

Charter School Performance in New Jersey

11/1/2012



Table of Contents

Introduction	5
Study Approach	7
New Jersey Charter School Demographics	11
Overall Charter School Impact	15
Charter School Impact by Year	18
Charter School Impact by Location	19
Charter School Impact by School Level	20
Charter School Impact by Age of Charter and Students' Years of Enrollment	21
Charter School Impact with Race/Ethnicity	23
Charter School Impact with Students in Poverty.....	25
Charter School Impact with Race/Ethnicity and Students in Poverty	26
Charter School Impact with Special Education Students	27
Charter School Impact with English Language Learners	28
Charter School Impact with Grade-Repeating Students	29
Charter School Impact by Student's Starting Decile.....	30
School-level Analysis	33
Synthesis and Conclusions	36
Appendix	40

Table of Figures

Figure 1: CREDO Virtual Control Record Methodology	8
Figure 2: Opened and Closed Charter Campuses, 1997-2011	11
Figure 3: New Jersey Charter School Locations	12
Figure 4: Average Learning Gains for Students in New Jersey Charter Schools Compared to Gains for VCR Students in Each Charter Schools' Feeder TPS in 2008-2011	16
Figure 5: Impact by Growth Period, 2008-2011	18
Figure 6: Impact by School Location.....	19
Figure 8: One-Year Average Learning Gains by Age of Charter School	21
Figure 9: Impact by Students' Years of Enrollment	22
Figure 10: Impact with Black and Hispanic Students.....	24
Figure 11: Impact with Students in Poverty.....	25
Figure 12: Impact with Black and Hispanic Students in Poverty.....	26
Figure 13: Impact with Special Education Students	27
Figure 14: Impact with English Language Learners.....	28
Figure 15: Impact with Grade-Repeating Students	30
Figure 16: Impact by Students' Starting Decile – Reading	31
Figure 17: Impact by Students' Starting Decile – Math	31

Table of Tables

Table 1: Demographic Comparison of Students in TPS, Feeders and Charters	13
Table 2: Demographic Composition of Charter Students in the Study.....	14
Table 3: Transformation of Average Learning Gains.....	17
Table 4: Performance of Charter Schools Compared to Their Local Markets	34
Table 5: Reading Growth and Achievement	35
Table 6: Math Growth and Achievement	36
Table 7: Summary of Statistically Significant Findings for Average Learning Gains of New Jersey Charter School Students Compared to the Average Learning Gains for VCR Students.....	38

Introduction

Across the country, charter schools occupy a growing position in the public education landscape. Heated debate has accompanied their existence since their start in Minnesota two decades ago. Similar debate has occurred in New Jersey as well, with charter advocates extolling such benefits of the sector as expanding parental choice and introducing market-based competition to education. Little of that debate, however, is grounded in hard evidence about their impact on student outcomes. This report contributes to the discussion by providing evidence of charter students' performance in New Jersey for five years of schooling, beginning with the 2006-2007 school year and concluding in 2010-2011.

With the cooperation of the New Jersey Department of Education, CREDO obtained the historical sets of student-level administrative records. The support of NJ DOE staff was critical to CREDO's understanding of the character and quality of the data we received. However, it bears mention that the entirety of interactions with the Department dealt with technical issues related to the data. CREDO has developed the findings and conclusions independently.

This report provides a first-ever in-depth examination of the results for charter schools in New Jersey. It is also CREDO's first attempt to analyze the performance of New Jersey's charter schools, as their data was not made available to us for inclusion in the CREDO national charter school study from 2009.¹ This report has two main benefits. First, it provides a rigorous and independent view of the state's charter schools. Second, the study design is consistent with CREDO's reports on charter school performance in other locations, making the results amenable to being benchmarked against those nationally and in other states.

The analysis presented here takes two forms. We first present the findings about the effects of charter schools on student academic performance. These results are expressed as the results that a typical charter school student in New Jersey would realize. The second set of findings is presented at the school level. Because schools are the instruments on which the legislation and public policy works, it is important to understand the range of performance for the schools. These findings look at the performance of students by school and present school average results.

Compared to the educational gains that charter students would have had in a traditional public school (TPS), the analysis shows that students in New Jersey

¹ CREDO. *Multiple Choice: Charter School Performance in 16 States* (2009). <http://credo.stanford.edu>

charter schools on average make larger learning gains in both reading and mathematics. At the school level, 30 percent of the charter schools have significantly more positive learning gains than their TPS counterparts in reading, while 11 percent of charter schools have significantly lower learning gains. In math, 40 percent of the charter schools studied outperform their TPS peers and 13 percent perform worse. These school-level results are notably more positive than the analogous pattern presented in the 2009 report.

Study Approach

This study of charter schools in New Jersey focuses on the academic progress of their enrolled students. Whatever else charter schools may provide their students, their contributions to their students' readiness for secondary education, high school graduation and post-secondary life remains of paramount importance. Indeed, if charter schools do not succeed in forging strong academic futures for their students, other outcomes of interest, such as character development or non-cognitive skills, cannot compensate. Furthermore, current data limitations prevent the inclusion of non-academic outcomes in this analysis.

This statewide analysis uses the Virtual Control Record (VCR) methodology that has been used in previous CREDO publications.² The approach is a quasi-experimental study design with matched student records that are followed over time. The current analysis examines whether students in charter schools in New Jersey outperform their traditional public school (TPS) counterparts. The current analysis begins with the general question of whether in the aggregate students in charter schools outperform their TPS counterparts. This general question is then extended to consider whether the observed charter school performance is consistent when the charter school population is disaggregated along a number of dimensions, such as race/ethnicity, geographic location and so on. Answers to all these questions require that we ensure that the contribution of the schools – either the charter schools or the TPS schools – is isolated from other potentially confounding influences. For this reason, these analyses include an array of other variables whose purpose is to prevent the estimate of charter schooling to be tainted by other effects. In its most basic form, the analysis included controls for student characteristics: standardized starting score, race/ethnicity, special education and lunch program participation, English proficiency, grade level, and repeating a grade.

To create a reliable comparison group for our study, we attempted to build a VCR for each charter school student. A VCR is a synthesis of the actual academic experience of students who are identical to the charter school students, except for the fact that they attend a TPS that the charter school students would have attended if not enrolled in their charter school. We refer to the VCR as a 'virtual twin' because it takes the experience of multiple 'twins' and creates a single

² CREDO. *Multiple Choice: Charter School Performance in 16 States* (2009). Davis, Devora H. and Margaret E. Raymond. Choices for Studying Choice: Assessing Charter School Effectiveness Using Two Quasi-experimental Methods. *Economics of Education Review* 31, no. 2 (2012): 225-236. For the interested reader, links to these reports are available at <http://credo.stanford.edu>.

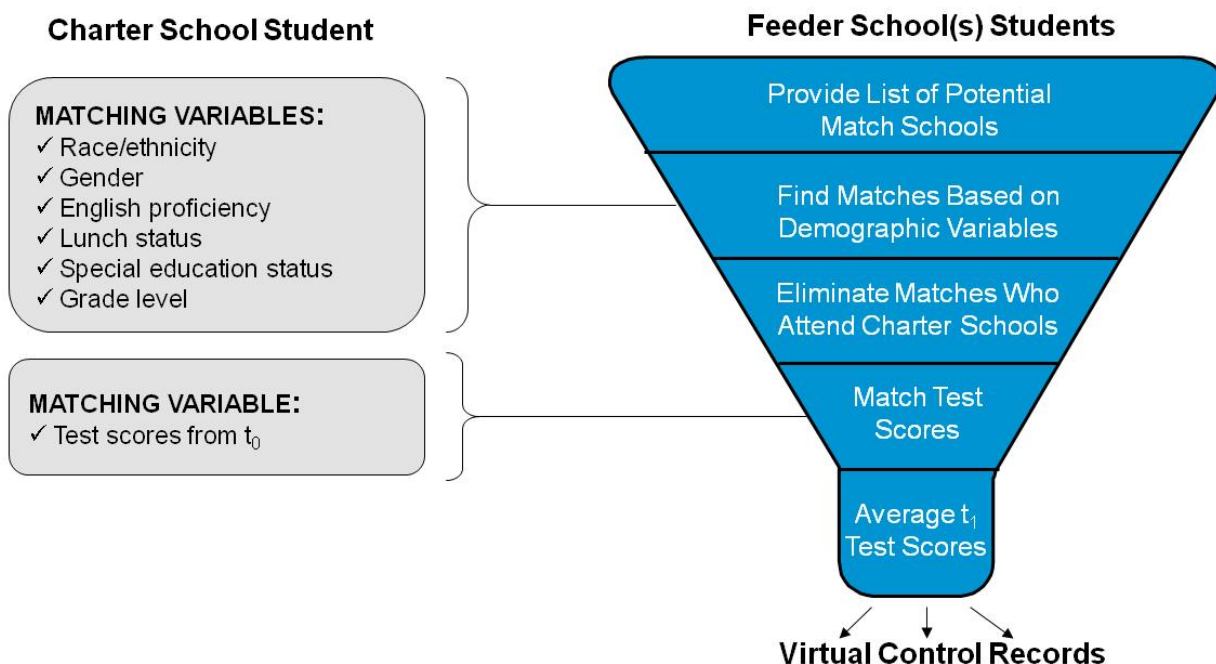
synthesis of their academic performance to use as the counterfactual to the charter school student's performance.

Our approach is displayed in Figure 1. We identify all the traditional public schools whose students transfer to a given charter school; each of these schools is a "feeder school." Once a TPS qualifies as a feeder school, all the students in the school become potential matches for a student in a particular charter school. All the student records from all the feeder schools are pooled – this becomes the source of records for creating the virtual match. Using the records of the students in those schools in the year prior to the test year of interest (t_0), CREDO selects all of the available TPS students that match each charter school student.

Match factors include:

- Grade-level
- Gender
- Race/Ethnicity
- Free or Reduced Price Lunch Status
- English Language Learner Status
- Special Education Status
- Prior test score on state achievement tests

Figure 1: CREDO Virtual Control Record Methodology



At the point of selection as a VCR-eligible TPS student, all candidates are identical to the individual charter school student on all observable characteristics, including prior academic achievement. The use of prior academic achievement as a match factor encompasses all the unobservable characteristics of the student, such as true socioeconomic status, family background, motivation, and prior schooling. The focus then moves to the subsequent year, t_1 . The scores from this test year of interest (t_1) for as many as seven VCR-eligible TPS students are then averaged and a Virtual Control Record is produced. The VCR produces a score for the test year of interest that corresponds to the expected gains a charter student would have realized if he or she had attended one of the traditional public schools that would have enrolled the charter school's students. The VCR provides the counterfactual "control" experience for this analysis.

For the purposes of this report, the impact of charter schools on student academic performance is estimated in terms of academic growth from one school year to the next. This increment of academic progress is referred to by policy makers and researchers as a "growth score" or "learning gains" or "gain scores." Using statistical analysis, it is possible to isolate the contributions of schools from other social or programmatic influences on a student's growth. Thus, all the findings that follow are measured as the average one-year growth of charter schools, relative to the VCR-based comparison.

With five years of student records in New Jersey, it is possible to create four periods of academic growth. One growth period needs a "starting score", (i.e., the achievement test result from the spring of one year) and a "subsequent score" (i.e., the test score from the following spring) to create a growth score. To simplify the presentation of results, each growth period is referred to by the year in which the second spring test score is obtained. For example, the growth period denoted "2008" covers academic growth that occurred between the end of the 2006-2007 and the end of the 2007-2008 school years. Similarly, the time period denoted "2011" corresponds to the year of growth between the 2009-2010 and 2010-2011 school years.

With five years of data and six tested grades (3rd - 8th), there are 30 different sets of data each for Reading and Math; each subject-grade-year group of scores has slightly different mid-point averages and distributions. The analysis is helped by transforming the test scores for all these separate tests into a common measurement. All test scores have been converted to "bell curve" standardized scores so that year-to-year computations of growth can be made.³

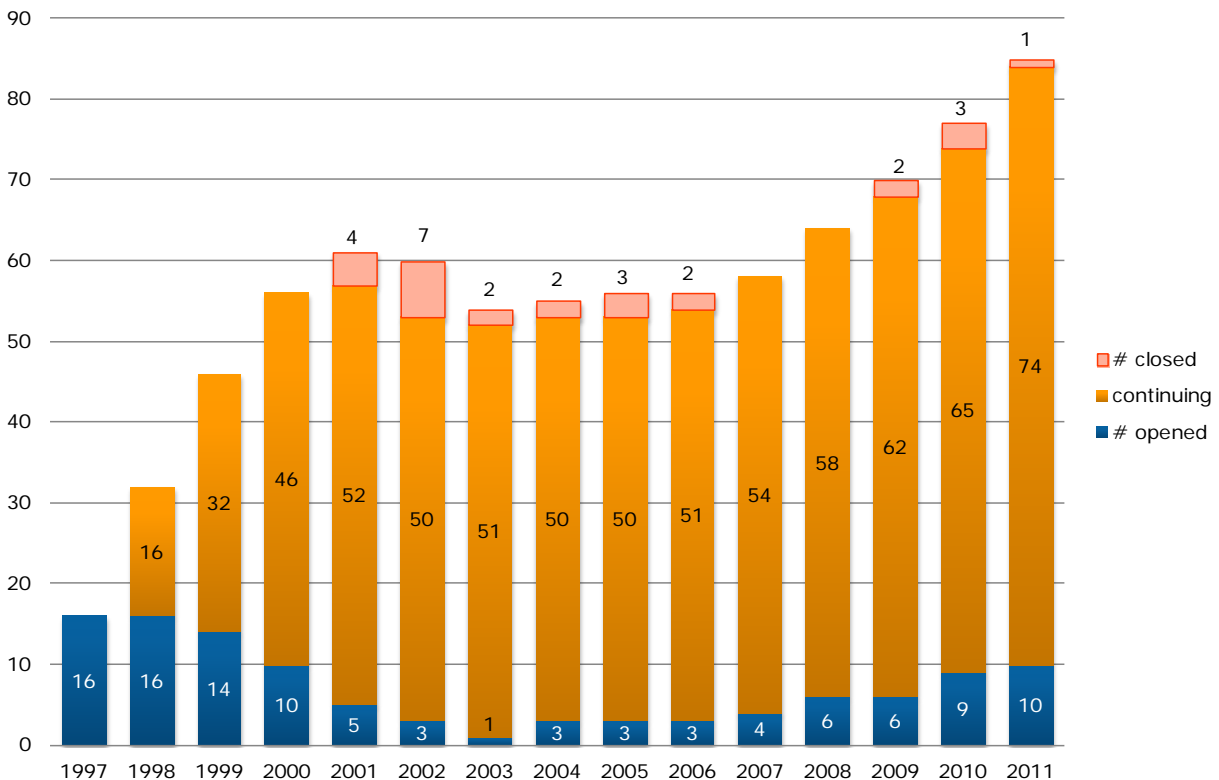
When scores are thus standardized into z-scores, every student is placed relative to his peers in his own state. A z-score of zero, for example, denotes a student at the 50th percentile in that state, while a z-score one standard deviation above that equates to the 84th percentile. Students who maintain their relative place from year to year would have a growth score of zero, while students who make larger gains relative to their peers will have positive growth scores. Conversely, students who make smaller academic gains than their peers will have negative growth scores in that year.

³ For each subject-grade-year set of scores, scores are centered around a standardized midpoint of zero, which corresponds to the actual average score of the test before transformation. Then each score of the original test is recast as a measure of deviation around that new score of zero, so that scores that fell below the original average score are expressed as negative numbers and those that were larger are given positive values. These new values are assigned so that in every subject-grade-year test, 68 percent of the former scores fall within a given distance, known as the standard deviation. The technical reports on the New Jersey achievement tests reveal that 5% of all test takers ace the test, causing the underlying distribution of the scores to be less than perfectly normally distributed. The range of scores in the charter sector evades any potential problem of non-normality.

New Jersey Charter School Demographics

The New Jersey charter school sector has grown markedly since its inception in 1997. Figure 2 below notes the new, continuing and closed charter school campuses from the fall of 1997 to the fall of 2011.

Figure 2: Opened and Closed Charter Campuses, 1997-2011



According to the National Center for Education Statistics (NCES), there were 70 charter schools open in New Jersey in the 2009-2010 school year.^{4,5} Because charter schools are able to choose their location, the demographics of the charter sector may not mirror that of the TPS sector as a whole. Further, charter schools create a degree of sorting through their offer of different academic programs and

⁴ This is the most recent year available from the NCES Common Core of Data Public School Universe.

⁵ There is a slight mismatch between the NCES number of charter schools in 2009 and the number of charter campuses from Figure 1. Some schools in New Jersey have multiple campuses that share one school ID number. Although we are able to track campus openings at the school level, we are not able to distinguish students by campus in this study.

alternate school models. In addition, parents and students who choose to attend charter schools select schools for a variety of reasons such as location, school safety, small school size, academic focus or special interest programs. The cumulative result of all these forces is that the student populations at charters and their TPS feeders may differ. Figure 3 below maps the charter school locations in New Jersey, and Table 1 below compares the student populations of all New Jersey's traditional public schools, the charters' feeder schools, and the charter schools themselves.

Figure 3: New Jersey Charter School Locations

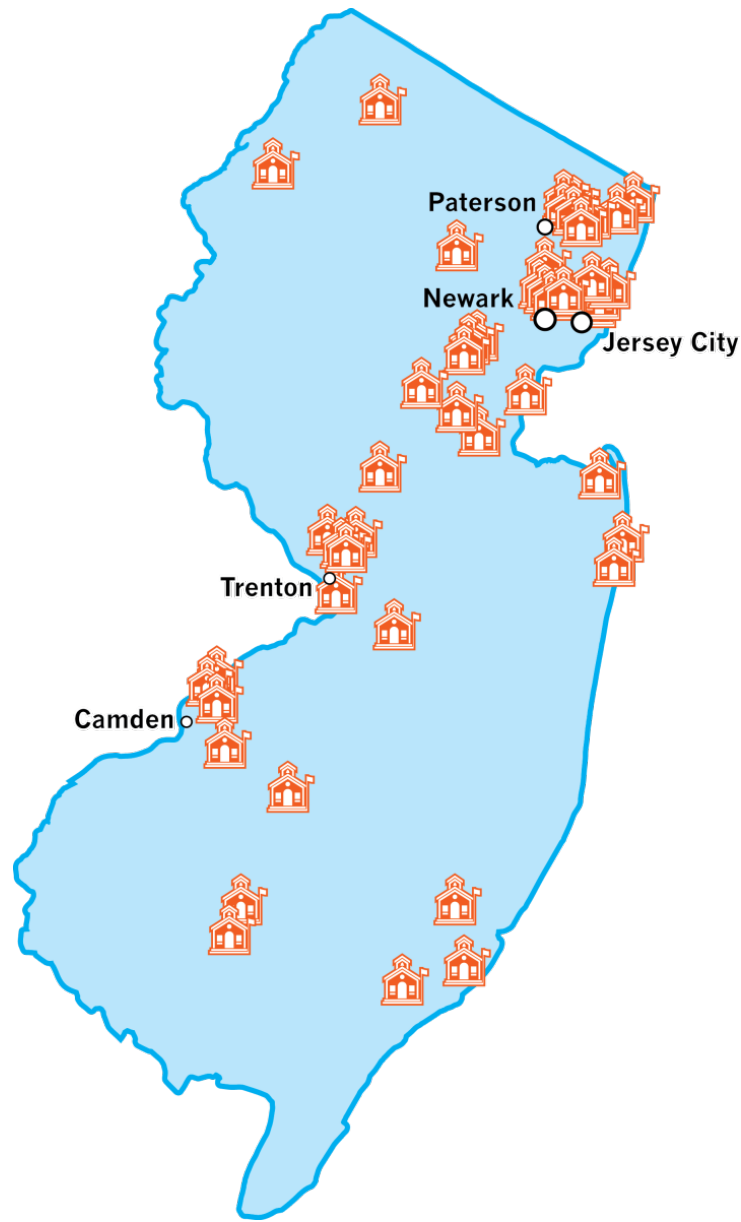


Table 1: Demographic Comparison of Students in TPS, Feeders and Charters

	TPS	Feeders	Charters
Number of schools	2520	379	70
Average enrollment per school	541	543	328
Total number of students enrolled	1,364,115	205,633	22,981
Students in Poverty	30%	62%	61%
English Language Learners	4%	9%	2%
Special Education Students	14%	14%	9%
White Students	54%	22%	9%
Black Students	16%	34%	60%
Hispanic Students	21%	37%	28%
Asian/Pacific Islander Students	9%	6%	3%
Native American Students	0.2%	0.2%	0.1%

As the map of charter school locations shows charter schools are concentrated in five urban areas: Newark, Jersey City, Paterson, Trenton and Camden. For this reason alone, one would not expect charter school populations to parallel the demographics of the New Jersey TPS population as a whole. Table 1 bears this out: charter schools have more students in poverty, more Black and Hispanic students and fewer Whites and Asians.

The feeder school populations would be expected to more closely align demographically, but even here there are significant differences. Charter schools enroll greater shares of Black students and a smaller share of students are Hispanic, White or Asian, compared to the feeder schools. Feeder schools and charter schools have the same proportions of students living in poverty.

There has been considerable attention paid to the share of students in charter schools who are receiving Special Education services or who are English Language Learners. As shown in Table 1, a lower proportion of New Jersey’s charter school population is designated as special education compared to all TPS, and this proportion is also lower than that of the feeder TPS population. The cause of this difference is unknown. Parents of children with special needs may believe the TPS sector is better equipped to educate their children and therefore will be less likely to opt out for a charter. An alternate possibility is that charter schools and traditional public schools have different criteria for categorizing special education.

The profile for English Language Learners also shows that, in the aggregate, charter schools enroll a smaller share than the feeder schools do. Charter schools enroll roughly the same percentage of English Language Learners as found statewide in

TPS. As with Special Education students, it is not possible to discern the underlying causes for the differences in these figures.

Table 2: Demographic Composition of Charter Students in the Study

Student Group	All Charter Students Tested		Matched Charter Students	
	Number	Percent	Number	Percent
New Jersey Charter Students	13,904		10,772	
% Matched	10,772	77%		
Black Students	7,859	57%	6,302	59%
Hispanic Students	4,209	30%	3,357	31%
White Students	1,365	10%	901	8%
Students in Poverty	9,964	72%	8,189	76%
Special Education Students	1,631	12%	953	9%
English Language Learners	243	2%	105	1%
Grade Repeating Students	483	3%	39	0.4%

NOTE: The appendix includes additional descriptive demographics.

For this analysis, a total of 10,772 charter school students (an average of 16,517 observations) from 60 charter schools are followed for as many years as data are available.⁶ The students are drawn from Grades 3 – 8, since these are the continuous grades that are covered by the state achievement testing program for reading and math. An identical number of virtual comparison records are included in the analysis. In New Jersey, it was possible to create virtual matches for 77 percent of the tested

A Roadmap to the Graphics

The graphics in this report have a common format.

Each graph presents the average performance of charter students relative to their **pertinent comparison student**. The reference group differs depending on the specific comparison. Where a graph compares student subgroup performance, the pertinent comparison student is the same for both subgroups. Each graph is labeled with the pertinent comparison group for clarity.

The **height** of the bars in each graph reflects the magnitude of difference between traditional public school and charter school performance over the period studied.

Stars are used to reflect the level of statistical significance of the difference between the group represented in the bar and its comparison group; the absence of stars means that the schooling effect is not statistically different from zero.

Comparisons of the **performance of similar student subgroups** contain an additional test of the absolute difference between the charter school subgroup and their comparison VCRs. Where a charter school student subgroup has learning gains that are statistically significantly different, the bars have a gradient shade.

⁶ Schools that have opened recently or that have only recently begun serving tested grades will not have four growth periods of experience to include.

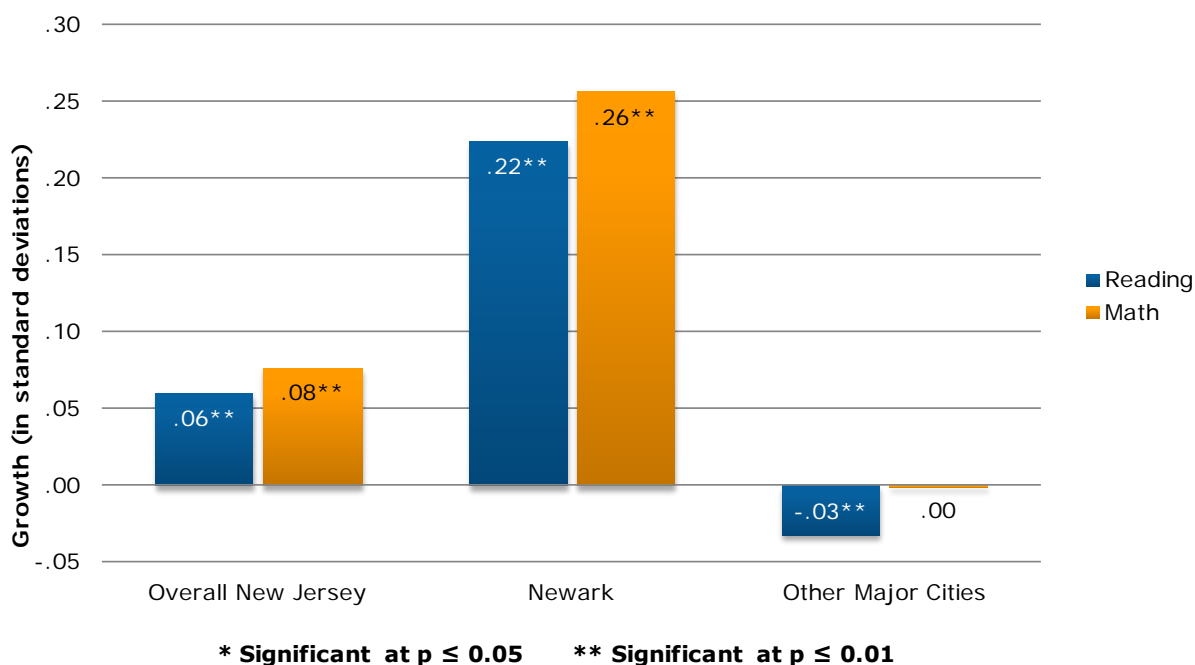
charter school students in both reading and math. This proportion assures that the results reported here can be considered indicative of the overall performance of charter schools in the state.⁷ The total number of observations is large enough to be confident that the tests of effect will be sensitive enough to detect real differences between charter school and TPS student performance at the statistically acceptable standard of $p < .05$. This is also true for each student subgroup examined, with the possible exception of grade-repeating students, as can be seen in Table 2 above.

Overall Charter School Impact

First, we examine whether charter schools differ overall from traditional public schools in how much their students learn, holding other factors constant. To answer this question, we average the pooled performance for all charter school students across all the growth periods and compare it with the same pooled performance of the VCRs. The result is a measure of the average one-year learning of charter school students compared to the average growth for VCRs in the state. The results appear in Figure 4. On average, students in New Jersey charter schools learned significantly more than their virtual counterparts in reading and mathematics.

⁷ We were unable to find matches for 23 percent of the students; a significant share of these were grade repeaters (since many charter schools differ from TPS in their stance on social promotion), some had unusual combinations of characteristics such as ELL and SPED, and others had baseline test scores that were in the extreme tails of the distribution.

Figure 4: Average Learning Gains for Students in New Jersey Charter Schools Compared to Gains for VCR Students in Each Charter Schools' Feeder TPS in 2008-2011



When we investigate the learning impacts of Newark charter schools separately, we find that their results are larger in reading and math than the overall state results. Grouping the other four major cities in New Jersey (Camden, Trenton, Jersey City, and Paterson) shows that charter students in these areas learn significantly less than their TPS peers in reading. There are no differences in learning gains between charter students in the four other major cities and their virtual counterparts in math.

The data is analyzed in units of standard deviations of growth so that the results will be statistically correct. These units, unfortunately, do not have much meaning for the average reader. Transforming the results into more accessible units is challenging and can be done only imprecisely. Therefore, Table 3 below, which presents a translation of various outcomes, should be interpreted cautiously.⁸

⁸ Hanushek, Eric A. and Steven G. Rivkin. Teacher quality. In *Handbook of the Economics of Education*, Vol. 2, ed. EA Hanushek, F Welch, (2006): 1051–1078. Amsterdam: North Holland.

Table 3: Transformation of Average Learning Gains

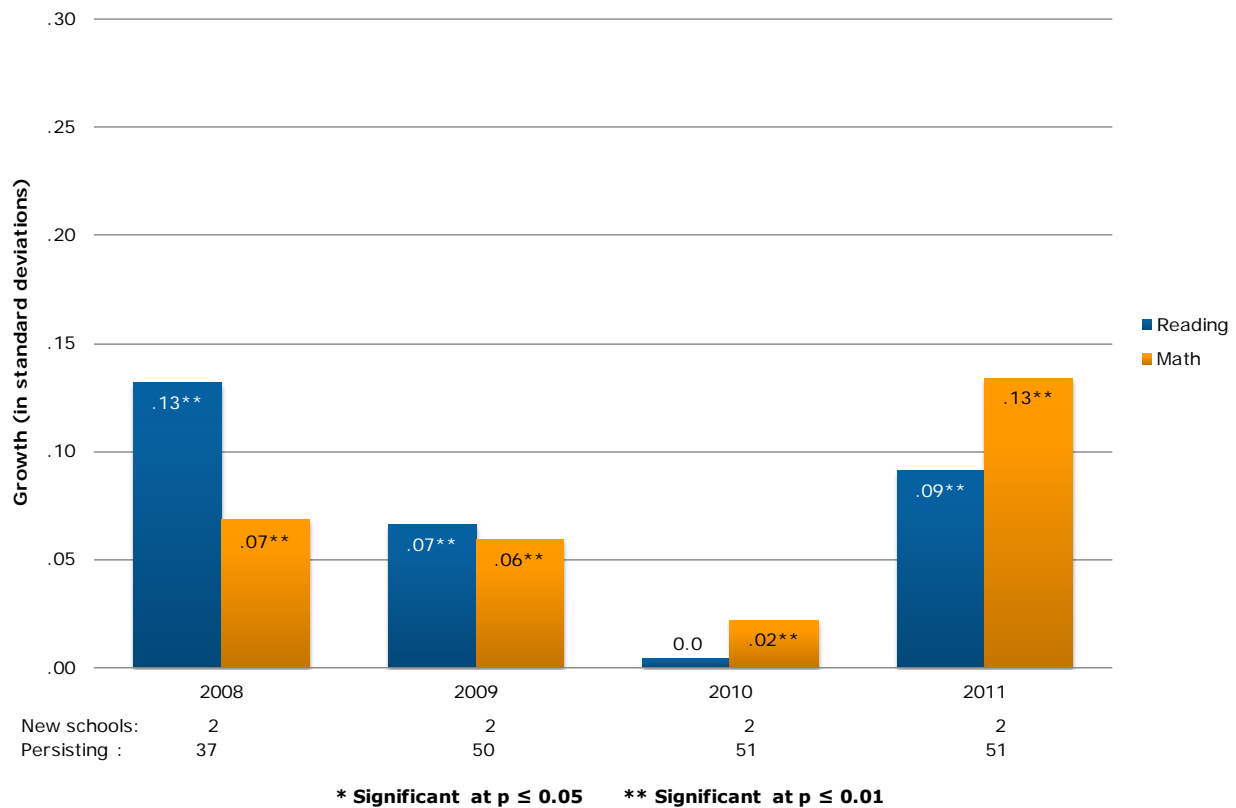
Growth (in standard deviations)	Gain (in months of learning)
0.00	0.0
0.05	1.8
0.10	3.6
0.15	5.4
0.20	7.2
0.25	9.0

Using the results from Figure 4 and the transformations from Table 3, per year of schooling, on average charter students in New Jersey gain an additional two months of learning in reading over their TPS counterparts. In math, the advantage for charter students is about three months of additional learning in one school year. Charter students in Newark gain an additional seven and a half months in reading and nine months in math.

Charter School Impact by Year

To determine whether performance remained consistent over all the years of study, the average charter school effects were disaggregated into the four growth periods. Results are shown in Figure 5 along with the number of newly opened and persisting schools for each year.⁹

Figure 5: Impact by Growth Period, 2008-2011



In reading, charter students in New Jersey learned significantly more than their virtual counterparts in three of the four periods analyzed. In 2010, the charter impact on reading was positive but not significant. The results were positive and significant for all four periods in math. In both reading and math, however, the lowest charter school impacts are in 2010. Disaggregating the impacts by new and persisting schools did not shed much light on the issue. The new and persisting

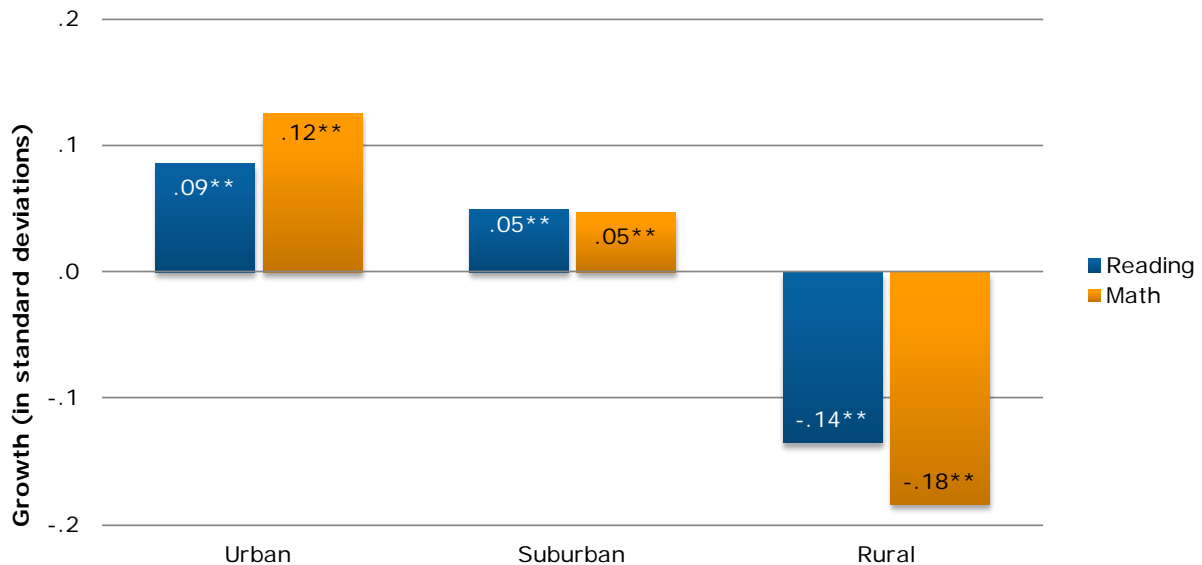
⁹ Note the jump in the number of persisting schools between the 2008 and 2009 periods. Eleven schools appeared in the data with tested students for the first time, although they were opened in prior years.

schools had similar effects in reading in 2010.¹⁰ In math, the impact of the persisting schools was much smaller in 2010 than in any other period; this is the only period in which the new schools had a larger impact.

Charter School Impact by Location

Although charter schools in urban areas receive the bulk of media attention, charter schools can and do choose to locate in other locales. Differences in location may correlate to different average charter school effects. The results in Figure 6 represent the disaggregated impacts for urban, suburban, and rural charter schools based on designations provided by the National Center for Education Statistics.

Figure 6: Impact by School Location



* Significant at $p \leq 0.05$ ** Significant at $p \leq 0.01$

Students enrolled in urban charter schools in New Jersey learn significantly more in both math and reading compared to their peers in TPS. This is also true for students in suburban charter schools, although the impact is not as large. Students in rural charter schools, however, learn significantly less than their TPS peers in both reading and math.

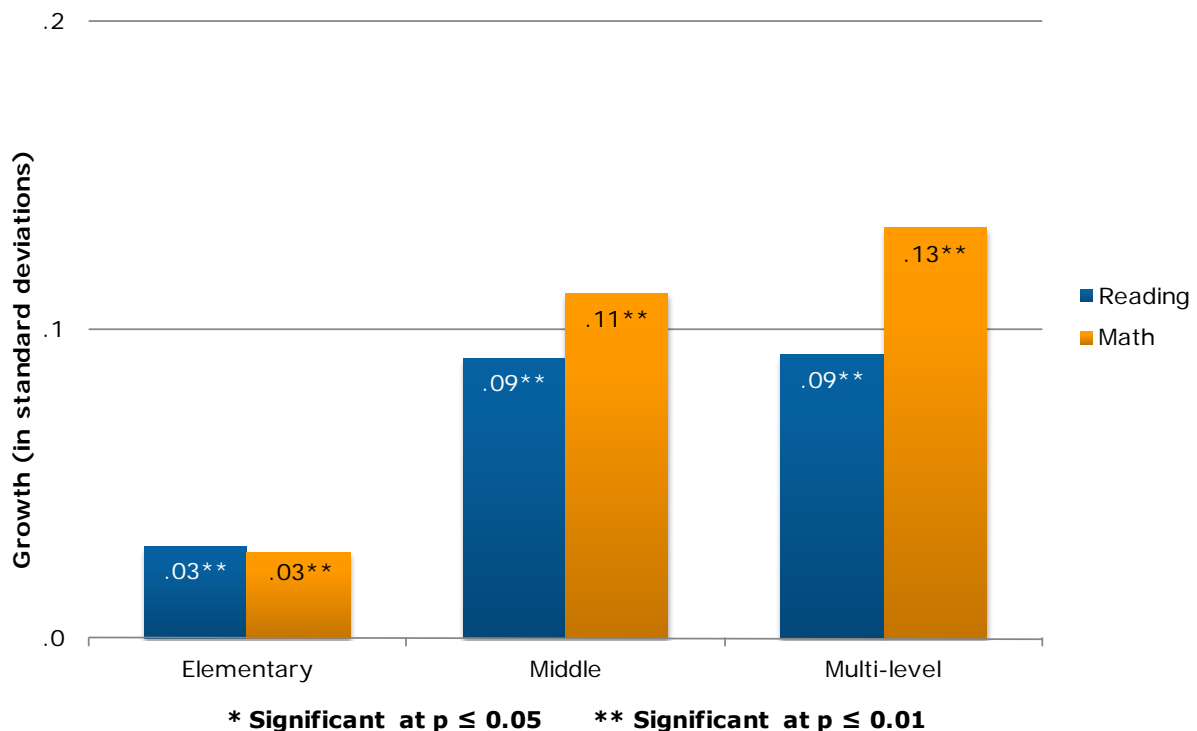
¹⁰ The atypical result for the 2010 growth period may reflect changes in the state achievement testing regime in the prior two years, which resulted in new standards and higher performance requirements.

Charter School Impact by School Level

The flexibility and autonomy enjoyed by charter schools allows them to choose which grade levels to serve, with many charter operators deciding to focus on particular ages while others seek to serve a broader range of students. For example, multi-level charter schools serve grade ranges larger than traditional elementary, middle or high schools, such as a combination of middle and high school grades. These school levels are tracked by the National Center for Education Statistics, which allows us to disaggregate charter school impacts for different grade spans.

This study examined the outcomes of students enrolled in elementary, middle and multi-level schools. The results appear in Figure 7. Growth scores could not be calculated for high schools, since testing data exists for only one grade level in that grade span (grade 11). Without additional performance data such as end of course exams, we are not able to estimate the effectiveness of high schools.

Figure 7: Impact by School Level



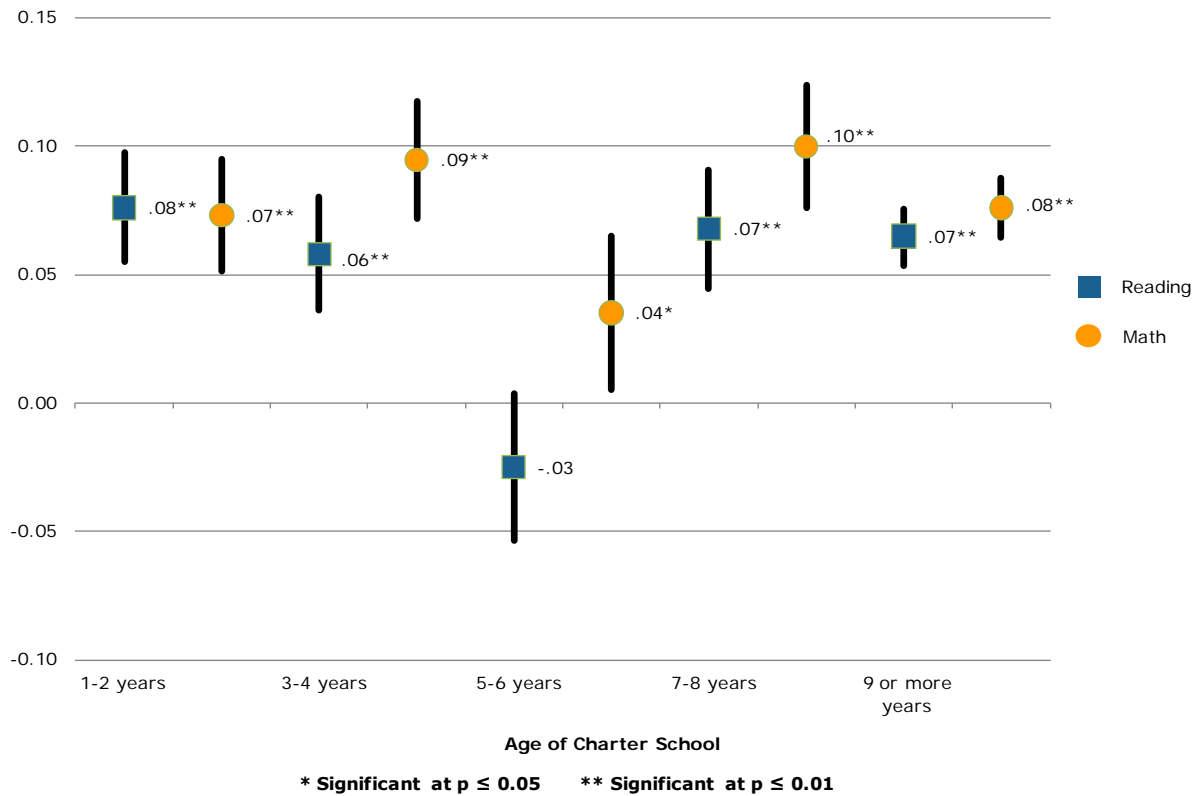
The results show that, on average, charter students learn significantly more than their virtual counterparts in both reading and math regardless of the grade span

served by the charter they attend. This positive effect is more pronounced in middle schools and multi-level schools than in elementary charter schools.

Charter School Impact by Age of Charter and Students' Years of Enrollment

To further explore the charter school effects in New Jersey, we tested the impact of charter schools at various points as they matured (this analysis differs from the longitudinal results presented in Figure 5). We calculated the period-by-period effects of all the charter schools in the sample, then computed the average growth for all the schools at each age. Figure 8 presents these results; for each grouping, the average effect is noted along with a vertical line displaying the distribution around the average. We are interested in the distribution as well as the average, since it might be reasonable to expect that schools become more consistent as they mature.

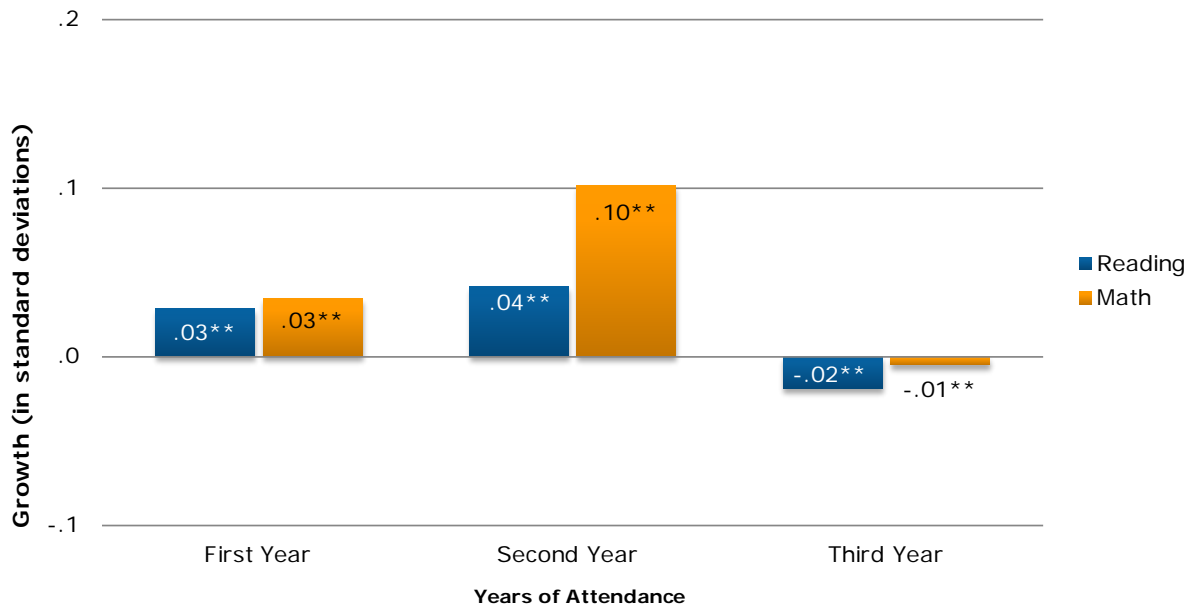
Figure 8: One-Year Average Learning Gains by Age of Charter School



The analysis shows that charter schools of almost all ages have positive and significant effects on learning gains in both reading and math compared to their TPS counterparts. The sole exception is reading growth measured for students at charter schools open for 5-6 years, which was not significantly different than their traditional public school counterparts. The figure also shows that the most mature group of charter schools is more consistent than younger charters.

Regardless of the age of the charter school, student growth in charter schools may change as students continue their enrollment over time. To test this, students were grouped by the number of consecutive years they were enrolled in charter schools. In this scenario, the analysis is limited to a subset of our charter student sample to only include those who enrolled for the first time in a charter school between 2007-2008 and 2010-2011. Although the number of students included will be smaller, it is the only way to ensure that we can isolate the impact of years of enrollment on student academic progress. This question examines whether the academic success of students who enroll in a charter school changes as they continue their enrollment in a charter school. The results are shown below in Figure 9.

Figure 9: Impact by Students' Years of Enrollment



* Significant at $p \leq 0.05$ ** Significant at $p \leq 0.01$

The results suggest that in their first year of attendance, new charter school students have an initial gain in reading and math compared to their counterparts in traditional public schools. This positive finding contrasts with the parallel result in the 2009 national study which showed a negative first year impact on student learning. In the second year of attendance, an even larger gain in learning compared to students in TPS is observed in both reading and math. In the third year there is no significant difference in learning compared to their counterparts in TPS in reading or math.

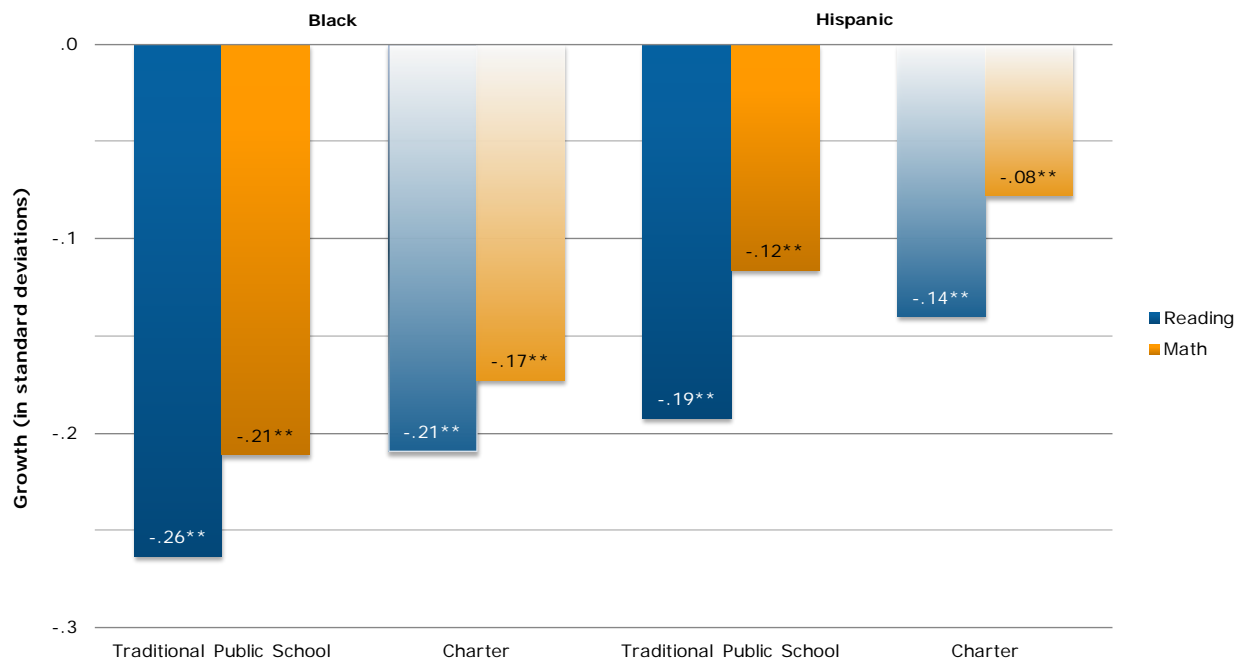
Charter School Impact with Race/Ethnicity

Attention in US public education to achievement differences by racial and ethnic backgrounds has increased since the passage of the *No Child Left Behind Act* in 2001. The effectiveness of charter schools across ethnic and racial groups is especially important given the proportion of charter schools that are focused on serving historically underserved students. The impact of charter schools on the academic gains of Black and Hispanic students is presented in Figure 10 below.

The graph displays two distinct comparisons, described below:

- The first comparison displays the performance of TPS students in the subgroups of interest relative to the "average white student in TPS" in this comparison, the white student does not qualify for subsidized school meals, Special Education services or English Language Learner support and is not repeating a grade. The values that appear in each vertical bar indicate the magnitude of difference from this comparison student, and the stars indicate the level of statistical significance. Thus, if there is no difference in the learning gains, the bar would be missing entirely; if the learning of the student group in question is not as great as the comparison baseline, the bar is negative and if the learning gains exceed the comparison, the bar is positive.
- A second comparison tests whether the learning gains in the charter school student subgroup differs significantly from their peers in the same student subgroup in their feeder TPS. Where the difference is significant, the charter school bar has gradient shading.

Figure 10: Impact with Black and Hispanic Students



* Significant at $p \leq 0.05$ ** Significant at $p \leq 0.01$

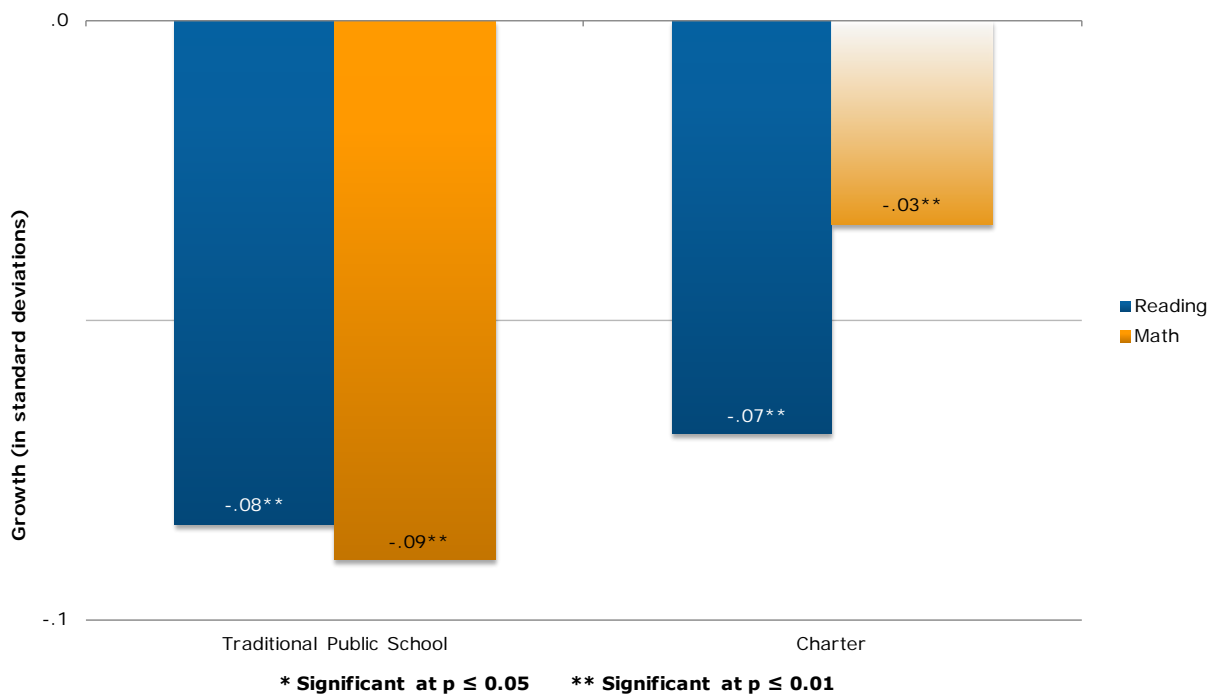
On average, Black students in both TPS and charter schools have significantly smaller gains in reading and math than those of average white students in TPS, the baseline of comparison. However, Black students enrolled in charter schools show significantly better performance in reading and math compared to Black students in TPS.

Hispanic students in both TPS and charter schools also have gains in math and reading that are smaller than those of white students in TPS, the baseline of comparison. In both math and reading, Hispanic students in charter schools perform significantly better than Hispanic students in TPS.

Charter School Impact with Students in Poverty

Much of the motivation for developing charter schools aims at improving education outcomes for students in poverty. The enrollment profiles of charter schools across the country underscore this fact; in New Jersey, 61 percent of charter students are eligible for subsidized school meals, a proxy for low income households. Thus, the impact of charter schools on the learning of students in poverty is important in terms of student outcomes and as a test of the commitment of charter school leaders and teachers to address the needs of this population. Figure 11 presents the results for students in poverty. In this graph, the comparison student is a student who pays full price for school meals in TPS, a proxy for not being in poverty.

Figure 11: Impact with Students in Poverty

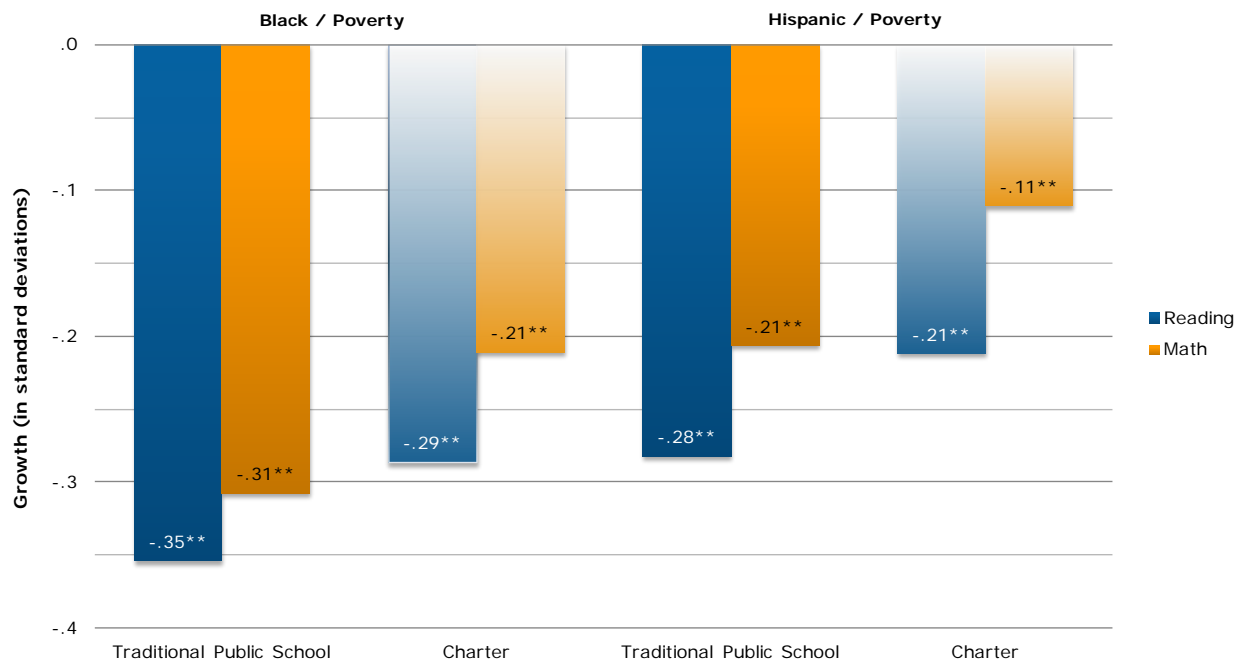


As shown in the figure above, in New Jersey, students in poverty perform significantly worse than their non-poverty peers regardless of whether they attend a TPS or a charter. However, students in poverty who are enrolled in charter schools perform significantly better in math compared to students in poverty in TPS. Charter students in poverty receive no significant benefit or loss in reading gains compared to their TPS peers in poverty.

Charter School Impact with Race/Ethnicity and Students in Poverty

Many charter schools have a dual mission to educate historically underserved minority students who are also living in poverty. The impact of charter schools on the academic gains of Black students living in poverty and Hispanic students living in poverty is presented in Figure 12 below.

Figure 12: Impact with Black and Hispanic Students in Poverty



* Significant at $p \leq 0.05$ ** Significant at $p \leq 0.01$

Black students in poverty in both TPS and charter schools have smaller gains in reading and math than those of the average non-poverty white TPS student, the baseline of comparison. However, Black students in poverty who are enrolled in charter schools show significantly better performance in reading and math compared to Black students in poverty in TPS.

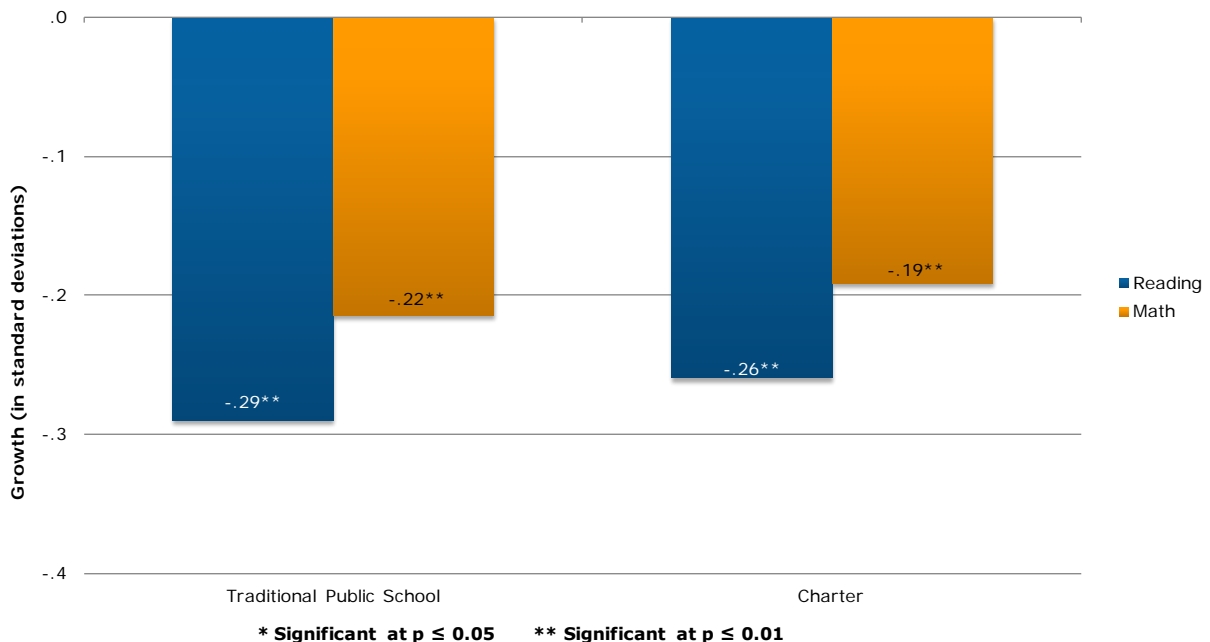
Hispanic students in poverty in both TPS and charter schools have gains in math and reading that are smaller than those of white students in traditional public schools, the baseline of comparison. In both math and reading, Hispanic students in poverty in charter schools perform significantly better than Hispanic students in poverty at TPS.

Charter School Impact with Special Education Students

The demographic comparisons in the CREDO national charter school report released in 2009 indicated that across the charter sector, schools serve fewer Special Education students than the traditional public schools both in number of students and as a proportion of their enrollment. In some cases, this is a deliberate and coordinated response with local districts, based on a balance of meeting the needs of the students and a consideration of cost-effective strategies for doing so. In New Jersey, the overall proportion of charter school students who are Special Education is 9 percent, compared to 14 percent in TPS statewide and in the charter schools' feeder schools. Anecdotal evidence suggests that TPS and charters may differ in their criteria for designating students as needing to be assessed for special education services; this topic has been flagged for future study on student enrollments.

It is especially difficult to compare the outcomes of Special Education students, regardless of where they enroll. The most serious challenge rests on the small numbers of Special Education students. Consequently, there is tremendous variation when all categories are aggregated, a necessary and messy requirement for comparison purposes. Of all the facets of the current study, this one deserves the greatest degree of skepticism. With this cautionary note, the results are presented in Figure 13 below.

Figure 13: Impact with Special Education Students



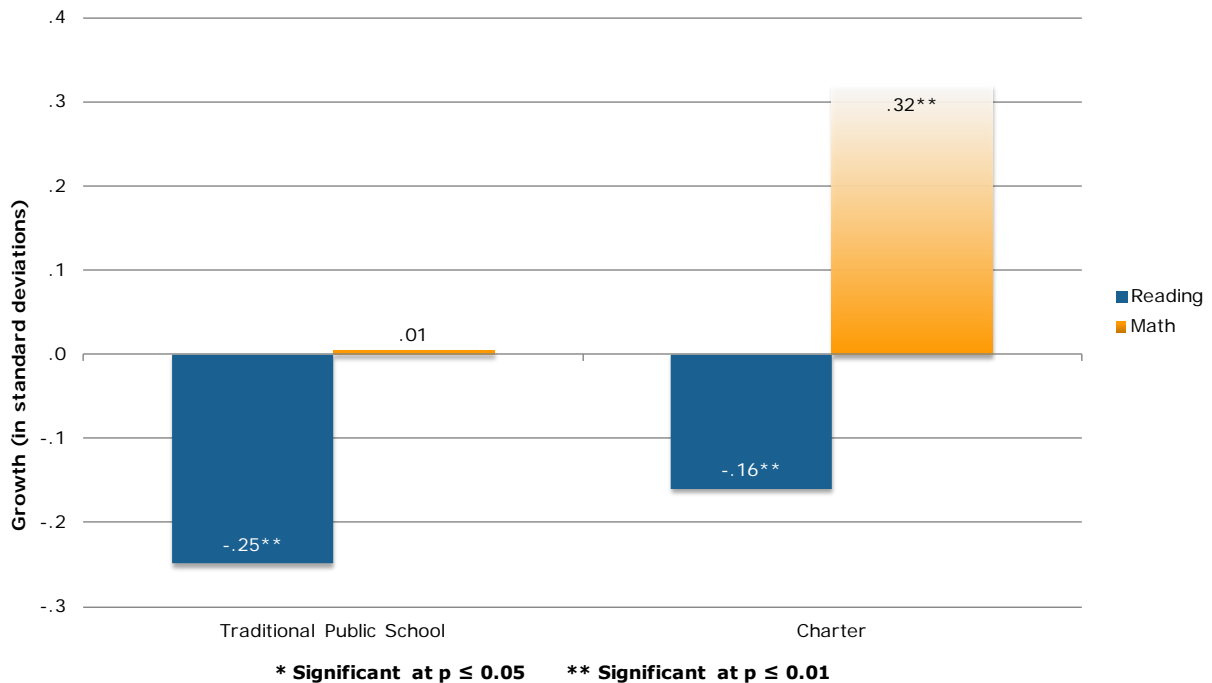
Special Education students enrolled in both TPS and charter schools perform significantly worse than students not receiving special education services. In charter schools in New Jersey, Special Education students receive no significant benefit or loss from charter school attendance compared to their counterparts in TPS in either reading or math.

Charter School Impact with English Language Learners

Students who enroll in school without sufficient English proficiency represent a growing share of public school students. Their success in school today will greatly influence their success in the world a decade from now. Since their performance, as reflected by National Assessment of Education Progress, lags well behind that of their English proficient peers, their learning gains are a matter of increasing focus and concern nationally and in New Jersey.

The comparison of learning gains of charter school English Language Learners and their TPS counterparts appears in Figure 14.

Figure 14: Impact with English Language Learners



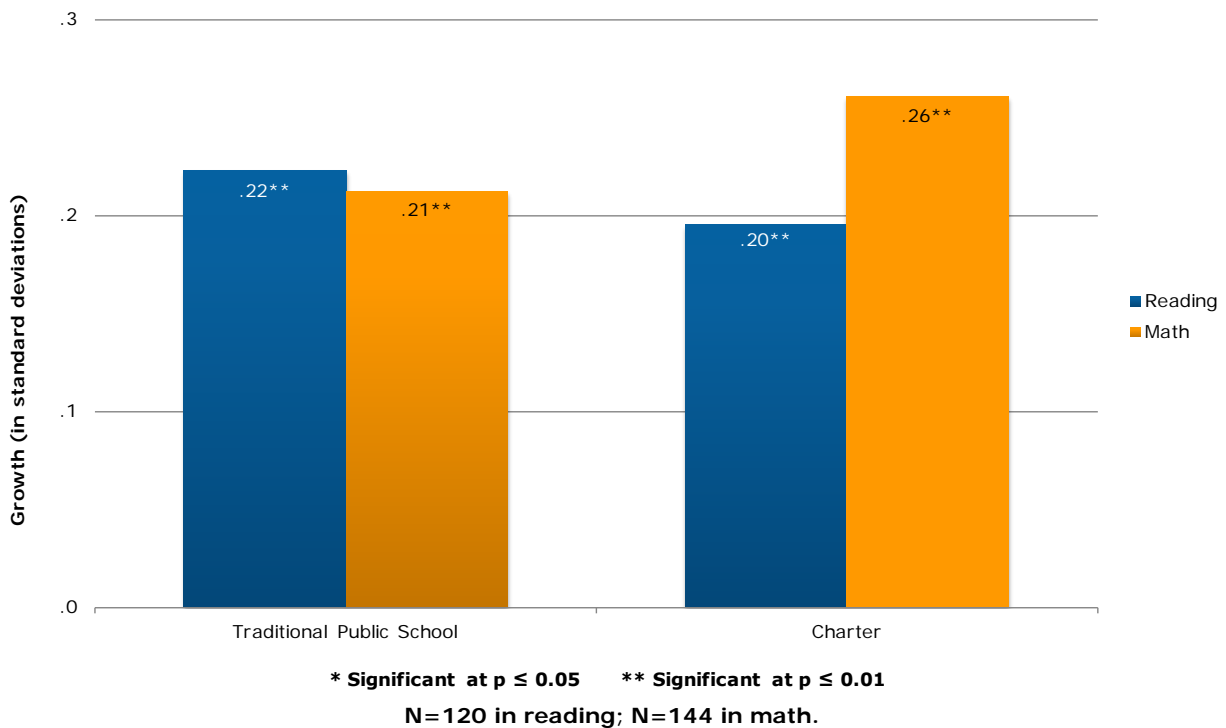
English Language Learner students in both TPS and charter schools learn significantly less than native/fluent English speakers in reading. English Language Learners in TPS have similar learning gains to native/fluent English speakers in math but those enrolled in charter schools have significantly better learning gains than fluent speakers in TPS. English Language Learners in charter schools have similar gains in reading as their counterparts in TPS and significantly better results in math.

Charter School Impact with Grade-Repeating Students

This study examined the outcomes of students who were retained. Often a highly charged topic, the underlying premise is that additional time in a grade can help students by remediating deficits and shoring up grade-level competencies. Existing research on the outcomes of students who have been retained is limited.

Retention practices differ widely across the country and between the charter and TPS sectors. The fact that retained charter students have the lowest match rate (7 percent) of any subgroup in our study suggests that charter schools are more likely to retain academically low-performing students. Although the results of learning gains following retention appear in Figure 15, interpreting these results must be done with caution since only 60 grade-repeating charter observations were able to be matched in reading and 72 in math. With the matching VCR observations, the analysis was based on 120 student records in reading and 144 in math.

Figure 15: Impact with Grade-Repeating Students



The retained students included in the analysis perform better than non-retained students in both TPS and charter schools in math and reading. There is no significant difference in learning gains between retained students at charter schools and retained students in TPS.

Charter School Impact by Student’s Starting Decile

A general tenet of charter schools is a commitment to the education and development of every child. Further, many charter schools, including several in New Jersey, have as part of their mission a specific emphasis on students who have not thrived academically in TPS and whose early performance is well below average. We examined the performance of charter schools to see if they produced equivalent results across the spectrum of student starting points and in relation to the results observed for equivalent students in TPS.

To do this, for charter school students and their VCRs, their baseline achievement test scores in reading and math were disaggregated into deciles. In this analysis, the base of comparison is the average academic growth of the TPS students in Decile 5, which corresponds to students in the 50th to 60th percentiles in the state.

Student achievement growth in each decile for charter school students and their VCRs was then compared. The results appear in Figures 16 and 17 below.

Figure 16: Impact by Students' Starting Decile – Reading

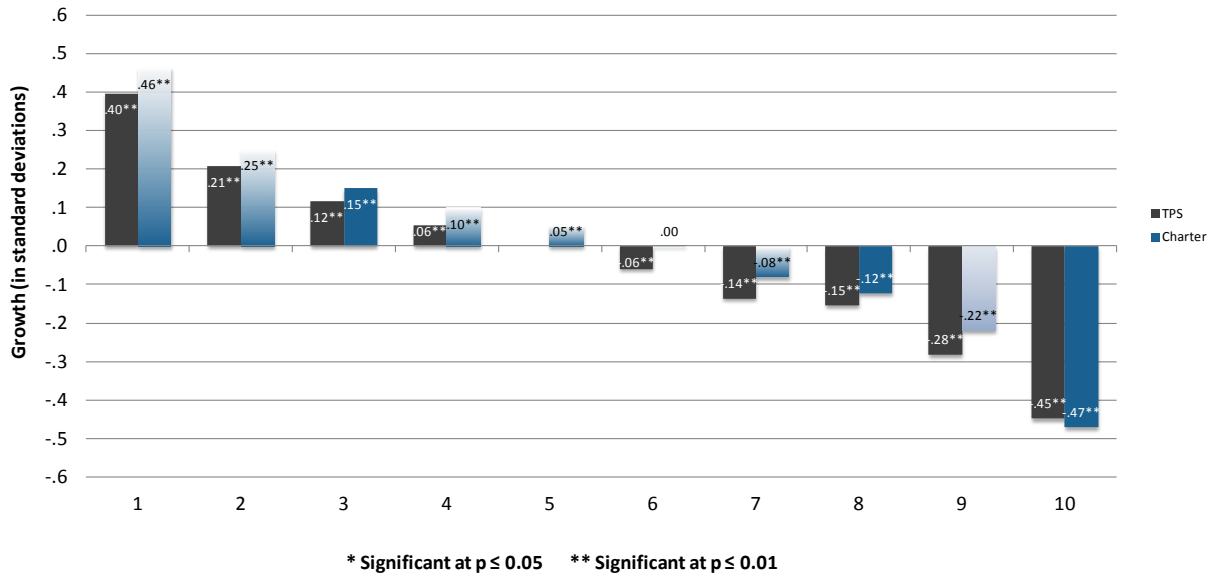
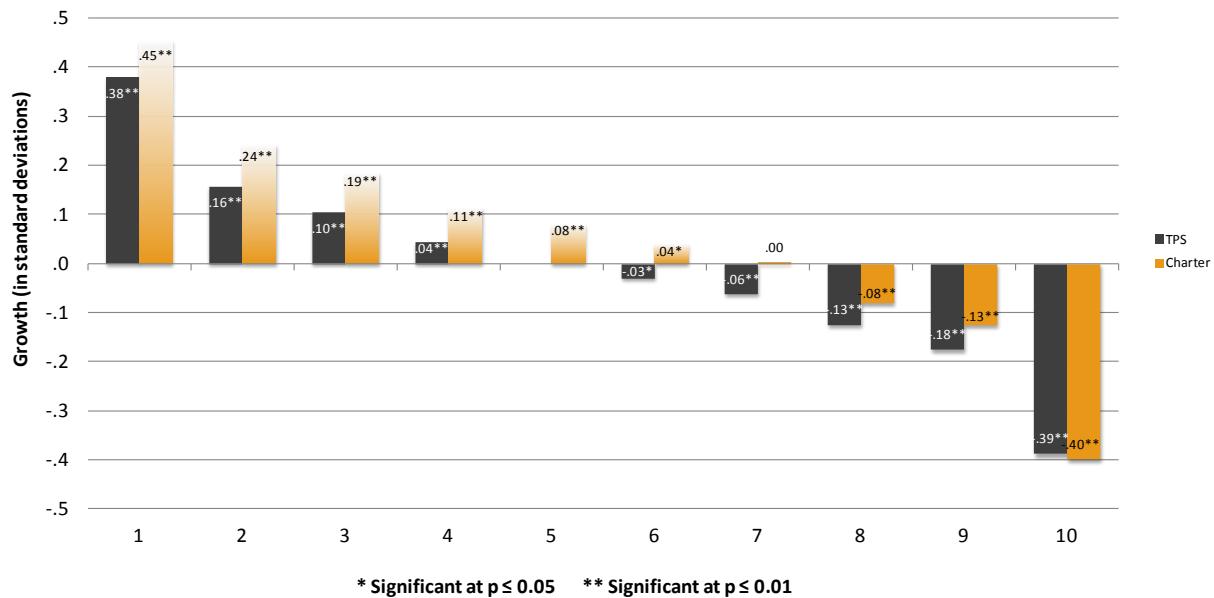


Figure 17: Impact by Students' Starting Decile – Math



Both figures demonstrate the expected “S”-shaped curve to the results. The overall curve reflects the typical pattern of larger learning gains for students with lower prior scores and larger learning losses for students with higher starting scores, a

phenomenon known as “regression to the mean.” Here, the relative magnitudes are what is important: Do charter schools produce relatively better growth results than TPS? If so, the charter curve would have larger gains on the low end and smaller losses on the high end of the distribution.

For students in New Jersey, Figures 16 and 17 show that charter schools do better than TPS in the lower and middle deciles in both reading and math. In the upper three deciles, the performance of charter schools is equivalent to the gains produced in TPS for these high achieving students, with the exception of the 9th decile in reading; in that decile, charter students outperform their TPS counterparts.

School-level Analysis

Comparative School-level Quality While the numbers reported above represent the average learning gains for charter school students across the state, the pooled average effects tell only part of the story. Parents and policymakers are also interested in school-level performance. In order to determine the current distribution of charter school performance, the average effect of charter schools on student learning over the two most recent growth periods (2010 and 2011) is compared to the experience the students would have realized in their local traditional public schools.¹¹ The performance of the VCR students associated with each charter school comprises this measure of the local educational market. This analysis provides an average contribution to student learning gains for each charter school. This measure is called the school's effect size; as for the overall and by-year impacts, it is expressed in standard deviations of growth.

As noted in Table 1, charter schools are generally smaller than their corresponding feeder schools. In addition, some charter schools elect to open with a single grade and mature one grade at a time. Consequently, care is needed when making school-level comparisons to ensure that the number of tested students in a school is sufficient to provide a fair test of the school impact. Our criteria for inclusion was at least 60 matched

A Note about Tables 6 and 7

There are four quadrants in each table. We have expanded on the usual quadrant analysis by dividing each quadrant into four sections. The value in each box is the percentage of charter schools with the corresponding combination of growth and achievement. These percentages are generated from the 2010 and 2011 periods.

The uppermost box on the left denotes the percentage of charters with very low average growth but very high average achievement. The box in the bottom left corner is for low-growth, low-achieving schools.

Similarly, the topmost box on the right contains the percentage of charters with very high average growth and very high average achievement, while the bottom right corner contains high-growth, low-achieving schools.

The major quadrants were delineated using national charter school data. We would expect about 46% of schools to have an effect size between -0.15 and 0.15 standard deviations of growth (the two middle columns). Similarly, we would expect about 50% of schools to achieve between the 30th and 70th percentiles. Therefore, if schools were randomly distributed, we would expect about 6% in any small square and about 25% of the schools to appear in the middle four squares.

¹¹ We chose to include only the two most recent growth periods in this analysis for two reasons. First, we wanted a highly relevant contemporary distribution of charter school performance. Second, using only two periods of data ensured that all schools' effect sizes were measured fairly; they are all based on one or two years of data instead of one year for some schools and four years for others.

charter student records over the two years, or, for new schools with only one year of data, at least 30 matched charter records.¹² Of our total sample of 59 schools with test scores in 2010 and 2001, 13 schools in reading and 14 schools in math had an insufficient number of individual student records to calculate a representative school-wide average growth score. Table 4 below shows the breakout of performance for the New Jersey charter schools which meet our criteria for inclusion by having a sufficient number of charter student records.

Table 4: Performance of Charter Schools Compared to Their Local Markets

Subject	Significantly Worse		Not Significant		Significantly Better	
	Number	Percent	Number	Percent	Number	Percent
Reading	5	10.9%	27	58.7%	14	30.4%
Math	6	13.3%	21	46.7%	18	40.0%

In reading, 30 percent of charter schools perform significantly better than their traditional public school market, while 40 percent perform significantly better in math. Both of these results are better than the national average proportion of better-performing charters (17 percent).¹³ The lowest school effect size in reading was -0.23 standard deviations of growth, while the highest effect size was 0.34. The gap between the lowest and highest effect sizes was larger in math; they were -0.26 and 0.39, respectively. A larger proportion of charter schools were not significantly different from their market in reading than in math.

Impact of Growth on Achievement While the impacts of charter schools on academic growth relative to their local competitors is instructive, it is necessary to take a wide-angle view to determine how well these students are being prepared. Because many of the students served by charter schools start at low levels of achievement, it is vital to understand how well their academic growth advances them in absolute achievement. To do this, each school's average growth is placed in the context of their average achievement level compared to the rest of the state, as in Tables 6 and 7 below. For growth, we use the effect sizes discussed above. The school's average achievement level is the mean achievement of the students

¹² Three schools in reading and two schools in math are represented by only one growth period.

¹³ CREDO. *Multiple Choice: Charter School Performance in 16 States* (2009). <http://credo.stanford.edu>.

over the same two periods covered by the effect size (2010 and 2011).¹⁴ The 50th percentile indicates statewide average performance for all public school students (traditional and charter). A school achievement level above the 50th percentile indicates that the school performs above the statewide average.

Table 5: Reading Growth and Achievement

Growth (in Standard Deviations)	Low Growth, High Achievement		High Growth, High Achievement		
	-0.15	0	0.15		
			2.2%	2.2%	70th Percentile
		4.3%	8.7%	4.3%	50th Percentile
	2.2%	6.5%	28.3%	4.3%	30th Percentile
	4.3%	21.7%	10.9%		
	Low Growth, Low Achievement		High Growth, Low Achievement		

In New Jersey, 28 of the 46 charter schools (about 61 percent) had positive average growth in reading, regardless of their average achievement. (This percentage is the sum of the squares in the blue and pink quadrants, the right half of the table.) About 17 percent of charters had positive growth and average achievement above the 50th percentile of the state (i.e., the total for the blue quadrant on the top right). About 78 percent of charters perform below the 50th percentile of achievement (the sum of the dark gray and pink quadrants in the lower portion of the table). Of concern is the nearly 35 percent of charters in the dark gray quadrant, which represents low growth and low achievement.

¹⁴ Average achievement was computed using students' z-scores from the end of the growth period (e.g. spring 2010 and spring 2011), and the resulting school-level mean was then converted into a percentile.

Table 6: Math Growth and Achievement

		Low Growth, High Achievement		High Growth, High Achievement		
		-0.15	0	0.15		
Growth (in Standard Deviations)				2.2%	2.2%	70th Percentile
			2.2%	15.6%	4.4%	50th Percentile
		2.2%	4.4%	13.3%	9.0%	30th Percentile
		9.0%	11.1%	22.2%	2.2%	
		Low Growth, Low Achievement		High Growth, Low Achievement		

For math, 32 of the 45 charter schools (71 percent) had positive average growth, as seen in the orange and peach quadrants. Over 24 percent of charters had positive growth and average achievement above the 50th percentile (the top right orange quadrant). About 73 percent of charters had achievement results below the 50th percentile of the state (the sum of the lower half of the table). Over 46 percent – nearly half – of New Jersey charters had positive growth and achievement below the 50th percentile in the state, as seen in the peach quadrant. If those schools continue their trends of positive academic growth, their achievement would be expected to rise over time.

Synthesis and Conclusions

The findings presented here show the typical student in New Jersey charter schools gains more learning in a year than his or her TPS counterparts, about two months of additional gains in reading and three months in math. These positive patterns are pronounced in Newark where historically student academic performance has been poor. The difference in learning in Newark charter school equates to seven and a half months of additional learning in reading and a full year more progress in

math. These outcomes are consistent with the statewide result that charter schools have significantly better results than TPS for minority students who are in poverty.

A substantial share of New Jersey charter schools appear to outpace TPS in how well they support academic learning gains in their students in both reading and math. Thirty percent of New Jersey charters outpace the learning impacts of TPS in reading, and 40 percent do so in math. Only a few of the schools included in the study have academic results that are significantly worse than their TPS counterparts; 11 percent of charter schools have results that are significantly worse than TPS for reading and 13 percent of schools for math.

The student-to-student and school-to-school results show charter schools to be performing well relative to the local alternatives. The larger question of whether charter schools are helping students achieve at high levels is also important. A quarter of New Jersey charter schools have below-average growth and below-average achievement in math, and the same is true for 35 percent of the charter schools in reading. Students in these schools will not only have inadequate progress in their overall achievement but will fall further and further behind their peers in the state over time.

The share of underperforming charter schools is offset, however, by the proportions of charter schools that are either already achieving at high levels or are in positions to reach those levels. In both reading and math, a majority of charter schools have academic growth that is above the average for all schools in New Jersey. For reading, the proportion is over 60 percent and for math it exceeds 70 percent. Should these trends continue, the share of schools that currently lag the state average for absolute achievement would be expected to decline. These absolute improvements are within sight in New Jersey.

Table 7 below presents a summary of the results.

Table 7: Summary of Statistically Significant Findings for Average Learning Gains of New Jersey Charter School Students Compared to the Average Learning Gains for VCR Students

	Reading	Math
New Jersey Charter Students	Positive	Positive
Newark	Positive	Positive
Other Major Cities	Negative	
Urban Students	Positive	Positive
Suburban Students	Positive	Positive
Rural Students	Negative	Negative
Elementary Charter Schools	Positive	Positive
Middle Charter Schools	Positive	Positive
Multi-Level Charter Schools	Positive	Positive
Charter Schools Age 1 – 2 Years	Positive	Positive
Charter Schools Age 3 – 4 Years	Positive	Positive
Charter Schools Age 5 – 6 Years		Positive
Charter Schools Age 7 – 8 Years	Positive	Positive
Charter Schools Age 9 or More Years	Positive	Positive
First Year Enrolled in Charter School	Positive	Positive
Second Year Enrolled in Charter School	Positive	Positive
Third Year Enrolled in Charter School	Negative	Negative
Black Charter School Students	Positive	Positive
Hispanic Charter School Students	Positive	Positive
Charter School Students in Poverty		Positive
Black Charter School Students in Poverty	Positive	Positive
Hispanic Charter School Students in Poverty	Positive	Positive
English Language Learner Charter School Students		Positive
Charters in 2008	Positive	Positive
Charters in 2009	Positive	Positive
Charters in 2010		Positive
Charters in 2011	Positive	Positive

Note: When an entry is blank, that result was not significant.

The large proportion of charter schools that outperform their local markets has two implications. First, the proportion of strong charter schools versus sub-par ones suggests that New Jersey has been fortunate to have a constructive combination of policies that attracted numerous charter school operators to the state. The importance of a constructive policy environment for charter schools cannot be overstated.

Many charter school operators, in turn, have used the flexibility and autonomy that is afforded them to positive effect. The substantial proportion of high-growth and high achieving schools provide the evidence that schools can be organized to produce strong results under current conditions. Second, and perhaps more importantly, these schools are excelling with a high proportion of minority students in poverty. These schools' practices may be instructive for other public schools that also serve this student group.

The charter school results presented in this report place New Jersey among the highest performing states studied to date. They show that important foundations for quality are in place and working. With continued focus on student- and school-level performance, charter schools in New Jersey can continue to serve an important role in providing strong academic options for the students they serve.

Appendix

The numbers in the table below represent the number of charter observations associated with the corresponding results in the report. An equal number of VCRs were included in each analysis.

Student Group	Matched Charter Students	
	Reading	Math
New Jersey Charter Students	16,486	16,547
Students in Newark	3,853	3,887
Students in Other Major Cities	4,728	4,719
Students in Charters in 2008	1,182	1,141
Students in Charters in 2009	3,374	3,257
Students in Charters in 2010	5,831	5,495
Students in Charters in 2011	6,549	6,654
Students in Urban Schools	8,581	8,606
Students in Suburban Schools	7,215	7,258
Students in Rural Schools	690	683
Students in Elementary Schools	8,476	8,505
Students in Middle Schools	4,504	4,517
Students in Multi-level Schools	3,026	3,051
Students in Charters Age 1 - 2 Years	2,126	2,124
Students in Charters Age 3 - 4 Years	1,695	1,709
Students in Charters Age 5 - 6 Years	978	979
Students in Charters Age 7 - 8 Years	1,570	1,567
Students in Charters Age 9 or More Years	10,117	10,168
Students First Year Enrolled in Charter School	4,367	4,406
Students Second Year Enrolled in Charter School	1,270	1,297
Students Third Year Enrolled in Charter School	380	376
Black Students	10,020	10,001
Hispanic Students	4,751	4,781
Students in Poverty	12,515	12,251
Black Students in Poverty	8,036	8,046
Hispanic Students in Poverty	4,175	4,170
Special Education Students	1,422	1,389
English Language Learners	108	120
Grade Repeating Students	60	72

Student Group	Matched Charter Students	
	Reading	Math
Students in Decile 1	2,578	2,946
Students in Decile 2	2,652	2,733
Students in Decile 3	2,096	2,269
Students in Decile 4	2,003	1,799
Students in Decile 5	1,974	1,656
Students in Decile 6	1,495	1,456
Students in Decile 7	1,345	1,182
Students in Decile 8	1,213	1,008
Students in Decile 9	789	895
Students in Decile 10	341	603