homes comprehensive neighborhood revitalization strategy.
Wakisha Charter School	6-8		x	x (A)					x		WAKISHA CHARTER SCHOOL Mission Statement: The Wakisha Charter School, in partnership with families and the neighboring community, endeavors to provide its students with a sound basis for life-long learning and success. This foundation is established by nurturing the transformation of each student from middle school learner to self-sufficient, informed, confident, responsible, productive citizen. Wakisha Charter School students engage an academically rigorous, all-inclusive, standards-driven, African centered curriculum. Dedicated to seeking excellence in all aspects of their own development, Wakisha Charter School students model the principles of character education and cultivate their innate entrepreneurial spirits in a hurt-free environment where learning is challenging, enjoyable and stimulating.

SCHOOL	06-07 GRADE LEVEL	COMMUNITY & FAMILY	CITIZENSHIP & CHARACTER DEVELOPMENT	CULTURAL HERITAGE	SUPPORT FOR AT-RISK STUDENTS	SUPPORT FOR CAREER AND WORK	COLLEGE PREP	2nd LANGUAGE	HIGH STANDARDS	TECHNOLOGY	--MISSION--
West Oak Lane Charter	K-8		x								WEST OAK LANE CHARTER SCHOOL Mission Statement: The West Oak Lane Charter School mission is to empower the children of West Oak Lane and surrounding communities to become the future leaders of Philadelphia through the best practices in elementary education in a safe, structured, and supportive environment.
West Philadelphia Achievement Charter Elementary School	K-5										WEST PHILADELPHIA ACHIEVEMENT CHARTER ELEMENTARY SCHOOL (Conditionally granted a charter to open in September 2002) Mission Statement: "Too often schools have treated the arts as if they were incidental...The arts are not incidental-they are central to our existence...and to a higher sense of purpose." Harry Belafonte, October 6, 2000. Mr. Belafonte's words embody the core philosophy of the founders of West Philadelphia Achievement Charter Elementary School. The three most salient features of the school are: a partnership with the Galef Institute's Different Ways of Knowing, a partnership with Temple University's Center for Intergenerational Learning, and an extended school year providing 185 days and 1,110 hours of instruction.
Wissahickon Charter School	K-8		x								WISSAHICKON CHARTER SCHOOL (Conditionally granted a charter to open in September 2002) Mission Statement: Wissahickon Charter School, to be located in Philadelphia, will serve 400 students in grades K-8. Using the substantial environmental assets of the Wissahickon Valley and a variety of community resources, the school will focus on academic achievement and social development through integrated environmental studies and service learning opportunities. Parent participation in the instructional activities of their children will be emphasized, as will developing the capacity in all students to work cooperatively with others, and to resolve conflicts with appropriate and acceptable interpersonal strategies.
World Communications Charter School	6-12					x	x		x		WORLD COMMUNICATIONS CHARTER SCHOOL Mission Statement: The mission of the World Communications Charter School is to guarantee that our students meet world class academic standards, command adequate communication skills and possess levels of competence required for pursuits in higher education or gainful employment. The WCCS is a corporate/family investment in the future managed by capable education professionals.
Young Scholars	6-8						x				YOUNG SCHOLARS CHARTER SCHOOL Mission Statement: The school will provide a nurturing, accelerated educational environment to prepare its students for the challenge of rigorous pre-college programs.
YouthBuild Charter School	12				x						YOUTHBUILD CHARTER SCHOOL (Formerly YouthBuild Philadelphia Charter School) Mission Statement: The mission of the YouthBuild Philadelphia Charter School is to provide the highest level of opportunities for inner city youth who have not been successful in traditional school settings.
TOTALS		46	20	50	47	44	45	49	45	38	Schools without this characteristic
TOTALS		11	37	7	10	13	12	8	12	19	Schools with this characteristic

Appendix B

Regression Results

Below, we provide a more detailed description of the regression results including sample size, the values for the R-squared, and estimates for control variables. For the sake of space, we have excluded the coefficient and standard error estimate for the grade-by-year interactions.

Table B-1: Detailed Results for Table 3

Variable	Overall Estimate Model		Estimates by Year Model		Estimate by Race/Ethnicity Model	
	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)
Overall estimate for charter schools	-0.03 (0.02)	-0.03 (0.02)				
Attending a charter school one year			-0.06* (0.03)	-0.02 (0.02)		
Attending a charter school two years			0.01 (0.02)	0.00 (0.02)		
Attending a charter school three or more years			-0.01 (0.02)	0.01 (0.02)		
Attending a charter school unknown number of years			-0.16* (0.03)	-0.15* (0.03)		
African American Students					-0.05 (0.02)	-0.03 (0.02)
Hispanic Students					0.01 (0.04)	0.00 (0.02)
White Students					-0.03 (0.03)	-0.04 (0.03)
Other Students					-0.01 (0.05)	0.03 (0.06)
Transferring to a New School	-0.10* (0.01)	-0.08* (0.01)	-0.10* (0.02)	-0.08* (0.01)	-0.10* (0.01)	-0.08* (0.01)
Constant	1.81* (0.08)	0.74* (0.06)	1.81* (0.08)	0.74* (0.06)	1.81* (0.08)	0.74* (0.06)
Number of observations	547,372	582,884	547,372	582,884	547,372	582,884
R-Squared	0.26	0.22	0.26	0.22	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-2: Detailed Results for Table 4

Variable	Estimates by Age Model		Estimates by Grade Arrangement Model	
	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)
Attending a Charter School in the Schools First Three Years of Operation	-0.04 (0.04)	-0.02 (0.03)		
Attending a Charter School after the School has been in Operation for At Least Four Years	-0.03 (0.02)	-0.03 (0.02)		
Attending a Charter High School			0.07* (0.02)	0.08* (0.03)
Attending a Charter Primary School (K-8 School)			-0.09* (0.03)	-0.08* (0.02)
Transferring to a New School	-0.10* (0.01)	-0.08* (0.01)	-0.10* (0.01)	-0.08* (0.01)
Constant	1.81* (0.08)	0.74* (0.06)	1.82* (0.08)	0.74* (0.06)
Number of observations	547,373	582,877	547,372	582,884
R-Squared	0.26	0.22	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-3: Detailed Results for Table 5

Variable	Math Coefficient (Robust Standard Errors)	Reading Coefficient (Robust Standard Errors)
African American Students Attending a Charter High School	0.09* (0.03)	0.09* (0.03)
White Students Attending a Charter High School	-0.03 (0.06)	-0.11 (0.08)
Hispanic Students Attending a Charter High School	0.03 (0.05)	0.04 (0.05)
Other Students Attending a Charter High School	0.11 (0.06)	0.19* (0.08)
African American Students Attending a Charter Primary School (K-8 School)	-0.10* (0.03)	-0.08* (0.02)
White Students Attending a Charter Primary School (K-8 School)	-0.09 (0.08)	-0.11 (0.07)
Hispanic Students Attending a Charter Primary School (K-8 School)	0.00 (0.07)	-0.03 (0.05)
Other Students Attending a Charter Primary School (K-8 School)	-0.06 (0.06)	-0.05 (0.07)
Transferring to a New School	-0.10* (0.01)	-0.08* (0.01)
Constant	1.82* (0.08)	0.74* (0.06)
Number of observations	547,372	582,884
R-Squared	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-4: Detailed Results for Table 6

Variable	Model Estimating Effects for Community and Family Schools		Model Estimating Effects for Character Development Schools		Model Estimating Effects for Cultural Heritage Schools	
	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)
Students Attending a Community and Family Charter School	-0.11* (0.04)	-0.08* (0.02)				
Students Attending a Citizen and Character Development Charter School			-0.02 (0.03)	-0.03 (0.02)		
Students Attending a Cultural Heritage Charter School					-0.07 (0.04)	-0.06 (0.05)
Transferring to a New School	-0.11* (0.01)	-0.08* (0.01)	-0.10* (0.01)	-0.08* (0.01)	-0.11* (0.01)	-0.08* (0.01)
Constant	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)
Number of observations	547,373	582,877	547,373	582,877	547,373	582,877
R-Squared	0.26	0.22	0.26	0.22	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-4 (continued): Detailed Results for Table 6

Variable	Model Estimating Effects for At-Risk Schools		Model Estimating Effects for Career and Work Schools		Model Estimating Effects for College Prep Schools	
	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)
Students Attending a Charter School Providing Support to At-Risk Students	-0.03 (0.03)	-0.01 (0.02)				
Students Attending a Charter School Providing Support for Career and Work			-0.02 (0.04)	0.01 (0.03)		
Students Attending a College Prep Charter School					0.01 (0.04)	0.02 (0.03)
Transferring to a New School	-0.11* (0.01)	-0.08* (0.01)	-0.11* (0.01)	-0.08* (0.01)	-0.11* (0.01)	-0.08* (0.01)
Constant	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)
Number of observations	547,373	582,877	547,373	582,877	547,373	582,877
R-Squared	0.26	0.22	0.26	0.22	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-4 (continued): Detailed Results for Table 6

Variable	Model Estimating Effects for Second Language Schools		Model Estimating Effects for High Standards Schools		Model Estimating Effects for Technology Schools	
	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)	Math (Robust Standard Errors)	Reading (Robust Standard Errors)
Students Attending a Charter School with a Focus on Second Language	0.00 (0.04)	0.01 (0.04)				
Students Attending a High Standards Charter School			-0.03 (0.03)	-0.04 (0.03)		
Students Attending a Technology Charter School					0.00 (0.03)	-0.01 (0.02)
Transferring to a New School	-0.11* (0.01)	-0.08* (0.01)	-0.11* (0.01)	-0.08* (0.01)	-0.11* (0.01)	-0.08* (0.01)
Constant	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)	1.81* (0.08)	0.73* (0.06)
Number of observations	547,373	582,877	547,373	582,877	547,373	582,877
R-Squared	0.26	0.22	0.26	0.22	0.26	0.22

* Indicates statistical significance at the 5 percent level.

Table B-5: Detailed Results for Competitive Analysis Using Distance to Nearest Charter School and the Number of Charter Schools Within 2.5 Miles as a Competitive Proxy

	Distance to Nearest Charter School Analysis		Number of Charter Schools Within 2.5 Miles Analysis	
	Distance to nearest charter school	0.01 (0.06)	0.06 (0.05)	
Number of charter schools within 2.5 miles			0.01 (0.02)	0.00 (0.01)
Constant	1.87* (0.15)	0.76* (0.11)	1.76* (0.20)	0.79* (0.15)
Number of observations	478,049	509,140	478,049	509,140
R-Squared	0.50	0.44	0.50	0.44

* Indicates statistical significance at the 5 percent level.

Appendix C

Racial/Ethnic Makeup of “Switching” Students Relative to All Charter Students

Racial/Ethnic Percentages	“Switchers”	All Students Ever Attending a Charter School
Percent Black	72.7	67.6
Percent White	10.5	16.6
Percent Hispanic	14.8	13.1
Percent Other	1.9	2.7

Appendix D

Details for Calculating Mobility Rates

To compute the transfer rate, students were first sorted by year. Following the student over time, changes in the school number during the school year or at the beginning of the following year were identified. These changes were considered transfers unless the student left a school at the end of the school year, completing the highest grade offered at the school (i.e. they had graduated). These structural changes were not included in any of the transfer rates.

Only public schools and charter schools were included in the analysis. Schools not assigning grades were removed from the analysis as it was not possible to determine whether a transfer was a structural or non-structural change. These schools were pre-K programs and approved private schools. Student-years with no grade (“NG”) assigned were also removed from the analysis. These observations were mainly students enrolled in special education or disciplinary programs.