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National Charter School Study

2013

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CENTER FOR RESEARCH ON EDUCATION OUTCOMES

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CREDO, the Center for Research on Education Outcomes at Stanford University, was established to improve empirical evidence about education reform and student performance at the primary and secondary levels. CREDO at Stanford University supports education organizations and policymakers in using reliable research and program evaluation to assess the performance of education initiatives. CREDO's valuable insight helps educators and policymakers strengthen their focus on the results from innovative programs, curricula, policies and accountability practices.

Acknowledgements

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List of Acronyms

CMOs	Charter School Management Organizations
CREDO	Center for Research on Education Outcomes
EOC	End-of-Course Exam
ELA	English Language Arts
ELLs	English Language Learners
FERPA	Family Education Records Privacy Act
NAEP	National Assessment of Educational Progress
TPS	Traditional Public School
VCR	Virtual Control Record

National Charter School Study **2013**

1. Introduction

Charter schools continue to play a central role in education reform efforts across the United States. Charter school students now comprise more than four percent of the total public school population in the United States, a proportion that continues to grow every year. There are estimated to be over 6,000 charter schools serving about 2.3 million students in the 2012-2013 school year.[1] This represents an 80 percent increase in the number of students enrolled in charter schools since CREDO released its first national report on charter school performance in 2009, *Multiple Choice: Charter School Performance in 16 States*.[2]

With the recent adoption of a charter school law in Washington State, 42 states and the District of Columbia now allow charter schools. Many states with charter laws already on the books are strengthening their laws or expanding the scope of charter authorizing. One area of expansion concerns school turnaround efforts, some of which include charter schools as an integral part of the process. Failing traditional public schools in places like New Orleans, Louisiana, and Memphis, Tennessee, are being closed and wholly replaced with autonomous charter schools. Expectations are high for these new charters, in accordance with the charter school model, as these schools face closure if they cannot deliver acceptable results.

Given expanded interest in charter schools as an instrument of education reform, more than ever there is need for information about charter school performance. In the four years since *Multiple Choice*, CREDO has analyzed charter school performance in several additional states and released a report on the topics of charter school growth and replication. In addition, other researchers have published studies evaluating charter school performance in various locations as well as studies of charter

[1] National Alliance for Public Charter Schools (2013). "Dashboard; A Comprehensive Data Resource from the National Alliance for Public Charter Schools." Washington, DC. Retrieved 12 January, 2013, from: http://dashboard.publiccharters.org/dashboard/schools/page/overview/year/2012)

[2] Center for Research on Education Outcomes (2009). "Multiple Choice: Charter School Performance in 16 States. Stanford, CA, CREDO at Stanford University." Stanford University, Stanford, CA. Available from: http://credo.stanford.edu/reports/MULTIPLE_CHOICE_CREDO.pdf

management organizations and their performance.[3] However, there has not been a comprehensive look at the impacts of charter schools on student academic performance in a few years.

This report provides an updated and expanded view of charter school performance in the United States. All states that were included in the 2009 report have continued their participation: Arkansas, Arizona, California, Colorado (now expanded to include the entire state outside Denver), the District of Columbia, Florida, Georgia, Illinois (also expanded to include the entire state outside Chicago), Louisiana, Massachusetts, Minnesota, Missouri, New Mexico, North Carolina, Ohio, and Texas. The participating state education departments that are new to the study include: Indiana, Michigan, Nevada, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Tennessee, and Utah. Together, the participating states educate over 95 percent of the nation's charter school students.

There are two different types of analysis presented in this report. First, picking up where *Multiple Choice* left off, current outcomes are reported from charter schools in the same 16 states that were

[3] For example, see the following:
Abdulkadiroglu, A., Angrist, J., Dynarski, S., Kane, T. & Pathak, P. (2010). "Accountability and Flexibility in Public Schools: Evidence from Boston's Charters and Pilots". Quarterly Journal of Economics, V. 126 (2). Retrieved 12 March, 2012, from: http://qje.oxfordjournals.org/content/126/2/699.full
Center for Education Policy Research (2011). "Student Achievement in Massachusetts' Charter Schools". The Center for Education Policy Research, Harvard University, Cambridge, MA. Retrieved 12 March, 2012 from:
http://www.gse.harvard.edu/~pfpie/pdf/Student_Achievement_in_MA_Charter_Schools_2011.pdf
Gleason, P., Clark, M., Tuttle, C.C., & Dwoyer, E. (2010). "The Evaluation of Charter School Impacts: Final Report (NCEE 2010-4029)". National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education, Washington, DC. Retrieved 16 March, 2012, from: http://www.mathematica-mpr.com/publications/pdfs/education/charter_school_impacts.pdf
Mathematica Policy Research Group & Center on Reinventing Public Education (2012). "The National Study of Charter Management Organization (CMO) Effectiveness; Charter Management Organizations: Diverse Strategies and Diverse Student Impacts." Mathematica Policy Research Group, Washington, D.C. & Center on Reinventing Public Education, University of Washington. Retrieved 12 February, 2012, from: http://www.crpe.org/sites/default/files/pub_cmofinal_Jan12_0.pdf
Mathematica Policy Research (2013). "KIPP Middle Schools: Impacts on Achievement and Other Outcomes". Mathematica, Washington, DC. Retrieved 11 February, 2013, from:
http://www.mathematica-mpr.com/publications/pdfs/education/KIPP_middle.pdf
Miron, G. (2011). Review of "Charter Schools: A Report on Rethinking the Federal Role in Education." Boulder, CO: National Education Policy Center. Retrieved 14 June, 2013, from
http://nepc.colorado.edu/thinktank/review-charter-federal

covered in the 2009 report. Along with an updated view of the charter sector in those states, this chapter separates the current impacts for the charter schools that were included in the 2009 report and impacts of newer charter schools in the 16 states. The primary aim of this chapter is to determine whether trends in charter school performance can be identified.

The second set of analyses in the report is a new examination that includes all 27 partner states.[4] The aim of this chapter is to provide contemporary answers to the following research questions:

1. What are the current learning gains for charter schools, and what is the trend for those gains?
2. How well do students in charter schools progress compared to their traditional public school counterparts? Is there significant variation in how charter schools perform around the country?
3. How well do students in select groups of interest, including minority students, those in poverty, English language learners or special education, fare in charters compared to what they otherwise would have gained in TPS?
4. Are charter schools closing the achievement gap for students?

In the aggregate, both reading and math results show improvement compared to the results reported in *Multiple Choice.* The analysis of the pooled 27 states shows that charter schools now advance the learning gains of their students' more than traditional public schools in reading. Improvement is seen in the academic growth of charter students in math, which is now comparable to the learning gains in traditional public schools. On average, students attending charter schools have eight additional days of learning in reading and the same days of learning in math per year compared to their peers in traditional public schools. In both subjects, the trend since 2009 is on an upward trajectory, with the relative performance of the charter sector improving each year. Related results for different student groups indicate that black students, students in poverty, and English language learners benefit from attending charter schools. However, charter school quality is uneven across the states and across schools. These findings are supported by a number of related analyses, including the update on the 16 states first studied in 2009.

[4] We received data from 25 states and the District of Columbia. The demographics, performance, and size of New York City (NYC) make it a unique sub-population from New York State. As such, the analyses in this report treated NYC as a separate state-level entity. The District of Columbia (DC), which has its own distinct education system, is also treated as a state. All references to the number of states count NYC and DC as independent states.

2. Methods and Data

Since the 2009 study, *Multiple Choice: Charter School Performance in 16 States*, CREDO has continued to refine our matching and analysis techniques and expanded our data collections.[5] This chapter provides a non-technical overview of the data sources and analytic techniques used in the current study. The chapter presents general descriptions of the data sources used in the current study and explanations of how the study was organized and executed. Greater scientific detail on these topics is included in the Technical Appendix to this report.

For this study, CREDO partnered with 27 state departments of education to use both their student and school level data. In the case of Colorado and Illinois, the agreements expanded the scope of earlier district-level agreements so that the present study includes all charter students statewide.[6] The resulting dataset included 79 percent of tested public school students in the United States, making it one of the largest datasets of student-level observations created to date. We used this information to create a matched student dataset with over 5,000,000 student-level observations from 1,532,506 charter students and a matched comparison group.

Our partnerships with the 27 individual states depend on negotiated data sharing agreements. One common requirement across all agreements is that the processing, analysis, and security of the student-level data had to meet the requirements of the Federal Education Rights and Privacy Act (FERPA). This study is fully compliant with FERPA regulations as interpreted by each state providing data.

Clearly, no single study can provide the definitive analysis on a topic as broad as the effectiveness of charter schools. Only by accumulating evidence from multiple studies does a solid body of evidence emerge. With this expansion and update to CREDO's earlier work, we aim to add to the growing array of studies about charter schools and their impact on the academic outcomes of the students who attend them. In doing so, we strived to create a study that was both as rigorous and as balanced as possible.

Consolidating Student Data from Multiple States

This study built on the methodology used in the 2009 study. The data collected for this study consisted of student-level demographics, school enrollment and achievement test scores in reading/English language arts (ELA) and math.[7] Since the implementation of No Child Left Behind, both reading and math tests have been given consistently across grades 3-8. However, testing is less consistent across other grades.

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[5] The states included in the 2009 study were: Arkansas, Arizona, California, Denver (CO), D.C., Florida, Georgia, Chicago (IL), Louisiana, Massachusetts, Minnesota, Missouri, New Mexico, North Carolina, Ohio, and Texas.

[6] The 2009 study included only Chicago and Denver students respectively.

[7] We do not extend the analysis to include science as the consistency of such tests across the county is not yet sufficiently robust to support the consolidated analysis we typically conduct.

Many states had early elementary or high school testing. High school testing often took the form of an end-of-course (EOC) exam, which was tied to course enrollment rather than a student's grade. These EOC tests differed by state in several ways that could impact growth estimates. These variations included the grade in which the EOC exam was given, the number of times a student is allowed to take the EOC exam, and the time gap between the EOC tested grade and the previous tested grade. All of these factors had to be taken into account when constructing our data set. Due to these concerns, specifically the gap between tested grades, some states' EOC test scores was not included in the data. Table 1 shows the grades and EOCs included for each state.

Table 1: Tested Grade by State

	Grade												
State	1	2	3	4	5	6	7	8	9	10	11	12	EOCs
Arizona			X	X	X	X	X	X		X			
Arkansas			X	X	X	X	X	X					Algebra, Geometry
California		X	X	X	X	X	X	X	X	X	X		Algebra 1, Algebra 2, Geometry, General Math, High School Math, Integrated Math 1, Integrated Math 2, Integrated Math 3
Colorado			X	X	X	X	X	X	X	X			
District of Columbia			X	X	X	X	X	X		X			
Florida			X	X	X	X	X	X	X	X			
Georgia	X	X	X	X	X	X	X	X			X		American Literature, 9Th Grade Literature, Algebra 1, Geometry
Illinois			X	X	X	X	X	X					
Indiana			X	X	X	X	X	X		X			Algebra 1
Louisiana			X	X	X	X	X	X					English 1, Algebra 1, Geometry, Graduation Exit Exams
Massachusetts			X	X	X	X	X	X		X			
Michigan			X	X	X	X	X	X					
Minnesota			X	X	X	X	X	X		X	X		
Missouri			X	X	X	X	X	X					Algebra 1, Algebra 2, English 1, English 2
North Carolina			X	X	X	X	X	X					Algebra 1, Algebra 2, Geometry, English 1

State	Grade												EOCs
	1	2	3	4	5	6	7	8	9	10	11	12	
New Jersey			X	X	X	X	X	X					
New Mexico			X	X	X	X	X	X					
Nevada			X	X	X	X	X	X					High School Proficiency Exam
New York			X	X	X	X	X	X					Algebra 1, Algebra 2, Geometry
New York City			X	X	X	X	X	X					Algebra 1, Algebra 2, Geometry
Ohio			X	X	X	X	X	X		X			
Oregon			X	X	X	X	X	X		X			
Pennsylvania			X	X	X	X	X	X					
Rhode Island			X	X	X	X	X	X					
Tennessee			X	X	X	X	X	X					Algebra 1, English 1, English 2
Texas			X	X	X	X	X	X	X	X	X		
Utah			X	X	X	X	X	X	X	X	X		Pre Algebra, Algebra 1, Algebra 2, Geometry

From each two-year combination of individual student data, we were able to calculate a measure of academic growth. Growth is the change in each student's score from one school year to the next school year. As most of the partner states began to collect uniquely-identified student-level data by 2005, we were able to compute complete growth data from the 2006-07 school year through the 2010-11 school year. There are three states missing at least one year of data. New Jersey and Pennsylvania did not have growth data for the 2006-07 year, and CREDO does not have Illinois growth data from 2006-07 through 2008-09. Table 2, seen below, shows the years with growth data by state.

Table 2: Years with Growth Data by State

State	School Year				
	2006-07	2007-08	2008-09	2009-10	2010-11
Arizona	X	X	X	X	X
Arkansas	X	X	X	X	X
California	X	X	X	X	X
Colorado	X	X	X	X	X
District of Columbia	X	X	X	X	X
Florida	X	X	X	X	X
Georgia	X	X	X	X	X
Illinois				X	X
Indiana	X	X	X	X	X
Louisiana	X	X	X	X	X
Massachusetts	X	X	X	X	X
Michigan	X	X	X	X	X
Minnesota	X	X	X	X	X
Missouri	X	X	X	X	X
North Carolina	X	X	X	X	X
New Jersey		X	X	X	X
New Mexico	X	X	X	X	X
Nevada	X	X	X	X	X
New York	X	X	X	X	X
New York City	X	X	X	X	X
Ohio	X	X	X	X	X
Oregon	X	X	X	X	X
Pennsylvania		X	X	X	X
Rhode Island	X	X	X	X	X
Tennessee	X	X	X	X	X
Texas	X	X	X	X	X
Utah	X	X	X	X	X

For this study, we combine the data from all 27 states into a single dataset. The data was processed in a way that takes into consideration the differences in test measurement scales across states, thereby allowing us to turn the 27 individual states' results into a single common set of measures. This process makes it possible for us to study the same effects in the same way and thus places all the participating states on a common footing. From this common footing, we are able to make comparisons between states as well as within them.

Selection of Comparison Observations

As in the 2009 study, this study employed the virtual control record (VCR) method of analysis developed by CREDO. The VCR approach creates a "virtual twin" for each charter student who is represented in the data. In theory, this virtual twin would differ from the charter student only in that the charter student attended a charter school. The VCR matching protocol has been assessed against other possible study designs and judged to be reliable and valuable by peer reviewers. Details of these assessments of the VCR method are presented in the Technical Appendix.

Using the VCR approach, a "virtual twin" was constructed for each charter student by drawing on the available records of traditional public school (TPS) students with identical traits and identical or very similar prior test scores who were enrolled in TPS that the charter students would have likely attended if they were not in their charter school.[8]

Click here for an infographic about the Virtual Control Record method.

Factors included in the matching criteria were:

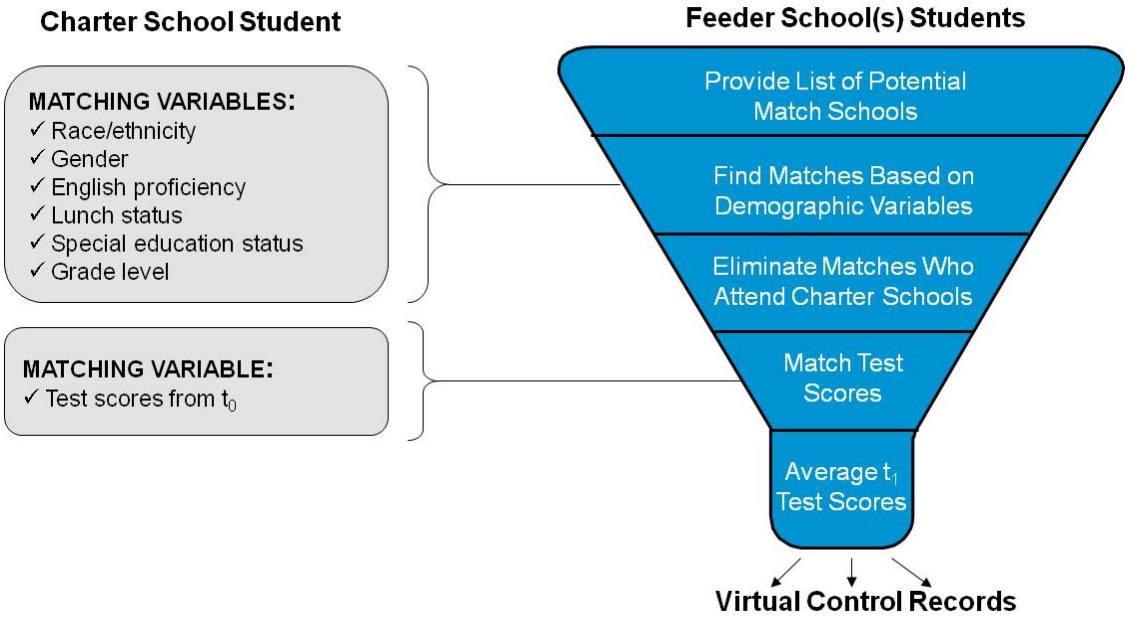
- Grade level
- Gender[9]
- Race/Ethnicity
- Free or Reduced-Price Lunch Eligibility
- English Language Learner Status
- Special Education Status
- Prior test score on state achievement tests

Figure 1 shows the matching process used by CREDO to create the virtual twins linked to each charter school student. In the first step, CREDO identifies all TPS with students who transferred to a given charter school. These schools are referred to as "feeder schools" for that charter. Students attending a

[8] The majority of VCRs included only test scores which were exact matches. Non-exact matches must be within 0.1 standard deviations to be included as part of a VCR.
[9] Gender is used as a match factor for all states except Florida due to lack of data availability.

charter feeder school are eliminated from the match pool for each charter student to ensure VCRs consist entirely of TPS students. The feeder school method provides a strong counterfactual as residential school assignment commonly used to place students in TPS has been shown to group demographically and socio-economically similar students into schools. This practice increases the likelihood that students assigned to similar schools have similar backgrounds, knowledge of school choice programs, and school choice options. Once a school is identified as a feeder school for a particular charter, all the students in that TPS become potential matches for students in the charter school. All of the student records from all of a charter's feeder schools were pooled – this became the source of records for creating the virtual twin match.

Figure 1: CREDO VCR Methodology



The VCR matching method then eliminates any of the remaining TPS students whose demographic characteristics do not match exactly and who did not have an identical or similar prior test score. As part of the match process, we also drop from the TPS match pool any students who enrolled in a charter school in subsequent years.

Using the records of TPS students at feeder schools in the year *prior* to the first year of growth, CREDO randomly selects up to seven TPS students with identical values on the matching variables in Figure 1, including identical or very similar prior test scores. Students with similar test scores were used only when there were not enough TPS students with exact test score matches. The values for the selected TPS students are then averaged to create values for the virtual twin. As all other observable characteristics are identical, the only characteristic that differs between the charter student and their VCR is attendance in a charter school. Thus we concluded that any differences in the post-test scores

are primarily attributable to charter school attendance. The match process was conducted separately for reading and math. Table 3 below displays the proportion of charter students in each state for whom CREDO was able to create a VCR.

Table 3: Percent of Charter School Students with Matches

State	Reading	Math
Pooled Average	**86.2%**	**84.1%**
Arizona	74.5%	74.3%
Arkansas	88.8%	81.7%
California	89.4%	83.4%
Colorado	88.9%	88.4%
District of Columbia	82.6%	80.0%
Florida	88.0%	88.1%
Georgia	93.0%	91.1%
Illinois	89.9%	90.2%
Indiana	85.8%	84.0%
Louisiana	86.6%	86.2%
Massachusetts	76.9%	80.8%
Michigan	83.0%	84.6%
Minnesota	78.8%	76.7%
Missouri	79.0%	79.1%
Nevada	76.3%	76.6%
New Jersey	73.2%	72.7%
New Mexico	75.9%	75.5%
New York	84.1%	81.9%
New York City	85.4%	84.2%
North Carolina	81.1%	74.9%
Ohio	77.8%	78.7%
Oregon	79.6%	80.6%
Pennsylvania	86.5%	86.3%
Rhode Island	77.5%	74.4%
Tennessee	96.0%	95.1%
Texas	89.5%	90.0%

State	Reading	Math
Utah	91.0%	86.1%

VCRs were re-examined in every subsequent test period to ensure that the conditions of the match still applied – namely that the students included in the VCR record were still enrolled in TPS and had not left the state. In cases where the conditions were violated, the VCR was reconstructed to delete the disqualified student records. This process allowed CREDO to follow the matched pairs over as many years as possible while maintaining the integrity of the match.

There were some circumstances that resulted in a charter student not finding an acceptable match. Students were not matched in the first year for which they had test data, since a prior score was required for matching. This restriction removed the first tested grade in each state from the analysis as well as the first year for students who relocated to a new state. It is also possible students could have all of their initial matches invalidated due to changes among their TPS matches. In those cases, students were re-matched with a new VCR when possible. Additionally, the tight match restrictions of the VCR protocol occasionally limited the number of possible matches.

Fair Analysis of Impacts on Student Academic Progress

Most researchers agree that the best method of measuring school effectiveness is to look at their impact on student academic growth, independent of other possible influences. The technical term for this is "value-added."[10] The central idea is that schools should be judged on their direct contribution to student academic progress. This necessarily takes into consideration the students' starting scores on standardized tests as well as student characteristics that might influence academic performance. This approach forms the foundation of our study design.

In order to conduct a fair analysis, this study followed the approach of the 2009 study: we looked at the academic growth of individual students as reflected in their performance on state achievement tests in both reading and math. To assure accurate estimates of charter school impacts, we use statistical methods to control for differences in student demographics and eligibility for categorical program support such as free or reduced-price lunch eligibility and special education. In this way, we have created the analysis so that differences in the academic growth between the two groups are a function of which schools they attended.

While we went to great efforts in each state to match the charter students and their virtual twins, it is important to recognize that states differ in the location of charter schools and the students they serve. These differences mean that charter students are not likely to be representative of the state's full complement of students. These differences are described in the Demographics chapter. Our statistical

[10] Betts, J. R. and Y. E. Tang (2008). "Value-added and experimental studies of the effect of charter schools on student achievement." Center on Reinventing Public Education, Seattle, WA. Retrieved 12 May, 2012, from: http://www.econ.ucsd.edu/~jbetts/Pub/A58%20pub_ncsrp_bettstang_dec08.pdf

models included controls for these differences between states to take these differences into account when estimating the overall impact of charter school attendance.

Basic Analytic Models

The purpose of this study is to address multiple questions, all focused around one central question, "How did the academic growth of charter school students compare to similar students who attended traditional public schools (TPS)?" By answering this foundational question, we hope to extend the pool of knowledge on charter school effectiveness and provide solid information for policy makers.

This report presents two discrete studies. First, we studied the change in performance for the states that were covered in the 2009 report; this section is referred to as the Original 16-State Update. Second, we created a contemporary analysis of the effectiveness of charter schools in the 27 states with whom we have data partnerships, called the 27-State Analysis. Each study is briefly previewed below. An explanation of the basic model used for each analysis is included in the Technical Appendix.

Original 16-State Update – This study examines how performance has changed over time in the 16 states covered in the 2009 CREDO study. We contrast the academic growth for charter school students in two time periods – the years covered by the 2009 report (i.e., through the 2007-08 school year) to performance in the years since that time (denoted as 2013 throughout the report). In addition to the view of all charter schools in 2013, there are two distinct charter school groups contained within the 2013 results: continuing schools and new schools. Continuing schools are those that were included in the 2009 report, while new schools are the newly opened or newly tested schools in the 16 original states that were not included in the 2009 report. In addition to the results for all schools in 2013, results for continuing and new schools are also discussed to provide the full picture of current charter school performance within the original 16 states.

27-State Analysis – The 27-state analysis is a new analysis on the charter sector as it currently exists based on the most recent data available. This section is a wide-angle study to evaluate the impact of charter attendance on academic growth compared to the academic growth the students would have achieved had they not enrolled in charter schools. The impacts are studied in the aggregate – all charter students versus their virtual twins. The study further examines the academic results for students across a number of student subgroups and characteristics. This analysis largely parallels the 2009 study.

Presentation of Results

Throughout the analyses included in this study, we present the effect of attending charter schools in two ways. First, we provide the difference in growth in terms of standard deviations. These are the actual outputs of the statistical methods used for each analysis. To make these results more meaningful to non-technical readers, we also include a transformation of the results in days of learning. As with standard deviations, the days of learning metric is expressed relative to the academic gain of

the comparison student in a given year. Table 4 shows a sample of standard deviations and their associated days of learning. Positive standard deviations are expressed as additional days of learning; negative standard deviations are associated with fewer days of learning. For those wanting to convert these larger counts into weeks or months: a school week consists of five days, a school month is 20 days, and a quarter or 9-weeks term is typically 45 days.

While transforming the statistical results into days of learning provides a more accessible measure, the days of learning are only an estimate and should be used as general guide rather than as empirical transformations.[11]

Table 4: Transformation of Average Learning Gains

Growth (in Standard Deviations)	Days of Learning
0	0
0.005	4
0.01	7
0.02	14
0.04	29
0.05	36
0.10	72
0.15	108
0.20	144
0.25	180
0.30	216
0.35	252
0.40	288

[11] Hanushek, E. A. and S. G. Rivkin (2006). "Teacher Quality." In . E. A. Hanushek and F. Welch (Eds.), Handbook of the Economics of Education, Vol. 2. (pp. 1051-1078). Amsterdam, North Holland. Retrieved 22 March, 2012, from:http://hanushek.stanford.edu/sites/default/files/publications/Hanushek%2BRivkin%202006%20HbEEdu%202.pdf

3. Charter School Demographics

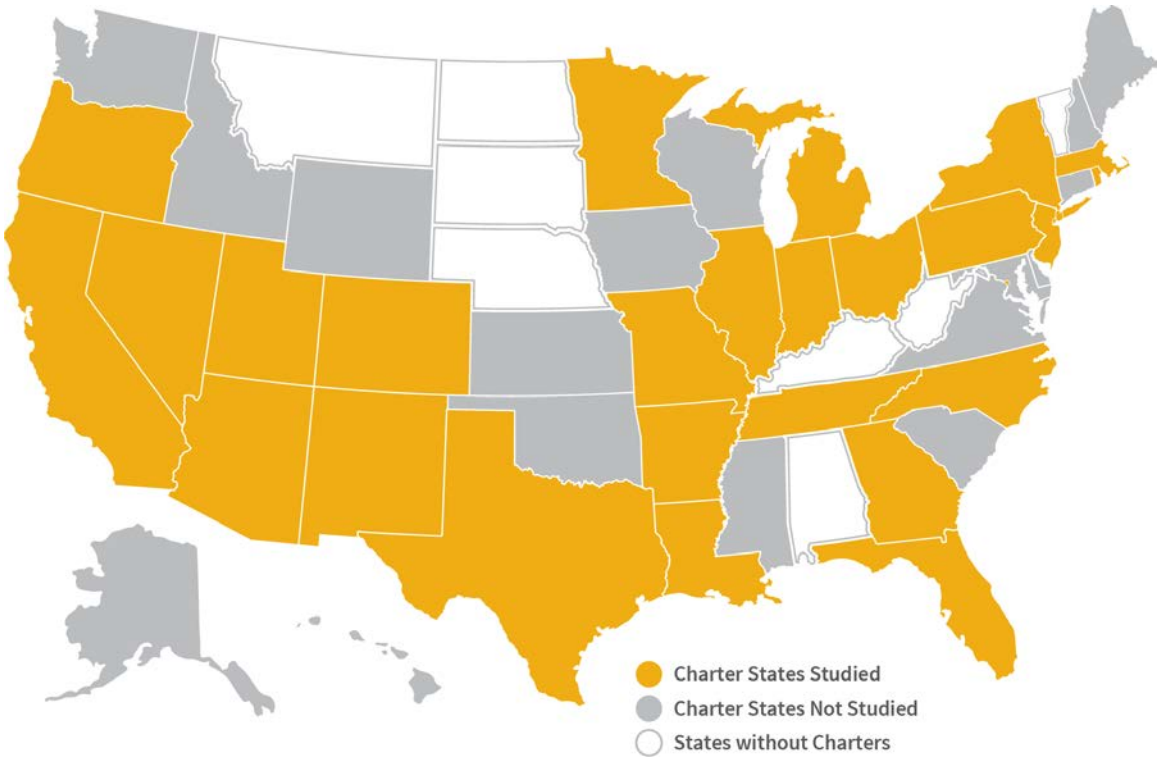
There are two aims to this chapter. The first is to place this study in the context of the broader educational landscape in the United States. Beginning with a wide-angle view of the students in all public schools and all charter schools, we gradually narrow the focus to the charter students included in this study, making comparisons along the way. This will determine how well the charter students in this study represent the entire population of students in charter schools. If they are representative, the findings will more accurately represent the average charter experience in the United States.

The second aim is to provide background information to aid understanding of the results presented in the chapters that follow. To this end, the student and school characteristics used in the results are fully described and trends in the data are highlighted. In addition to looking at student characteristics, such as race/ethnicity and special education status, the distribution of students across grade spans, locations and independent versus managed charter schools is also reported. All 27 states are included in these breakouts. Changes in student demographics and starting scores are also examined for the 16 states included in the 2009 CREDO study. For the interested reader, the Supplementary Findings Appendix contains further descriptions of the students included in this study.

Since charter schools began in Minnesota in 1991, the majority of states have passed legislation allowing the formation of charter schools. As of this writing, only eight states do not have charter school laws on the books. Three states – Maine, Mississippi and Washington – passed charter school laws recently and do not yet have sufficient data to be included in the impact analysis. All but 13 of the states with charter laws and available data are included in the current study. This is a marked increase over the 16 states included in the 2009 study. The map in Figure 2 shows the states that are included in the current study.

Click here for an interactive map of charter states.

Figure 2: States with Charters



In 2009, the 16 states that were included in the study educated over 70 percent of all charter students in the United States. Over 95 percent of all charter students are educated in the 27 states that participated in the current study.[12,13] A comparison of the demographic profiles of the total public school population in the United States – in both traditional public and charter schools, all US charters, and the 27 states from this study can be found in Table 5 below.

[12] National Alliance for Public Charter Schools (2013). "Dashboard; A Comprehensive Data Resource from the National Alliance for Public Charter Schools." Washington, DC. Retrieved 12 January, 2013, from: http://dashboard.publiccharters.org/dashboard/students/page/overview/year/2012

[13] National Center for Education Statistics (2010). "Core of Data Public School Universe data." U.S. Department of Education, Institute of Education Sciences, Alexandria, VA. Retrieved 16 December, 2012, from: http://nces.ed.gov/ccd/pubschuniv.asp

Table 5: Demographic Comparison of Students in All US Public Schools, US Charter Schools, and Charters in the 27 States, 2010-11

	All US Public	US Charters	27 State Charters
Number of Schools	99,749	5,274	5,068
Total Number of Students Enrolled	49,177,617	1,787,466	1,704,418
Students in Poverty	48%	53%	54%
English Language Learners	6%	N/A	9%
Special Education Students	13%	N/A	8%
White Students	52%	36%	35%
Black Students	16%	29%	29%
Hispanic Students	23%	27%	28%
Asian/Pacific Islander Students	5%	3%	3%
Other Students	4%	4%	4%

N/A: Data is not available at this level of disaggregation for this student group.[14]

Charter schools in the United States educate a higher percentage of students in poverty (as indicated by free or reduced price lunch eligibility) than all US public schools, as shown in Table 5. While about half of all public school students are white, this proportion is much smaller in US charter schools (slightly over one-third). Conversely, a much larger proportion of charter students are black than in all public schools. The proportion of Hispanic students is slightly larger in charter schools than all public schools as well. The proportions of charter students in the 27 states charter schools are similar to those in all US charters. In addition, the 27 included states have a higher proportion of students who are English language learners and a lower proportion of special education students than are in all US public schools.

Charter Schools in the 27 states

The table above shows that students attending charter schools in the 27 states are representative of the country's charter school student population but differ from the total public school student population. How, though, do these charter school students compare to the other public school students in their own states? Some states permit charter schools to open only in areas of greatest educational need (e.g., in failing school districts or to replace failing schools), while in other states

[14] Data on English language learners and special education students is available by state for all public schools from the National Center for Education Statistics, but it is not disaggregated to the school level to allow for computations by charter designation. For the 27 states, CREDO collected these data at the school level from each state education department and compiled the proportions for charter schools in those states.

charters can choose their location and whether to concentrate in these areas. Because of this, charter school demographics may differ from the traditional public schools (TPS) in each state. The other side of the choice equation, student and parental choice, comes into play when considering whether charters will be demographically similar to their feeder schools – that is, the traditional public schools that the students attend prior to enrolling in a charter school. Charter school programs may appeal more to certain students and parents than others, and this may lead to different student populations at feeders and charters. Table 6 compares the student populations of all 27 states' traditional public schools, the charters' feeder schools, and the charter schools themselves.[15]

Table 6: Demographic Comparison of Students in TPS, Feeders and Charters in the 27 States, 2010-11

	TPS	Feeders	Charters
Number of schools	67,817	29,797	5,068
Average enrollment per school	537	677	336
Total number of students enrolled	36,438,832	20,172,202	1,704,418
Students in Poverty	49%	54%	54%
English Language Learners	10%	13%	9%
Special Education Students	12%	11%	8%
White Students	50%	40%	35%
Black Students	15%	17%	29%
Hispanic Students	27%	34%	28%
Asian/Pacific Islander Students	5%	5%	3%
Native American Students	1%	1%	1%

The table above shows that there are some notable differences between the charter student population and both the TPS and feeder schools in this analysis. There is a higher proportion of students in poverty at charter schools than at the traditional public schools. However, charter schools have a similar proportion of students in poverty to their feeder TPS.

The proportions of student races and ethnicities are very different among the three school groups. Charter schools enroll the highest proportion of black students of the three groups. Hispanic students are represented in similar proportions at charter schools compared to TPS, but this proportion is lower than the ratio of Hispanic students at feeder schools. There are fewer white students at charters than at either feeder TPS or all TPS.

[15] National Center for Education Statistics (2010). "Core of Data Public School Universe data." U.S. Department of Education, Institute of Education Sciences, Alexandria, VA. Retrieved 16 December, 2012, from: http://nces.ed.gov/ccd/pubschuniv.asp

English language learners comprise a smaller proportion of the charter school student population than at feeders or all TPS. In addition, a smaller proportion of the charter school population is designated as special education than at either the feeders or TPS as a whole. This phenomenon may be due to parents of students with special needs choosing TPS upon determining it is better-equipped than the local charter school options to meet their children's needs. Another possibility is that charter schools use different criteria than traditional public schools to determine whether a student qualifies for a formal special education designation.

Matched Charter Students in the 27 states

The differences in student populations between all TPS and charter schools – and even feeder schools and charters – complicate the ability to make performance comparisons based on school-level data. As described above, the CREDO solution to this problem is to use the VCR methodology to match charter students with "twins" from feeder schools. We were able to match about 85 percent of charter students with at least one growth period in our data. We consider the sample of matched charter school students to be sufficiently representative of the full sample if there is less than a five-percentage point difference between the full-sample proportion of the student group and the matched-student proportion of the same student group. The demographic profile of the matched charter student population compared to the total charter student population in the 27 states can be found in Table 7 below.

Table 7: Demographic Comparison of Charters and Matched Students

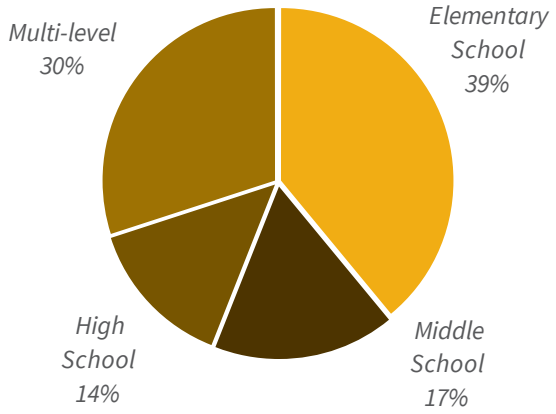
	All Charter Students	Matched Charter Students
Number of Schools	5,068	3,670
Students in Poverty	54%	55%
English Language Learners	9%	6%
Special Education Students	8%	6%
White Students	35%	37%
Black Students	29%	27%
Hispanic Students	28%	30%
Asian/Pacific Islander Students	3%	3%
Native American Students	1%	0.3%

The matched charter student population looks similar to the demographic profile of all charter students, although there are a few noteworthy differences. There is a slightly higher proportion of

matched students in poverty than for all charter students. In addition, the ratio of black students and Hispanic students in the matched group is smaller than their proportion among all students. A lower proportion of matched students are English language learners or special education students than the overall charter population as well. Because these students are more likely to be tested using alternative methods, they are both less likely to appear in the regular state assessment data we receive and, due to the smaller pool of similar students in their TPS feeders, finding matches for them is more difficult. However, the matched student proportions of all the student groups are similar enough to the charter population for the 27 states to be confident that the results are accurate portrayals of charter performance in those states.

It is worth noting that the charter student population for the 27 states masks the underlying differences in the charter student populations across the states. For example, the proportion of black students ranges from less than one percent of the charter student population in Utah to 94 percent in the District of Columbia. Similarly, Hispanic students make up about one percent of the Tennessee charter student population but 59 percent of New Mexico's. There is also a wide range of charter students in poverty – from 18 percent in Nevada to 90 percent in Missouri. The full student demographic profiles by state are available in the Supplementary Findings Appendix.

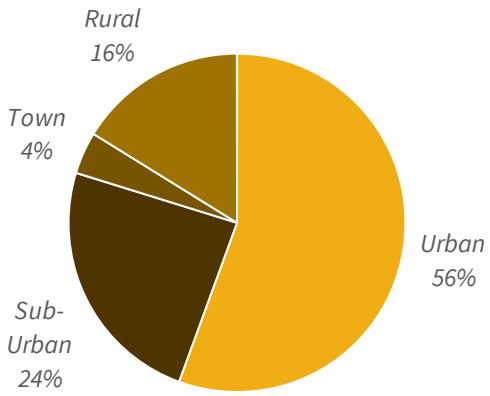
Figure 3: Charter Students by Grade Span in the 27 States



Another difference in the data that is not apparent from the student demographic profiles is the proportion of charter students in each grade span. These percentages are shown in Figure 3 above. Nearly 40 percent of students in the data were from elementary charter schools. Nearly one-third of students attended multi-level schools, which are charters that serve students from more than one grade span, such as schools serving grades K-12. The proportions of students from middle and high schools are smaller than the other two grade spans. As discussed in Data and Methods, however, high school students are not able to be included for six of the 27 states due to high school assessment schemes that prevent the accurate calculation of academic growth. Because of this limitation, the

findings for students in charter high schools may not generalize to the average charter high school experience.

Figure 4: Charter Students by Location in the 27 States



Much media attention has focused on charter schools in urban areas. However, in most states, charter schools are able to choose their location. The proportions of charter students by location are displayed in Figure 4 above. Slightly over half the students in the data attended charter schools located in urban areas and about one-quarter of the charter students were from the suburbs. About 16 percent of the charter students attended rural charter schools, while fewer than five percent were from charters in towns. Therefore, the charter impacts will be dominated by the urban and suburban charter experience more so than the performance of charter schools in towns and rural areas.

One of the ongoing debates about charter schools is how best to expand the number of high-quality schools: do we see better results coming from new operators entering the market or from charter management organizations (CMOs) who operate multiple schools? The debate concerns hard-won experience in operating charter schools more than economies of scale. Still, recent research suggests that CMOs have a similar range of quality to that seen in the sector overall: some are high-performing, some are not.[16] Armed with another year of student performance data, we are able to update the profile of CMO schools. Through the end of the 2010-11 school year, 26 percent of students attended charter schools affiliated with CMOs. The remaining 74 percent attended independent charter schools.

[16] Woodworth, J. L. and M. E. Raymond (2013). Charter School Growth and Replication, Vol II, Center for Research on Education Outcomes. Center for Research on Education Outcomes, Stanford University, Stanford, CA. Avaliable from: http://credo.stanford.edu/pdfs/CGAR%20Growth%20Volume%20II.pdf.

Just as the charter student demographic profiles differ by state, the average starting score for charter students varies greatly across the states in the study. This is explained in part by the enabling legislation, which may directly target specific student groups or limit the operation of charter schools to particular communities. Where student demographics vary, so does the presenting profile of academic readiness, as reflected in state achievement test scores. Across the 27 states, the average charter student starting test score is negative for both reading and math, as shown in Table 8 below.[17] Some states have much lower starting scores in both subjects, with the lowest being in Missouri, which only allows charter schools to locate in urban areas that have a failing traditional school district. Other states have higher than average starting scores; North Carolina has the highest mean in both reading and math.

These vast differences in starting scores across the states are the reason academic growth rather than achievement is the preferred approach for measuring charter impacts. As described in the previous chapter, our method matches students on their starting scores within each state and tracks their subsequent academic growth. This allows for comparisons of state charter impacts to be made.

Table 8: Mean Charter Student Starting Score by State

State	Reading	Math
27-State Average	**-0.05**	**-0.10**
Arizona	0.11	0.01
Arkansas	-0.05	-0.09
California	0.01	0.03
Colorado	0.10	0.02
District of Columbia	0.11	0.09
Florida	0.04	0.04
Georgia	0.17	0.11
Illinois	-0.32	-0.41
Indiana	-0.37	-0.44
Louisiana	-0.26	-0.32
Massachusetts	0.06	0.00
Michigan	-0.30	-0.40

[17] The test scores in Table 8 are represented in standard deviations from the statewide average academic performance of all tested students. A score of zero represents the 50th percentile of performance in the state. Negative scores are below the 50th percentile and positive scores are above the 50th percentile.

State	Reading	Math
Minnesota	-0.22	-0.21
Missouri	-0.60	-0.71
Nevada	0.07	-0.09
New Jersey	-0.41	-0.43
New Mexico	0.11	0.02
New York	-0.41	-0.47
New York City	-0.01	-0.04
North Carolina	0.23	0.13
Ohio	-0.43	-0.52
Oregon	0.17	0.00
Pennsylvania	-0.36	-0.43
Rhode Island	-0.15	-0.14
Tennessee	-0.41	-0.42
Texas	-0.08	-0.23
Utah	0.15	0.10

Demographic Changes in the 16 states

The charter school market is dynamic; in nearly every state, there are new schools opening and others closing each year. These school shifts may drive changes in the charter student population over time. Student demographics may also be affected by other factors, such as program modifications, student recruitment activities, or school relocations made necessary by facilities challenges. The changes in charter student demographics for the 16 states are explored in this section. For each topic, the numbers from the 2009 CREDO study are reported along with three charter school groupings for 2013: continuing schools, new schools, and all schools.[18] Table 9 below shows the matched charter student demographics for the 16 states over time. Profile changes for each of the 16 states can be found in the Supplementary Findings Appendix.

[18] Due to the larger student enrollment in continuing schools as opposed to new schools, the all schools average values will be closer to the continuing schools values. In the 16 states section of the report "all schools" refers to all schools in the 16 states only.

Table 9: Student Demographic Changes in the 16 States from the 2009 CREDO Study to the 2013 Study

Student Group	2009	2013		
	All Schools	Continuing Schools	New Schools	All Schools
Students in Poverty	49%	55%	61%	56%
English Language Learners	7%	7%	9%	7%
Special Education Students	7%	6%	5%	6%
White Students	39%	35%	27%	34%
Black Students	27%	22%	27%	23%
Hispanic Students	30%	37%	42%	38%

The profile of students in the group of states that were studied in the 2009 report has changed since then. As seen in the third and fourth columns of Table 9, both the continuing schools and the new schools have higher proportions of students in poverty and more Hispanic students than the schools in 2009; the differences between the schools in the 2009 report and the new schools in those same states is especially notable.

For all schools in 2013, the student profile in the 16 states differs substantially from the profile reported in 2009. Most notably, charter schools now enroll higher percentages of students in poverty and Hispanic students than in 2009. There are lower proportions of black and white students in charter schools now than in 2009.

Charter school openings and closings are just one contributor to shifting student demographics. Another factor that contributes to data availability – and therefore student profiles – is modified assessment schedules within states. Four of the 16 states added new assessments that allowed for greater inclusion of charter students in high school grades in 2013 compared to 2009. These changes are reflected in Table 10 below, which lists the percentages of charter students in elementary, middle, high and multi-level schools.

As shown in the table below, about one-third of each school group is comprised of students in elementary schools. The highest percentage of elementary students was in 2009. The continuing schools had higher proportions of students in multi-level schools and high schools but a lower proportion of middle school students than the 2009 schools. The students in new schools were arrayed by grade span in proportions similar to those of 2009 schools. For all schools in 2013, there are smaller proportions of students in elementary and middle schools and larger proportions in multi-level and high schools than in 2009.

Table 10: Grade Span Changes in the 16 States

Student Group	2009	2013		
	All Schools	Continuing Schools	New Schools	All Schools
Students in Elementary Schools	36%	33%	34%	33%
Students in Middle Schools	22%	17%	21%	18%
Students in High Schools	16%	19%	19%	19%
Students in Multi-level Schools	26%	31%	26%	30%

Starting scores are another area that could be affected by both grade span and student profile changes over time. Table 11 below displays the average starting scores for the charter students in each group. In reading, the starting scores are higher in the continuing schools in 2013 than in the 2009 schools compared to the average performance in their states. The average starting scores for new schools are lower than the 2009 starting scores; this is also the only school group with a negative average starting score in reading. The starting-score reading average for all schools in 2013 is higher than the 2009 average.

Table 11: Average Starting Score Changes for Charter Students in the 16 States

Subject	2009	2013		
	All Schools	Continuing Schools	New Schools	All Schools
Reading	.01	.04	-.02	.03
Math	-.05	-.02	-.05	-.02

In math, every charter school group has negative average starting scores compared to the rest of their state. The average starting score in math is better for the continuing schools than in 2009, however. The new schools in 2013 have a mean math starting score that is equivalent to the 2009 average. The starting score average for all schools in 2013 is better for math than in 2009.

The final area of comparison for the 16 states is the average growth scores for the VCRs, the twins matched to each group. The VCRs are the same demographically as the charter students, including having the same starting score. The VCR growth scores, which are shown in Table 12 below, form the baseline against which the corresponding charter cohort will be compared. Because the charter students change demographically over time, the matched VCRs also change. Therefore, the performance trends of the comparison groups cannot be expected to remain static. This will affect the findings regarding charter school impacts, because the graphs in this report set the average VCR growth

at zero and express charter performance in relation to it. If the VCR growth differs across time, interpreting the measures of charter school impacts becomes more challenging.

Table 12: Average Growth Score Changes for VCRs in the 16 States

Subject	2009	2013		
	All Schools	Continuing Schools	New Schools	All Schools
Reading	.00	-.02	-.02	-.02
Math	-.01	-.03	-.02	-.03

The table above shows that average reading growth was zero for the VCRs in the 2009 report.[19] The VCRs for the continuing schools have lower reading growth than the 2009 schools. The average reading growth for the new schools' VCRs is also lower than that of the 2009 schools. Unsurprisingly, the VCR average for all schools in 2013 is also lower than in 2009. The VCR average growth in math follows the pattern found in reading.

In other words, in both reading and math, the charter school impacts for the 16 states in 2013 will be measured relative to a lower baseline of VCR growth than was the case in the 2009 report. The implications of this will be discussed in the following chapter.

[19] Zero growth means that the VCRs had learning gains in reading that were, on average, equivalent to the statewide average learning gains in reading.

4. Original 16-State Update

The policy landscape for education reform in general and for charter schools specifically has changed since our first charter school report in 2009. Nearly all of the first two decades of the charter movement were focused on growth – passing charter laws in new states and increasing the number of schools in existing states. That focus began to shift at the end of the second decade as widespread school quality signals became available for the first time – helped in no small part by the implementation of *No Child Left Behind*. This new information turned policymakers' focus away from growing the numbers of charter schools to increasing educational quality in the charter sector. We have the chance to examine whether the recent shift in focus led to better outcomes for charter students. To help answer that question, this section looks at the evolution of charter student performance in the same 16 states as the original report.

The results reported in 2009 serve as the anchor for the trend analysis. The main comparison is the growth of all charter schools in the 16 states in the available periods since the original report, ending with the 2010-2011 school year.[20] These results are labeled as 2013 results. There are two distinct charter school groups within the 2013 results: continuing schools and new schools. Continuing schools were included in the 2009 report, while new schools are the newly opened or newly tested schools in the 16 states that were not included in the 2009 report. Since the landscape in the original 16 states continues to change, the continuing schools and new schools results may differ. Furthermore, comparing the performance of the new charter schools to that of the 2009 results may provide insight into differences in early student outcomes across time. Because the new schools are young and relatively few in number, there are many more student records for the continuing schools than there are for the new schools. This means that the 2013 results will be heavily influenced by the continuing schools' results.

Click here for an infographic the school groups for the 16-state update.

The aim of these comparisons is twofold: to determine whether and how charter performance has changed since 2008 (the last year of data in the 2009 report) and, if performance has changed, to identify whether the change arises from improvement of the original stock of schools or from the performance of new schools. In addition to the overall results, we looked at the charter performance changes for the same student subgroups that were covered in the 2009 report. We also report on the overall charter impact changes for each of the original states between the 2009 report and the current

[20] For a list of the growth periods included in the original and current time periods by state, please see the Supplementary Findings Appendix.

time period.[21] To interpret the changes in charter student performance across time periods, we focus on the cohort of schools that appeared in the 2009 study. We need to consider three possible shifts: a shift in the number of schools that operate, a shift in the performance of the charter schools over time and a shift in the performance of the TPS comparison baseline over time. There were 193 schools that were included in the 2009 report that subsequently closed; closer inspection of the group of closing schools reveals that they had lower growth in both reading and math throughout the years covered by the earlier study. To be precise, schools that closed since the 2009 report posted an average of 72 fewer days of learning in reading and 80 fewer days of learning in math before closure. Even if no other changes occurred in these communities, we would expect an upward shift in average charter school performance relative to TPS.

The second possible shift regards changes in the performance of continuing schools. Their performance may improve as they gain institutional knowledge and experience over time. Conversely, this group's performance may decline if they are not able to build sustainable school models or maintain a mission-driven focus over the long term.

The third potential shift that must be considered is that the performance of the TPS comparison groups may change. District schools could improve upon their own earlier performance or post average yearly gains that are worse than before. To tell the full "then-now" story for the 16 states in the 2009 report, both TPS and charter trends need to be tracked.

Overall Charter School Impact Changes

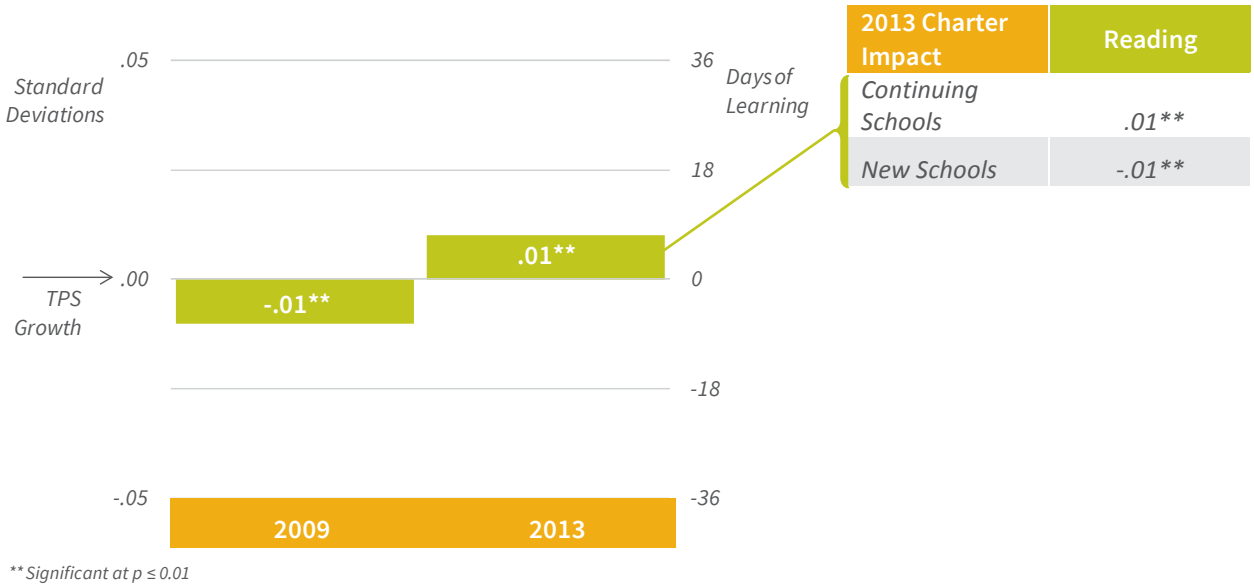
It has been four years since the 2009 report, so the fate of the charter sector in the 16 states is of interest. In its purest construction, the trend would only examine the continuing charter schools from the 2009 study and their current performance. That is one of the relevant comparisons in Figures 5 and 6 below. The performance of new schools is also important, because it sheds light on whether there has been systemic advancement in the creation of strong schools. However, to anchor this chapter back into the larger impact analysis of this report, we present the 2013 results to describe the current charter landscape in our original states. We first examine whether overall charter performance has changed since the 2009 report for the 16 states.

The 2009 and 2013 results for reading are shown in Figure 5 below; math is shown in Figure 6. The table to the right separates the 2013 results for continuing and new charter schools. The baseline of

[21] Subsequent to the release of the 2009 report, data issues in two states were discovered. In the District of Columbia, 272 observations with test score outliers were inadvertently kept in the original report, although outliers were dropped for all other states. In North Carolina, 9,449 student records were incorrectly reported to us as charter records in the 2006-2007 school year dataset. The analyses from the first report were re-run without the erroneous records from these two states. The only results affected are the state charter impacts for these two states. The corrected charter impacts are displayed in this report.

comparison for each year is the corresponding VCR average growth score. In Figures 5 and 6, the VCR average is set to zero; this allows the relative learning gains for each year to be compared.

Figure 5: Overall Charter Impact Changes for 16 States in Reading

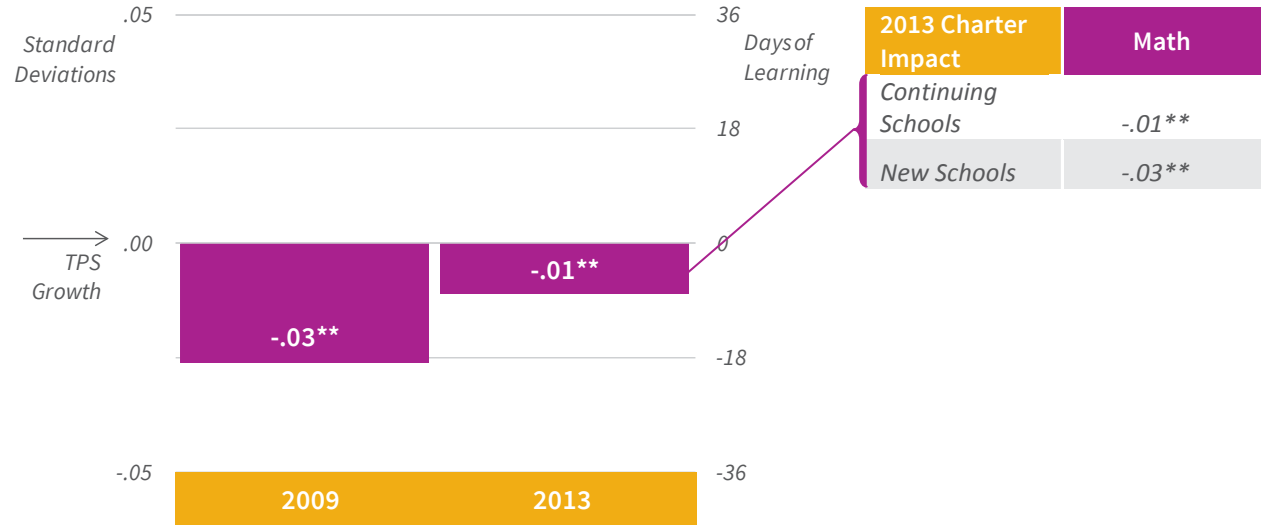


** Significant at p ≤ 0.01

In reading, the 2009 charter school impact on learning gains was significantly lower than their TPS comparison by about seven days of learning per year. In 2013, the charter impact on student learning in reading is positive and significant. It amounts to about seven days of additional learning for charter students compared to the average TPS student. Looking at just the continuing schools in 2013, students at these same charter schools had about seven more days of learning than their TPS counterparts in reading. Results for charter students in new schools mirror the 2009 findings: students at new schools have significantly lower learning gains in reading than their TPS peers.

The 2009 and 2013 charter school impacts on math learning gains are significantly lower than their respective TPS counterparts, as shown in Figure 6. The difference for charter students in 2009 was 22 fewer days of learning, while in 2013 the deficit has shrunk to about seven fewer days of learning, indicating a relative improvement over time. For continuing schools, charter school students learn significantly less in math than their TPS peers. The new charter school results in math follow the pattern seen for reading – the performance of the new charter schools mirrors the 2009 results.

Figure 6: Overall Charter Impact for 16 States in Math



** Significant at p ≤ 0.01

Without considering the differences in TPS growth for the cohorts, the charter results alone might lead one to conclude that the students at these charter schools had similar or better results in 2013 than in 2009. However, as previously shown, TPS growth has changed over time. Figures 7 and 8 below show the same charter impacts that are displayed in Figures 5 and 6 above, respectively, but the baseline for each impact is now based on the actual growth for their TPS comparison group. These baselines are shown with orange boxes. When the relative charter impact is negative, the bar is below the TPS marker; when the relative charter impact is positive, the bar is above the TPS marker.

Figure 7 shows that reading growth in the TPS sector, as measured by the VCRs, is lower in 2013 than it was in 2009. In 2009, charter schools had a small negative impact relative to neutral VCR growth. Charter students in 2013 have a small positive impact in reading relative to negative VCR growth. Therefore, their absolute performance seems to be on par with the findings for charters in 2009.

Figure 7: Overall Charter Impact Changes Based on Comparison TPS Average Growth in Reading

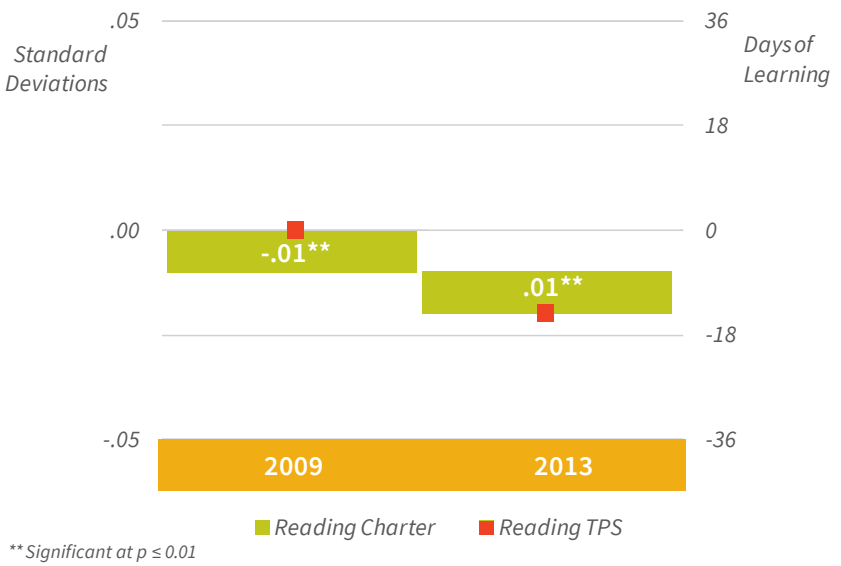
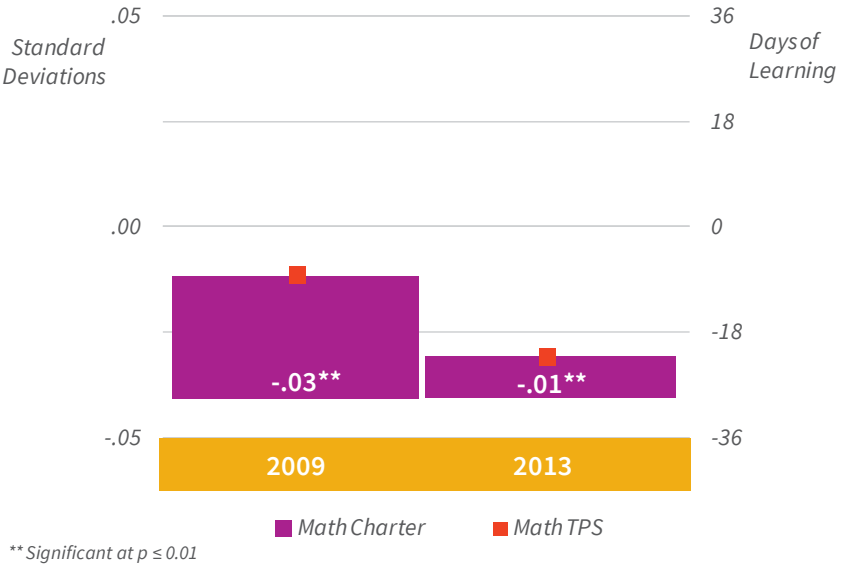


Figure 8: Overall Charter Impact Changes Based on Comparison TPS Average Growth in Math



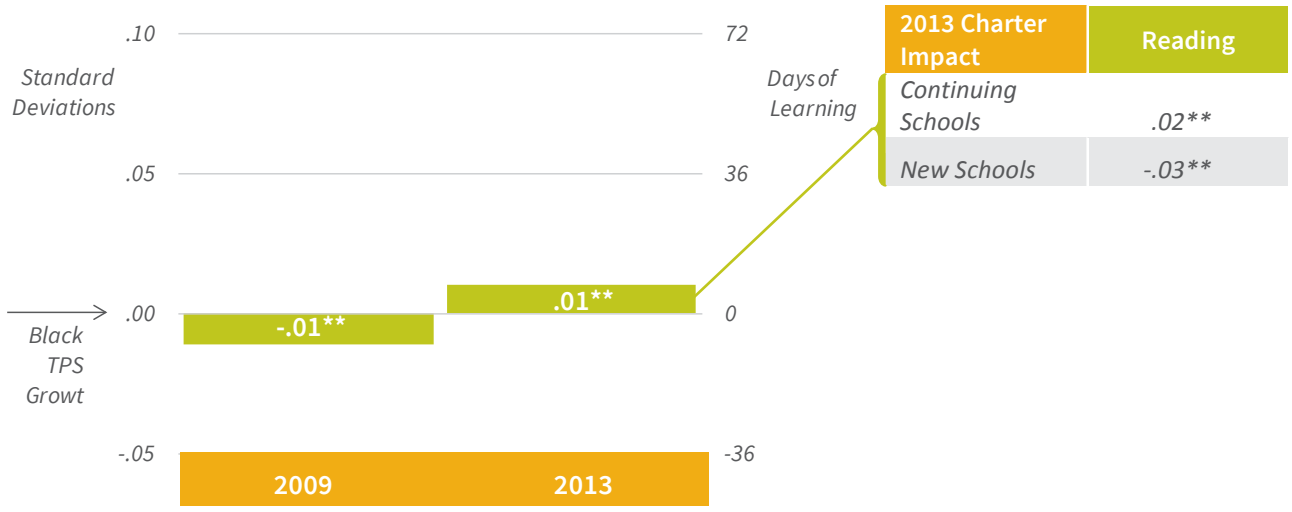
For math, charter schools impacts on learning gains are negative in 2009 and 2013, but the relative learning gap for 2013 is smaller than in 2009. However, Figure 8 shows that the smaller learning gap in math exists because the TPS growth is lower in 2013 than it was in 2009. When this is considered, charter performance in math looks stable over time in the 16 states.

In both subjects, the absolute performance of charter schools remained stable while the TPS standard of comparison was lower in 2013 than in 2009. The new charter schools in the original 16 states, however, are weaker than the 2009 schools in absolute terms.

Charter School Impact Changes with Black Students

Persistent achievement gaps along racial/ethnic lines continue to plague the American public education system. Because of this, many charters are authorized explicitly to serve historically underserved student populations, such as black students, with the expectation that the charters will improve their educational outcomes. Looking at learning gains for black charter students relative to the learning gains of black students attending TPS, as shown in Figures 9 and 10, is one way to gauge progress toward this goal.

Figure 9: Charter Impact Changes with Black Students in Reading

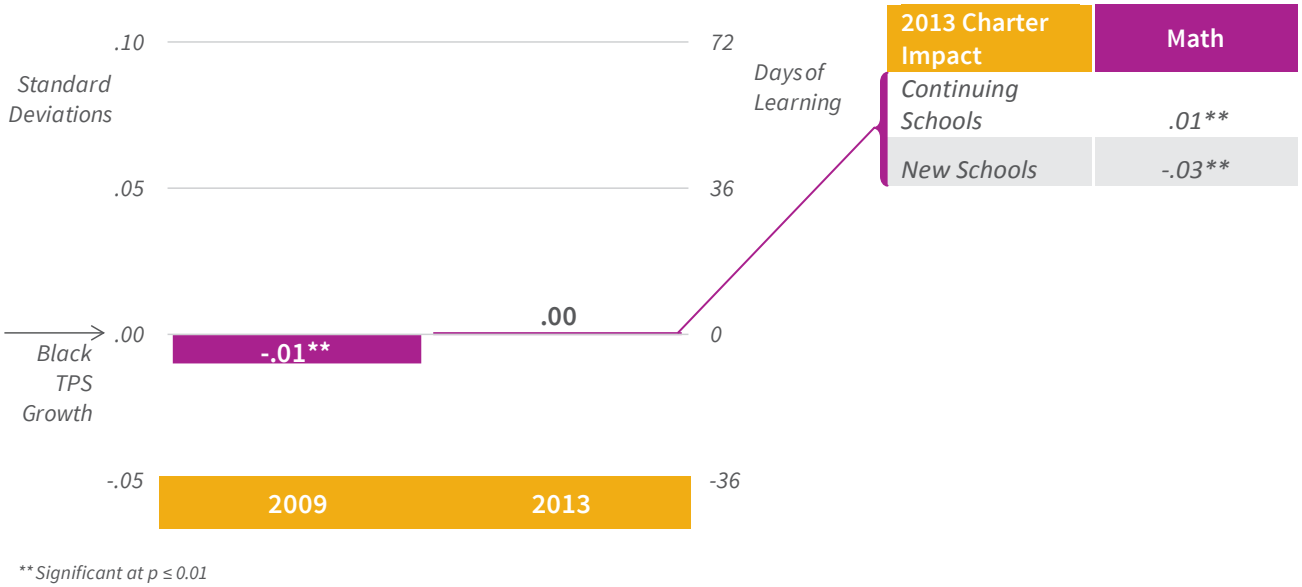


** Significant at $p \leq 0.01$

The academic gains of black students in charter schools lagged behind that of black students at TPS in 2009 in reading by about seven days of learning. In 2013, the situation is reversed; black students in charter schools have seven additional days of learning in reading compared to their counterparts at TPS. Separating the 2013 results by continuing schools and new schools reveals a difference between the two school groups. At continuing charter schools, black students have 14 more days of learning in

reading compared to black students in TPS. In the new school group, though, black charter students learn significantly less than their TPS peers – receiving 22 fewer days of learning at new charters.

Figure 10: Charter Impact Changes with Black Students in Math



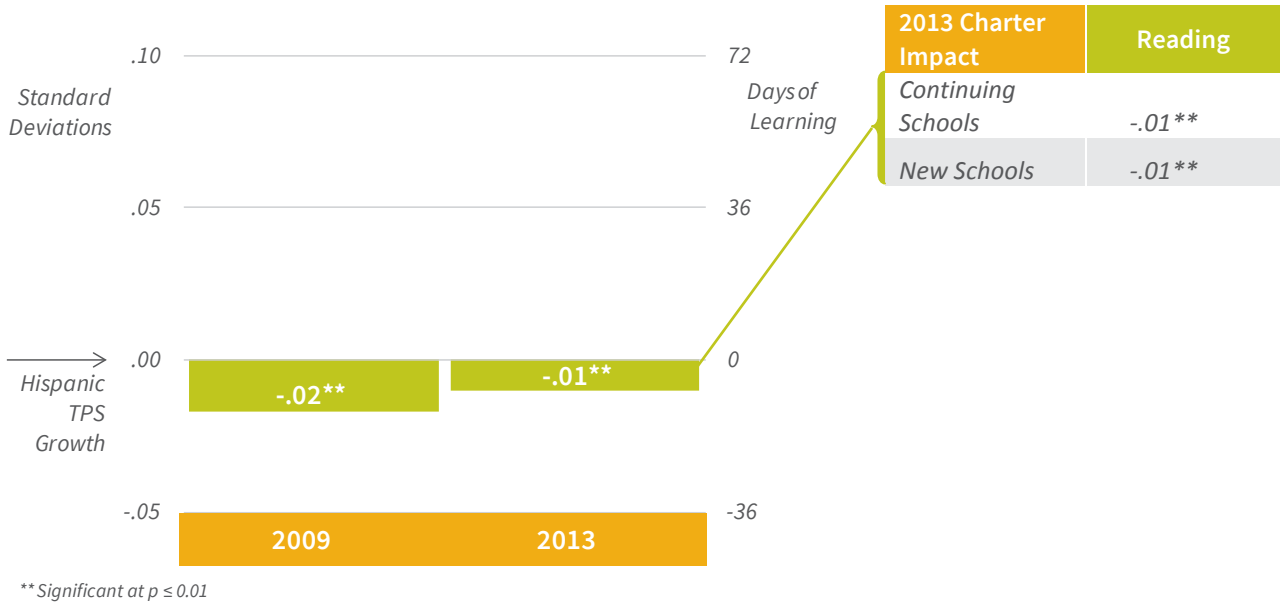
** Significant at $p \leq 0.01$

The pattern for math closely parallels that for reading. When the learning gains of charter and TPS black students are compared in math, those who attended TPS had an advantage of seven days of learning compared to those who attended charters in 2009. In 2013, the learning gap has disappeared; black students have similar learning gains whether they attend a charter or TPS. However, the results for 2013 schools differ for continuing and new schools. Black students who attend continuing charter schools have better learning gains than black TPS students by about seven additional days of learning. Black students at new charters do not fare as well; these students have 22 fewer days of learning in math than their peers at TPS.

Charter School Impact Changes with Hispanic Students

According to the most recent US Census, people of Hispanic origin comprise the fastest-growing ethnic group in the United States.[22] This growth is reflected in the demographics of the charter schools in the 16 states, as over one-third of the current student population is Hispanic. Academic outcomes for Hispanic students become increasingly important in light of these trends. The charter school impacts for Hispanic students are shown in Figures 11 and 12. The baseline of comparison is the average learning gain of Hispanic students at TPS in the same year.

Figure 11: Charter Impact Changes with Hispanic Students in Reading

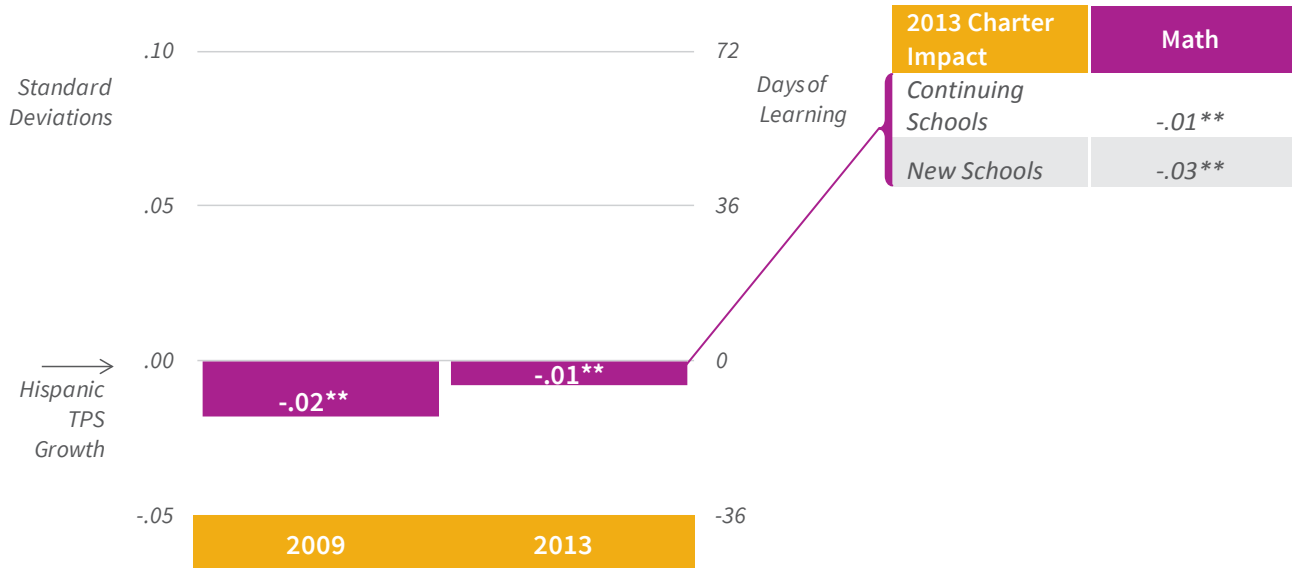


** Significant at $p \leq 0.01$

Hispanic students at charter schools had lower growth in reading than Hispanic students at TPS in 2009. At that time, Hispanic charter students lagged their TPS peers by about 14 days of learning. The deficit has shrunk in 2013 to about seven fewer days of learning. Both continuing and new schools in 2013 have similar reading results for Hispanic students.

[22] Ennis, S. R., Rios-Vargas, M., & Albert, N. G (2012). "The Hispanic Population: 2010". C2010BR-04. U.S. Census Bureau. Retrieved 12 March, 2012, from: http://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf

Figure 12: Charter Impact Changes with Hispanic Students in Math



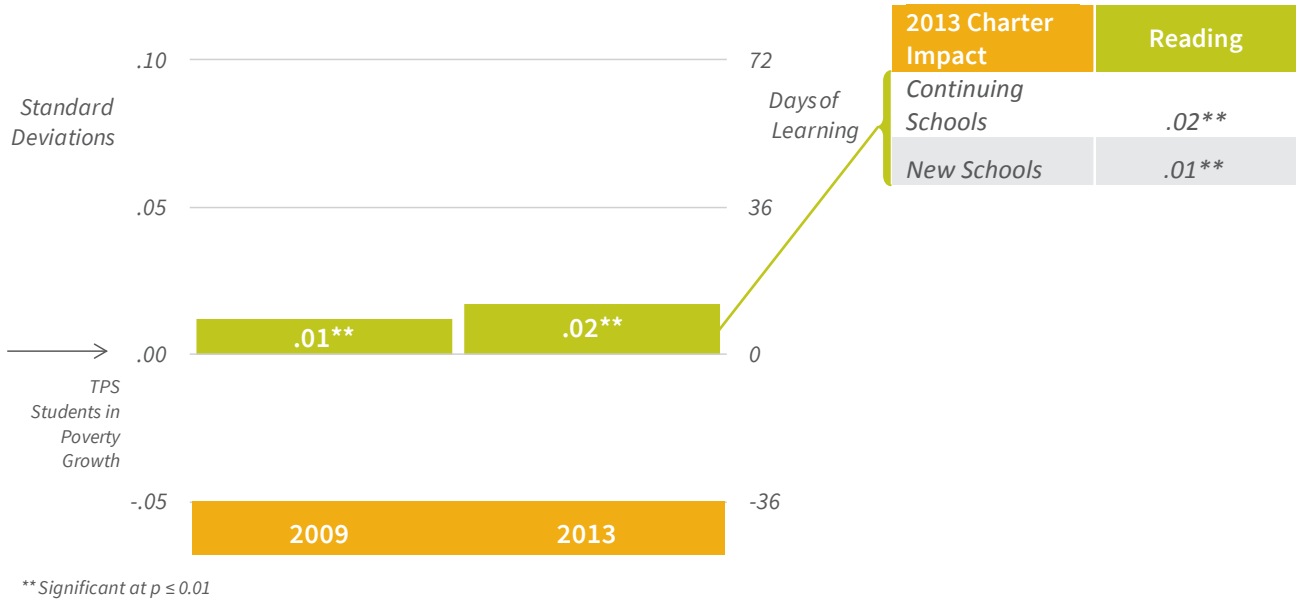
** Significant at $p \leq 0.01$

The 2009 and 2013 results for Hispanic students in math mirror the reading results. The math learning gap for Hispanic charter students compared to Hispanic TPS students was 14 days of learning in 2009. This gap is reduced in 2013 to seven fewer days of learning for Hispanic charter students compared to their counterparts in TPS. The math result for Hispanic students at continuing schools also amounts to seven fewer days of learning than Hispanic students at TPS. Hispanic students in new charter schools in 2013, however, have 22 fewer days of learning than their TPS peers.

Charter School Impact Changes with Students in Poverty

The academic performance of students in poverty is a national concern, as their achievement continues to lag that of students who are not in poverty.[23] As we saw in Table 9 in the Charter School Demographics chapter, the proportion of students in poverty is growing in charter schools in the 16 states; poverty now affects the majority of charter students in these states. Thus, contemporary performance with this student group escalates in importance for overall charter school quality. In Figures 13 and 14 below, the charter impacts with students in poverty are shown relative to the baseline of TPS students in poverty.

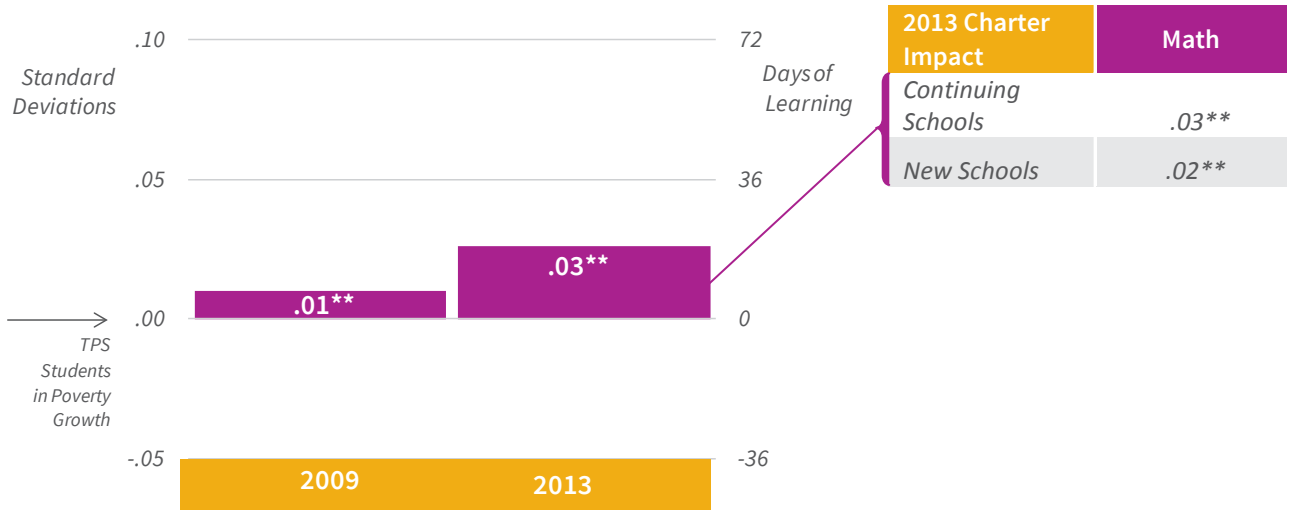
Figure 13: Charter Impact Changes with Students in Poverty in Reading



In 2009, charter students in poverty had about seven days of additional learning in reading compared to TPS students in poverty. Charter students in poverty in 2013 continue to have an advantage over their TPS counterparts. The difference in 2013 is 14 additional days of learning. Both continuing and new schools have statistically significant and positive reading impacts for charter students in poverty.

[23] National Center for Education Statistics (2012). "Findings in Brief: Reading and Mathematics 2011: National Assessment of Educational Progress at Grades 4 and 8" (pp.10). U.S. Department of Education, Institute of Education Sciences, Alexandria, VA. Retrieved 16 December, 2012, from: http://nces.ed.gov/nationsreportcard/pdf/main2011/2012459.pdf

Figure 14: Charter Impact Changes with Students in Poverty in Math

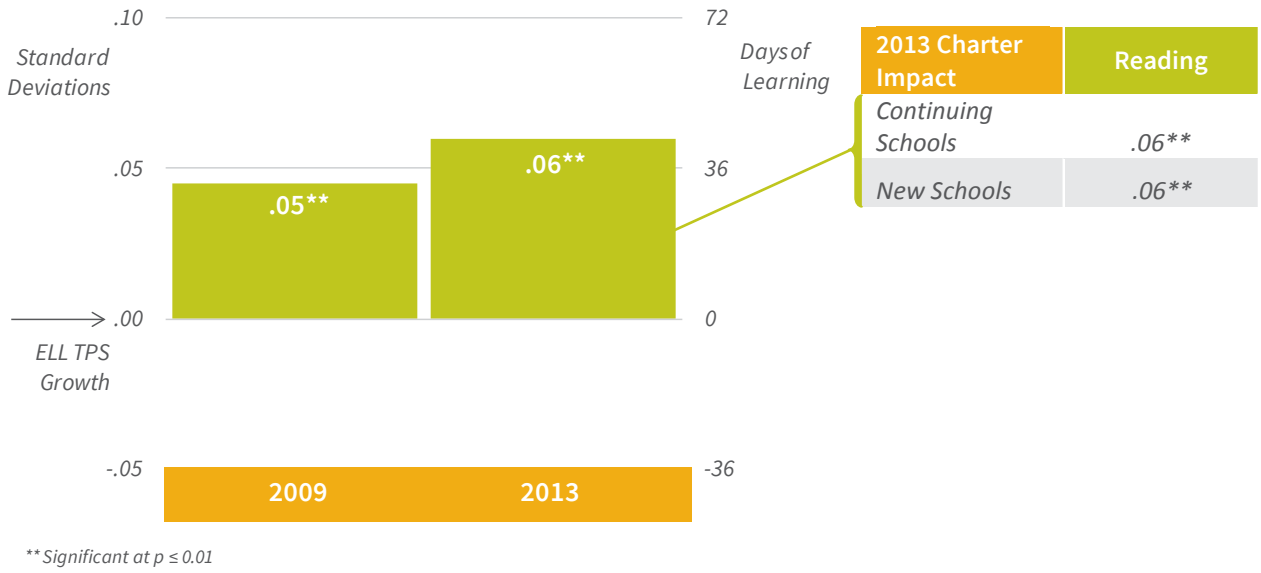


Compared to the learning gains of TPS students in poverty, charter students in poverty learn significantly more in math, as seen in Figure 14. Moreover, this difference in performance has widened. In 2009, charter students in poverty had about seven additional days of learning in math than their TPS peers, while in 2013 the advantage is 22 additional days of learning for charter students in poverty. Mirroring the reading findings, both continuing and new schools in 2013 have positive math impacts for charter students in poverty.

Charter School Impact Changes with English Language Learners

English language learners (ELLs) continue to be a much-discussed student group in education. There have long been charter schools with missions specifically targeted to non-native English speakers. New charter schools have a larger proportion of ELL students than schools in the 2009 report, suggesting that this is an increasing phenomenon. The learning gains shown in Figures 15 and 16 for ELL students at charter schools are measured relative to ELL students at TPS.

Figure 15: Charter Impact Changes with English Language Learners in Reading

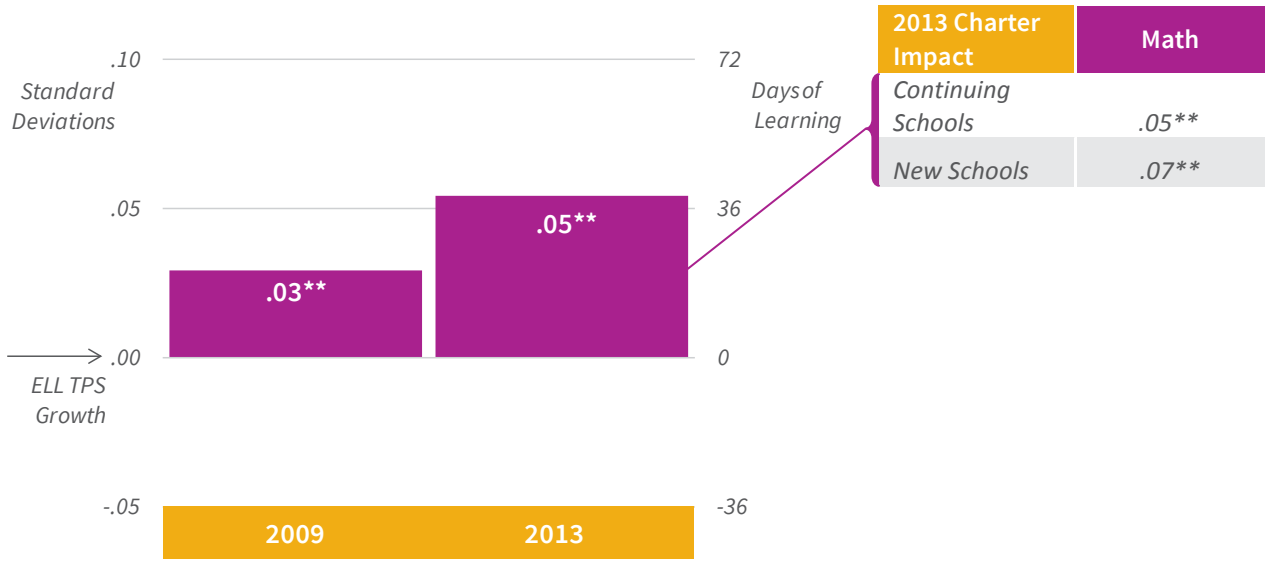


** Significant at p ≤ 0.01

In 2009, ELLs in charter schools had better learning gains in reading than ELL students at TPS. The advantage was equivalent to about 36 additional days of learning. This advantage is larger in 2013 at 43 additional days of learning for charter students, regardless of whether they attend continuing or new charter schools.

In math, ELL charter students in the 2009 report had about 22 additional days of learning compared to their ELL counterparts at TPS. ELL students receive a significant benefit in math from charter attendance in 2013 as well – about 36 additional days of learning. ELL charter students in 2013 have larger math learning gains at new schools than at continuing schools.

Figure 16: Charter Impact Changes with English Language Learners in Math



** Significant at p ≤ 0.01

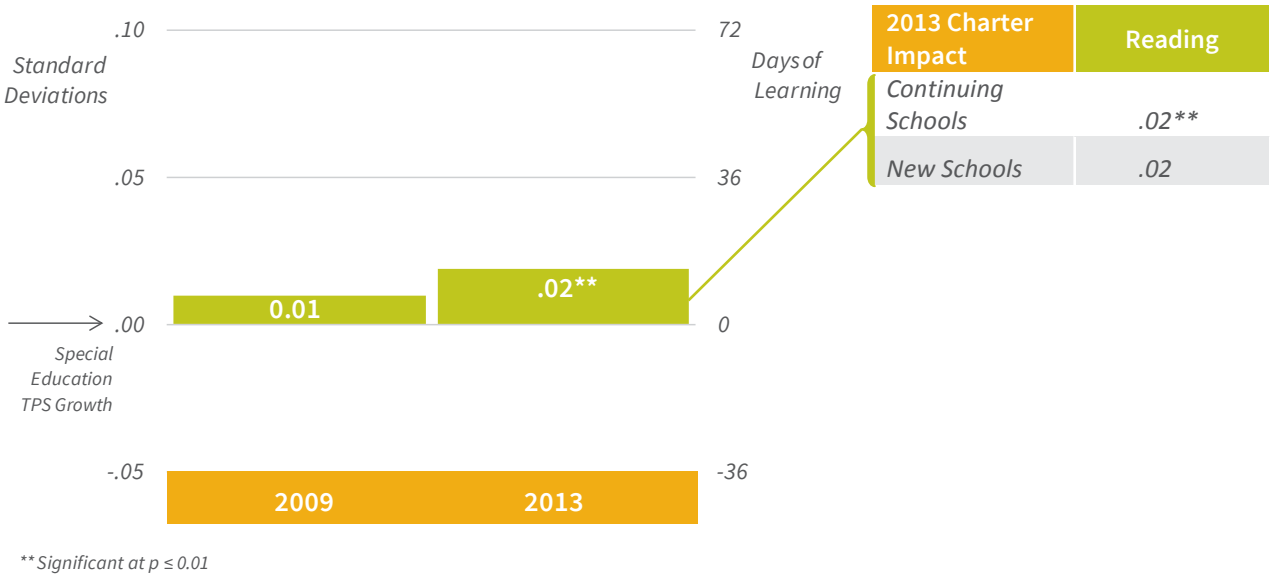
Charter School Impact Changes with Special Education Students

The demographic comparisons in the 2009 report indicated that charter schools serve a smaller proportion of special education students than the traditional public school sector. As we have reported in recent state studies, in some cases this is a deliberate and coordinated strategy with local districts that is based on a shared goal of meeting students' needs in the best way possible. In addition to strategic collaboration, anecdotal evidence suggests that the two sectors may differ in their criteria for referring students for formal special education services. CREDO is pursuing further research in this area. Regardless of the proportion of special education students being served, the question remains whether charter schools are strengthening their ability to meet the diverse needs of this student group.

As discussed in the 2009 report, comparing student growth for special education students is difficult. In many cases, there are small numbers of students with special education needs who also take the regular state test instead of an alternate assessment. Because we must use the regular state test results, students with different special education designations are pooled together to enable reliable computations of learning impacts. But the aggregation itself means that there is large variation in underlying conditions. It is no surprise, then, that the results are highly sensitive to changes in just a few students and produce estimates of average learning that have wide distributions around them. With this cautionary note, the results are presented in Figures 17 and 18 below. The baseline of

comparison is the average learning gain of the TPS students who received special education services during the same time period.

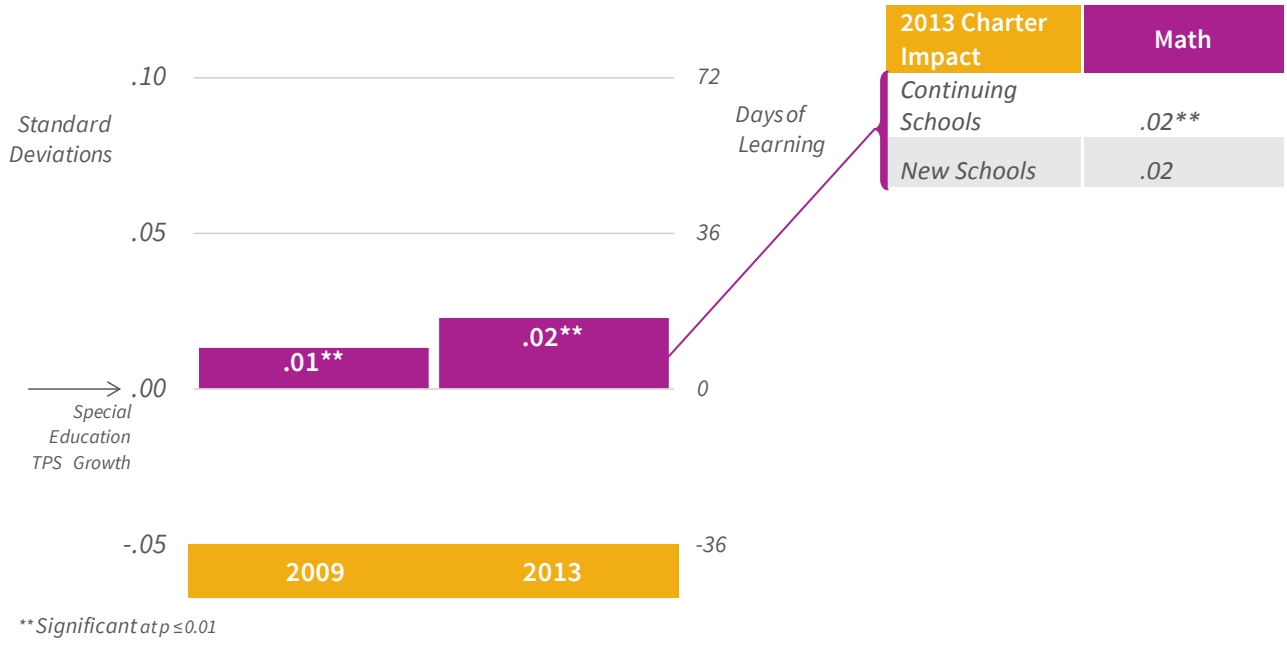
Figure 17: Charter Impact Changes with Special Education Students in Reading



** Significant at p ≤ 0.01

In reading, special education students at charter schools had similar learning gains as special education students at TPS in the 2009 report. In 2013, special education students at charter schools have 14 additional days of learning than their counterparts at TPS. Looking at the two school groups for 2013, however, reveals that this result is statistically significant only for continuing schools. At new schools, special education students have similar learning gains in reading compared to TPS special education students.

Figure 18: Charter Impact Changes with Special Education Students in Math



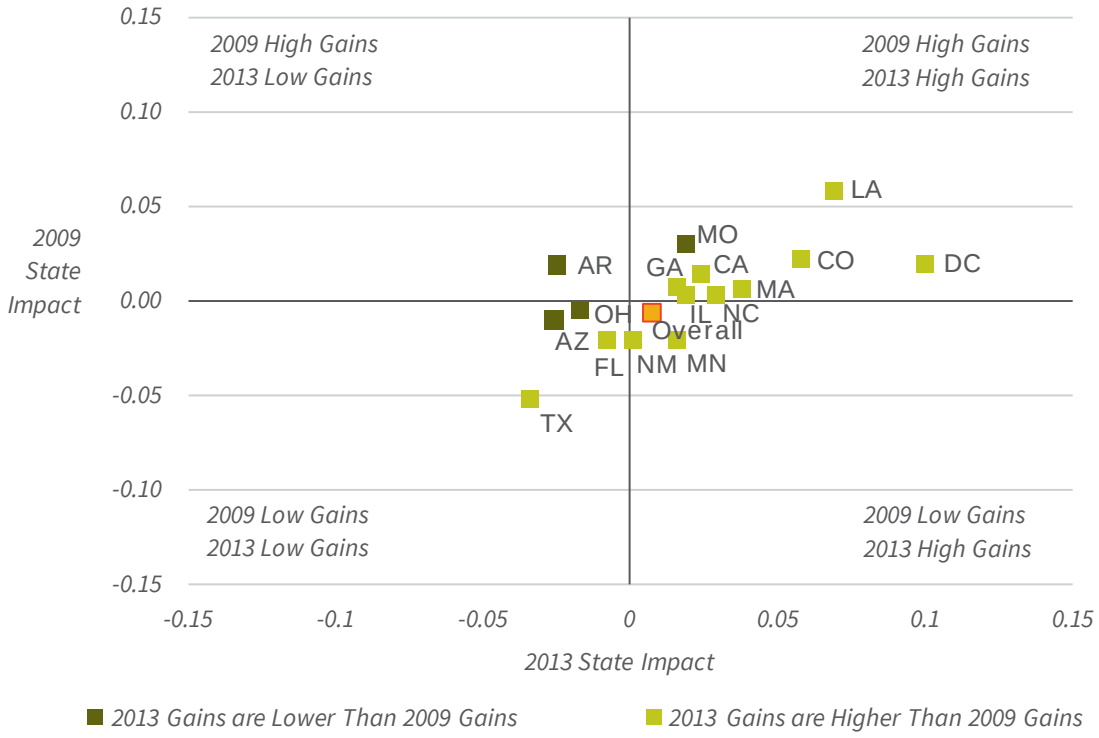
Academic progress for special education students at charter schools in 2009 was significantly better in math than for similar students at TPS by about seven more days of learning. This continued to be true for charter schools in 2013 with special education students receiving 14 more days of learning at charter schools than at TPS. When the 2013 results are separated, it is revealed that the 2013 results are heavily influenced by the continuing schools. Special education students learn significantly more in math than their TPS counterparts in the continuing charter schools but not at the new charters.

Click for reading and math infographics about state charter impact changes in the 16 states.

State Charter School Impact Changes

In the 2009 report, disaggregating the pooled charter school impacts by state revealed substantial variation in both reading and math. Have the high-performing states in 2009 remained high-performing in 2013? Have underperforming states been able to improve their results? Looking at the changes in charter school performance by state will help determine whether the improvement in the pooled charter school impacts corresponds to improvement in all of the individual states.

Figure 19: Reading Impacts by State in 2009 and 2013



The state impacts for 2013 in reading are juxtaposed against the 2009 state charter impacts in Figure 19 above. The majority of states (12 of the 16) have better charter impacts in 2013 than in 2009. There were four states – Arkansas, Arizona, Ohio, and Missouri – with lower charter impacts in 2013 than were reported in 2009.

Figure 20: Math Impacts by State in 2009 and 2013

The 2013 learning gains in math for all charters are shown by state in Figure 20 compared to the state charter impacts from the 2009 report. Charter learning gains remained stable or improved slightly in all but two states – Arkansas and Georgia. One state of note in this figure is Florida – the only state to improve from negative to positive charter impacts. In the original time period, Florida charters had lower learning gains in math than their TPS counterparts, but in the current period, charter impacts are positive relative to TPS.

These findings show that the charter school sector has improved in most states since the 2009 report. The states with the most dramatic positive shifts from 2009 to 2013 were those that had strong results for both continuing and new schools.[24] These shifts were most noticeable in reading for Colorado (Denver), the District of Columbia, Massachusetts, and Minnesota. This indicates that a strong commitment to quality – and the ability to deliver it – exists at both the school and authorizer levels in these states.

[24] State-by-state results for continuing and new schools can be found in the Supplementary Findings Appendix.

Summary of Charter School Impact Changes

The findings presented in this chapter update the performance of charter schools in the 16 states covered in the 2009 CREDO report. When compared to the 2009 results, the 2013 findings indicate overall improvement in learning gains for students at charter schools relative to their traditional public school peers in both reading and math. These positive findings are driven largely by performance changes in the continuing charter schools, i.e., those that were included in both the 2009 and 2013 studies. About eight percent of those schools closed during the current time period, and an analysis of their impacts indicates that these were severely underperforming schools in both subjects. These closures helped lift the results in the current analysis. Another factor contributing to the positive findings is not attributable to the charters themselves but rather to their baseline of comparison, the traditional public schools. VCR growth is lower in 2013 than it was in 2009, thereby providing a lower standard against which the charter schools are measured in 2013.

Disaggregating the results by student subgroup revealed that the overall improvement in learning gains from 2009 to 2013 was consistent for nearly all student populations. Charter school impacts with students in poverty and English language learners were positive in 2009 in both reading and math. These positive results have sustained and in fact increased in 2013.

Two additional student groups saw improved learning gains at charters between 2009 and 2013: special education students and black students. Both student groups had weaker growth at charters than TPS in 2009, but outperformed their TPS counterparts in reading learning gains in 2013. Special education students at charter schools maintained a slight advantage in math learning gains from 2009 to 2013. Black charter students, meanwhile, had lower learning gains than their TPS counterparts in 2009 but similar learning gains to TPS by 2013.

Learning gains for Hispanic students were slightly improved in 2013 for both reading and math. However, learning gains for Hispanic students are still lower at charters in the 16 states than at TPS.

The 2013 results across the student subgroups differed for the continuing and new charter schools in the 16 states. Generally, the impacts at continuing charters were better than the impacts at new charters. Further, the new charters' results in 2013 were often lower than the 2009 results for the same student group. This was the case for black and Hispanic students in reading and math as well as for special education students in math. However, English language learners had better learning gains in reading and math at new charters in 2013 than was reported for all charters in 2009.

We also analyzed the changes in charter impact separately for each state. The results showed that most states improved in reading and either held steady or improved slightly in math from 2009 to 2013. As with the overall 16-state findings, these improvements were due to positive changes in performance at the continuing charter schools in most states. New charter school results were weaker than the 2009 results in the majority of states. There was, however, a notable exception to this pattern. In reading,

there were three states with new charter school findings that were much stronger than the 2009 results: the District of Columbia, Massachusetts, and Minnesota.

Although closure of underperforming charter schools was a contributing factor to the overall improvement of the sector, this does not seem to be the case for the state-by-state results. Some states that closed more than 10 percent of existing charters did have relatively large improvements over the two time periods in both subjects.[25] This was the case for Colorado (Denver), the District of Columbia, and Louisiana. However, other states with similar closure rates, such as Arkansas, Georgia and Missouri, had more mixed results. This finding suggests that the criteria used to identify and close underperforming charters may be different across states and that some states' closure policies and practices are more successful than in others. It also suggests that the other side of the charter equation – the schools that are authorized and allowed to open in the first place – is also a factor in charter sector performance.

Taken together, the results from the 16 states suggest that charter schools can improve over time, but that improvements are more likely to be incremental than major. The fate of the new charters that opened since the 2009 report illustrates the continuing need for high quality authorizing.

[25] Please see the Supplementary Findings Appendix for a detailed description.

5. 27-State Analysis

Charter schools are a hot topic. The volume and intensity of attention given to charter schools has increased dramatically across the country. They have become part of the education vocabulary in millions of homes. They receive more coverage in the media than ever before. They are the topic of vigorous debate in many legislatures. And they are the source of deep and often hostile rivalry among educators and policymakers. The vast majority of this activity occurs in a vacuum of evidence about what charter schools are and how well they prepare their students academically.

The purpose of the 27-State Analysis presented in this chapter is to provide an accurate and impartial assessment of the performance of charter schools in those states. The study includes 27 of the 43 states that allow charter schools to operate. These 27 states enroll over 95 percent of all the charter students across the country. The results of this study can therefore be viewed as a sound representation of the national picture of charter school performance.

Moreover, since the analysis is conducted in the same way for all participating states, this report has the additional and important benefit of providing a common yardstick by which the performance of charter schools in different states can be compared to one another. As the performance findings vary from state to state, the opportunity arises to explore in future analyses the reasons why charters in some states do a better job than in others.

This chapter provides the findings of our analysis, starting with the overall impacts when all 27 states are pooled together. We then disaggregate in several ways, in increasingly granular levels, from state-level findings, to school-level findings and finally to the effects of charter school enrollment on different types of students.

Overall Charter School Performance

Research involves choices about the scope of study and the depth of inquiry. One of the decisions the research team faced is the number of years of data to use in calculating the effects of charter school enrollment on student growth. The issue is material to our ability to give an accurate measure of charter school quality because – whatever the eventual choice – charter school impacts are calculated using however many periods are chosen to be included. Each option requires tradeoffs between depth and timeliness.

The breadth of our available data, six years, yields five separate growth periods; recall that it takes two sequential years of student performance data to create one growth period. As presented in Table 13, there are five options. Including all five growth periods in the calculations results in the widest possible scope but could potentially mask changes that occur during that time. Limiting the study to the most recent growth period provides the most contemporary view of charter sector performance but could yield an unstable or atypical snapshot of performance.

The charged political atmosphere surrounding charter school quality only adds to the weight this choice carries with it. We were not oblivious to the risk of incurring charges of being strategic in our choice to the benefit of one group or another. To provide maximum transparency, we provide results for the overall findings in reading and math for all five possible time frames. By providing overall results across a variety of time periods, we provide readers access to the results that most align with their particular interests.

Table 13: Pros and Cons of Using Different Time Frames in Analyses

Pros:	Cons:
5 Growth Periods (Spring 2006 – Spring 2011)	
• Since all available data is used, results have the greatest possible precision • Permits long-term view of performance	• May not be indicative of current state of charter sector • It takes longest time to retire abnormally "bad" or "good" growth periods • Some states missing data in early years
4 Growth Periods (Spring 2007 – Spring 2011)	
• Provides a middle ground between longitudinal view and current view • The 2009 report used 4 growth periods	• It takes years to retire abnormally "bad" or "good" growth periods
3 Growth Periods (Spring 2008 – Spring 2011)	
• Provides a more stable view of charter performance • Reduces time to retire an abnormally “bad” or “good” growth period	• Limits observation of long-term trends
2 Growth Periods (Spring 2009 – Spring 2011)	
• Most recent stable estimates	• Minimal stability • Too short a time period for establishing trends
1 Growth Period (Spring 2010 – Spring 2011)	
• Provides the most up to date measure of charter performance	• No long term analysis possible • Impacts from one growth period may be misleading

All five time frames are presented only for the aggregate results. While the presentation of findings from multiple time frames for every section in this chapter would be comprehensive, it would also become unwieldy. As such, for the remaining analyses we present the findings for the most recent three growth periods (Spring 2008 – Spring 2011). This choice provides readers with recent results while still providing enough information to differentiate between trends in performance and single-period exceptions. To begin building the evidence for current charter school performance, the analysis examined the overall charter impacts on student learning across the 27 states. Figure 21 below shows

the impact of charter school attendance on student growth based on all five growth periods. Every view provides an improved picture of charter school quality when contrasted to results from the 2009 report. Moreover, as recent growth periods become a larger share of the data (i.e., as the older growth periods are retired from the analysis) the estimates of charter school impacts on student academic progress improve.

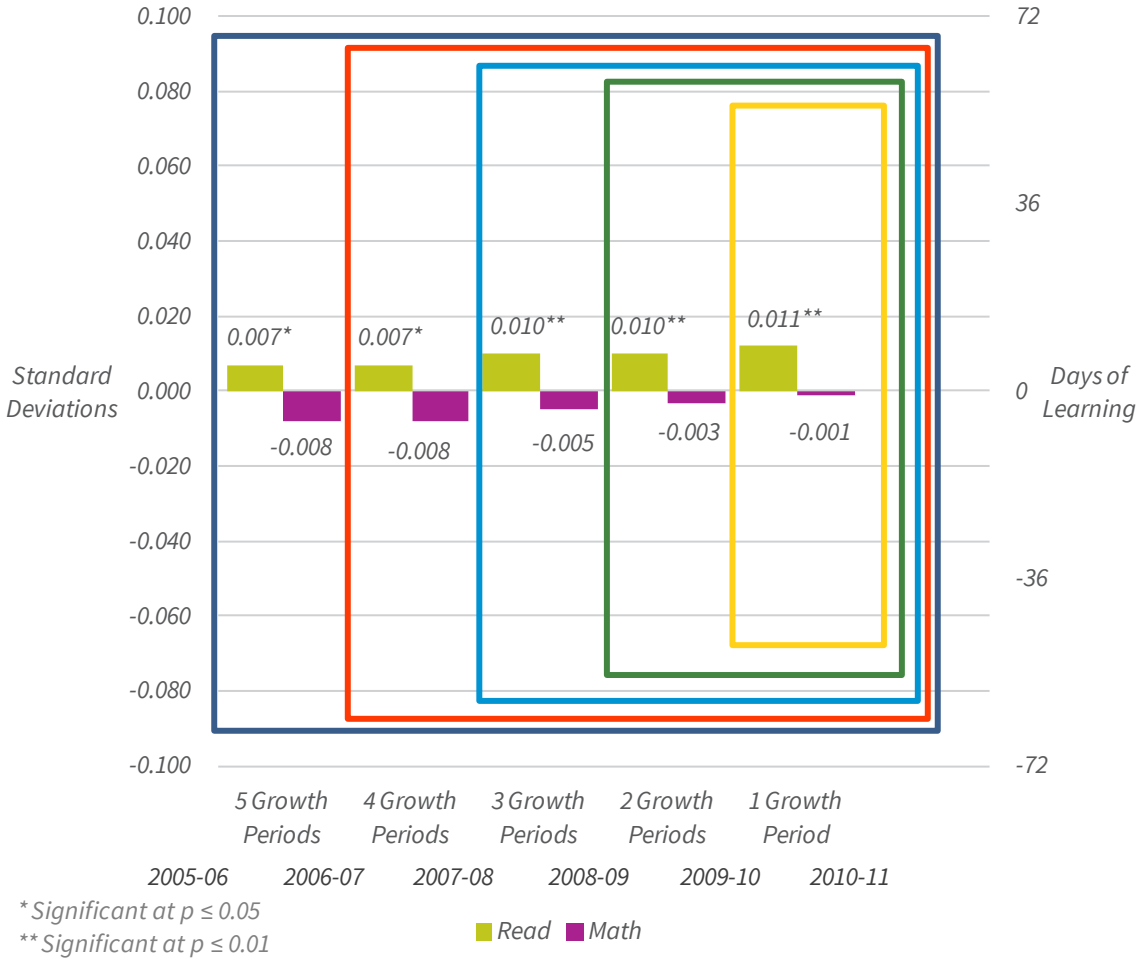
In every scenario, the performance of the virtual twins in TPS serves as the baseline of comparison. The charter school learning gains are expressed relative to that standard. The results are presented with two different measurement scales: standard deviations and days of learning.

Looking at the longest time frame (five growth periods: Spring 2006 – Spring 2011), Figure 21 shows positive charter school impacts on student learning in reading equivalent to five additional days of learning per year compared to what their TPS peers receive. The 5-year charter school impact in math is similar to the learning gains at TPS (equal to no additional days).

It bears mentioning that the 3-period time frame – the middle scenario – reflects the performance of the charter sector since the 2009 study. This result shows the performance of the charter school sector as a whole in the ensuing three years. Across the 27 states, charter performance in the three most recent growth periods is positive and significant in reading, amounting to about seven extra days of learning over that of their TPS peers. The charter school impact on student learning in math is not significantly different between charter students and their TPS peers.

If we limit the analysis to the most recent growth period (Spring 2010 – Spring 2011), students in charter schools have eight more days of learning than TPS in reading. In math, students at charter schools and TPS have similar learning gains.

Figure 21: Overall Charter School Impact by Number of Included Growth Periods



Because 11 states are newly included in this analysis, it is important to investigate whether these new states are responsible for the change in results. To do so, it is necessary to draw from the 16-state analysis presented in the previous chapter. The measure of current performance in the 16-state analysis used the three most recent growth periods – equivalent to the middle option in the set of results in Figure 21 above. Therefore the 3-growth period scenario can be used to discern if the overall 27-state results are heavily influenced by higher growth in the new states.

Recall that for the three most current growth periods, the performance measures for the 16-states were .01 for reading and -.01 for math. Since the 16-state and 27-state reading results are identical, the new states do not change the results from the original set of states. In math, their contribution is more substantial; to raise the 27-state result from lower than TPS for the 16 states to similar to TPS, the new states contribute math impacts that are more positive relative to TPS.

The results in Figure 21 above include all 27 states and tell a story of overall improvement in the charter sector relative to TPS over time. Figure 22 below takes the findings from Figure 20 and presents them as a trend line. As all the time frames ended with the Spring 2011 school year, they share a common endpoint. This means that, moving rightward in Figure 22, each subsequent point excludes the older growth periods. Since the charter impact increases with this rightward movement, this indicates a positive trend in charter school performance over time.[26]

Figure 22: Trend in Overall Charter School Impact

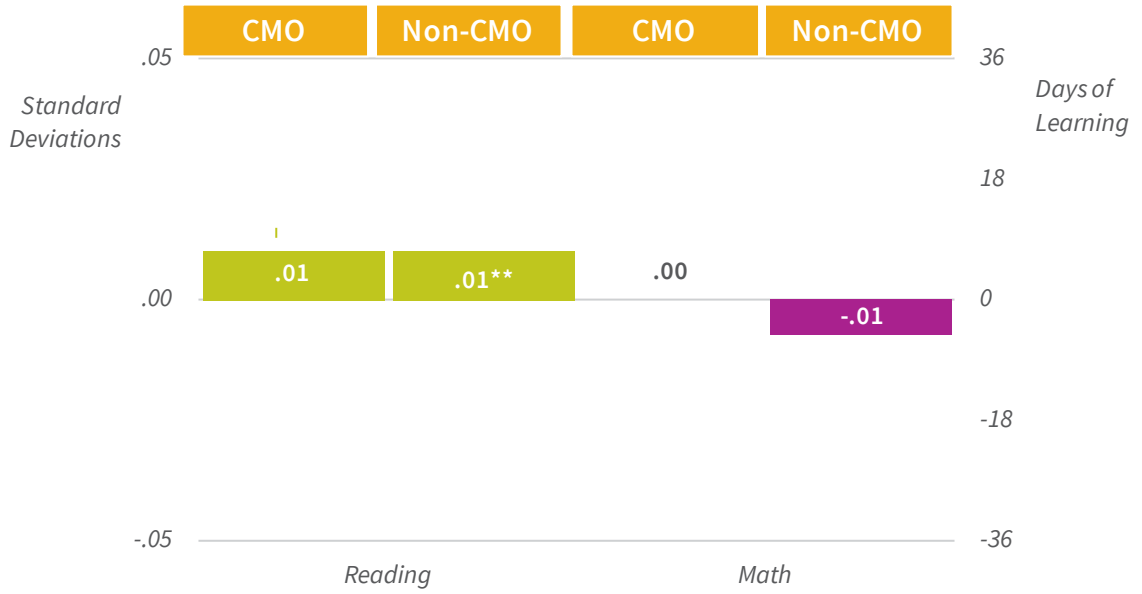
Charter Management Organizations

In the current education reform landscape, charter management organizations (CMOs) are being discussed as a way to drive quality in the charter sector and as a possible solution to turn around failing schools. In addition, many funders and authorizers are evaluating the benefits and costs of charter school networks as a mechanism for developing the charter sector. In a previous CREDO study,

[26] For results by year, see the Supplementary Findings Appendix.

attending a charter school that was part of a CMO was found to have mixed results for students.[27] Those findings used student-level results from Spring 2006 through the Spring 2010 school year – four growth periods. In that study, CMO charter students had reading growth that was weaker than non-CMO charter students, but stronger than TPS students. Results for math were the opposite; CMO impacts were stronger than non-CMO impacts, but both had weaker impacts than those for TPS.[28] Because CMO results are particularly important for many ongoing debates in the charter sector, the same CMO analysis was repeated in this study with an updated time frame covering the three most recent growth periods (Spring 2008 – Spring 2011).

Figure 23: Reading and Math Growth by CMO Status



** Significant at $p \leq 0.01$

The new results, shown in Figure 23 above, find no significant differences between CMO and non-CMO charter schools. The current results represent progress in math. The impact for CMO students in math

[27] Woodworth, J. L. and M. E. Raymond (2013). Charter School Growth and Replication, Vol II, Center for Research on Education Outcomes. University, Stanford, CA. Avaliable from: http://credo.stanford.edu/pdfs/CGAR%20Growth%20Volume%20II.pdf.

[28] CGAR results: Non-CMO reading .007**, CMO reading .005**, Non-CMO math -.012**, CMO math -.005**

is now equivalent to TPS; the earlier finding found that students in CMO charter schools had lower learning gains than their TPS peers. Conversely, the effect in reading is now similar to TPS, which represents a slight decrease in performance from the earlier results.

Charter School Impacts by State

Charter schools look different across the country, and much of the differences relate to the states in which they operate. States adopted charter legislation at different times, differ in the approach taken to charter schools, and have different labor markets. All of these can influence the ability of charter schools to deliver a high-quality education. Not surprisingly, the performance of charter schools was found to vary significantly across states. In reading, charter school students, on average, have better learning gains than TPS students in 16 of the 27 states evaluated. Reading learning gains are weaker for charter students in eight states and similar in three states. In math, 12 states have better learning gains at charter schools than at TPS, while charter schools in 13 states have lower learning gains, and two states have charters with similar learning gains compared to TPS. Table 14 shows the average one-year impact on academic growth of attending a charter school by state.

Click for reading and math infographics about state charter impacts in the 27 states.

Table 14: State Charter School Impacts

State	Reading Charter Impact	Reading Days of Learning	Math Charter Impact	Math Days of Learning
Arizona	-0.03**	-22	-0.04**	-29
Arkansas	-0.03**	-22	-0.03**	-22
California	0.03**	22	-0.01**	-7
Colorado	0.01**	7	-0.01**	-7
District of Columbia	0.10**	72	0.14**	101
Florida	-0.01**	-7	0.00	0
Georgia	0.02**	14	-0.02**	-14
Illinois	0.02**	14	0.03**	22
Indiana	0.05**	36	0.02**	14
Louisiana	0.07**	50	0.09**	65
Massachusetts	0.05**	36	0.09**	65

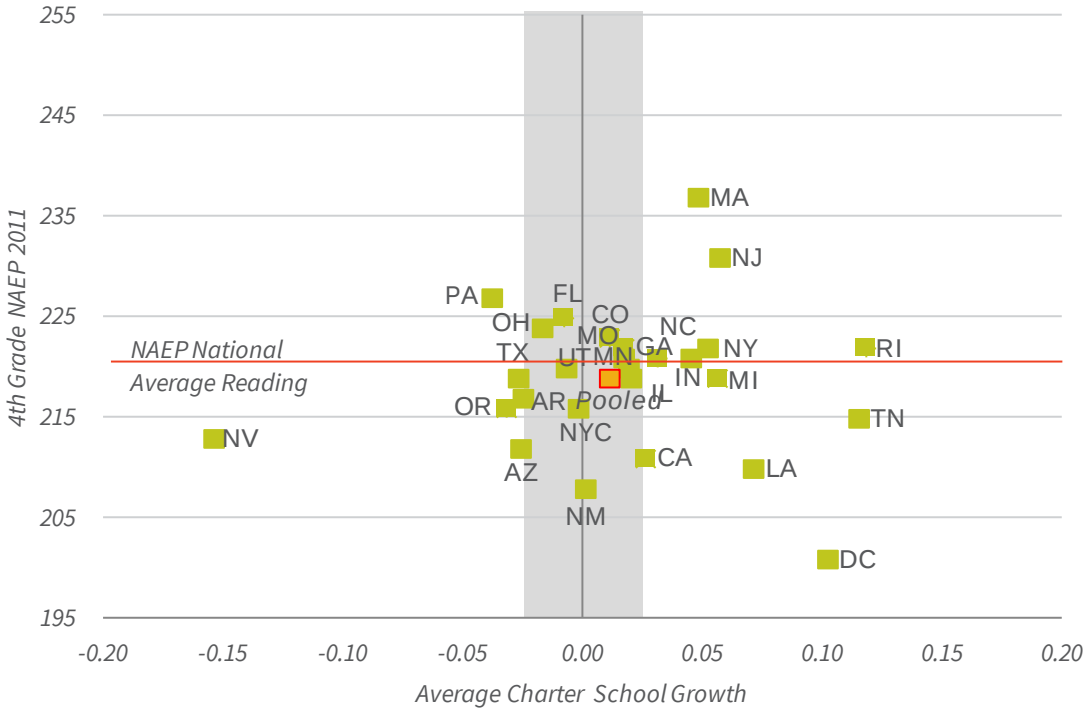
State	Reading Charter Impact	Reading Days of Learning	Math Charter Impact	Math Days of Learning
Michigan	0.06**	43	0.06**	43
Minnesota	0.02**	14	-0.01	-7
Missouri	0.02**	14	0.03**	22
Nevada	-0.15**	-108	-0.19**	-137
New Jersey	0.06**	43	0.08**	58
New Mexico	0.00	0	-0.04**	-29
New York	0.05**	36	0.11**	79
New York City	0.00	0	0.13**	94
North Carolina	0.03**	22	-0.01**	-7
Ohio	-0.02**	-14	-0.06**	-43
Oregon	-0.03**	-22	-0.07**	-50
Pennsylvania	-0.04**	-29	-0.07**	-50
Rhode Island	0.12**	86	0.15**	108
Tennessee	0.12**	86	0.10**	72
Texas	-0.03**	-22	-0.04**	-29
Utah	-0.01	-7	-0.06**	-43

Savvy readers will quickly realize that the well-known differences in overall education quality across states mean that the same-sized result might mean different things in different states. A more sophisticated view of charter performance requires not just consideration of a state's average charter performance compared to their TPS counterparts, but also a way to place that performance in the relative context of the state's overall education quality. Ten or 15 days of more or less learning may not have much of an impact in a high-achieving state. However, in a state with low achievement, an additional 15 days of learning per year could be important to the future success of that state's students.

The state average charter school impacts in reading and math were plotted against the 2011 4th Grade state average results on the National Assessment of Educational Progress (NAEP). The NAEP is a national test given to a representative sample of students across each state. Average NAEP results are routinely used for national comparisons of educational achievement, often referred to as the Nation's Report Card.

Figures 24 and 25 below show 2011 average 4th grade NAEP scores on the vertical axis and average charter school growth compared to TPS on the horizontal axis. These figures represent an intersection of growth and achievement. If a state is in the lower left corner, it has both negative charter growth and low achievement on NAEP. States in the upper right corner have positive charter growth and high NAEP achievement. In both graphs, the pooled average value is designated with the bordered marker. The national average NAEP performance is marked with a horizontal red line.

Figure 24: State Average Charter School Growth Compared to 2011 4th Grade NAEP Score– Reading

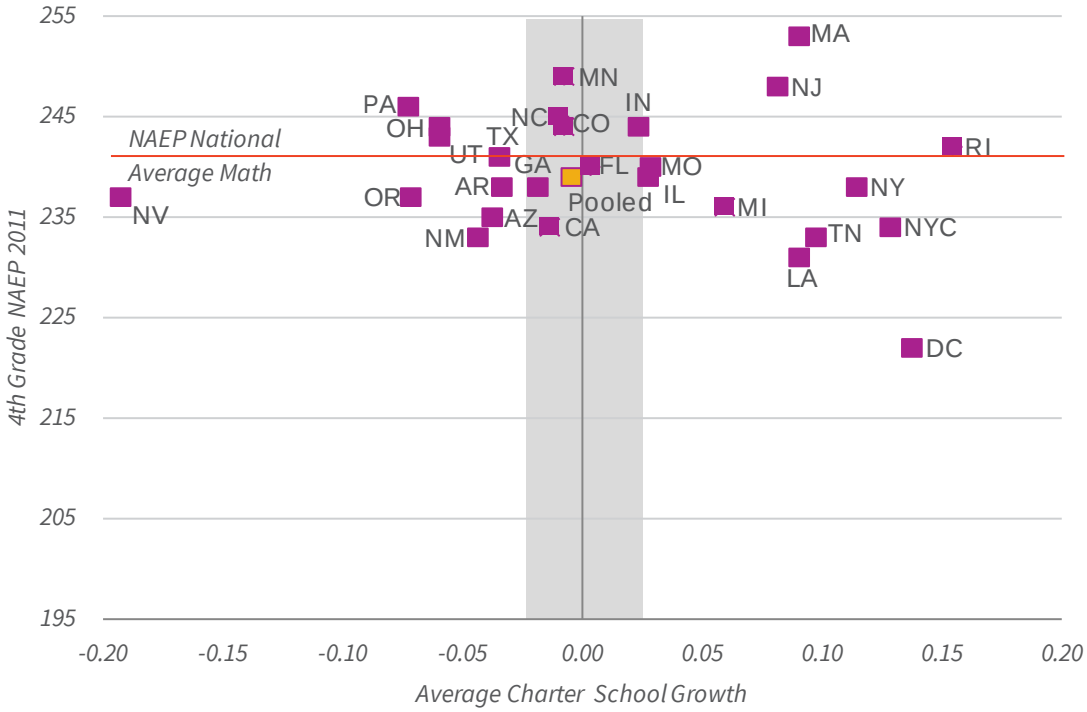


As mentioned above, it is difficult to speak about the states with growth values near zero, except to say that they appear also to be clustered around the national average reading score on 4th grade NAEP. Further, it is difficult to know whether a few days more or less learning will be a meaningful difference to the average student, especially in states with above-average achievement. Be that as it may, 11 states have average charter impacts in reading of .025 standard deviations (18 days of learning) or more. Especially of interest are those states such as the District of Columbia (72 additional days learning) and Louisiana (50 additional days) that have above-average charter effects and below-average NAEP scores. Nevada has the weakest charter growth effect in reading, equal to 108 fewer days of learning; Rhode Island has the strongest charter effect in reading at 86 additional days of learning.

Turning to math, 11 states had positive charter growth in math above .025. In math, a majority of the states with the lowest performance on NAEP have stronger charter impacts. The average charter

impact for students in the District of Columbia is equal to 101 additional days of instruction; in New York City, the amount is 94 additional days, and in Rhode Island, it is 108 additional days of learning. On the other side of the graph, Pennsylvania and Oregon charter students have the equivalent of 50 fewer days of instruction per year, and in Nevada, charter school students have 137 fewer days of learning than their TPS counterparts.

Figure 25: State Average Charter School Growth Compared to 2011 4th Grade NAEP Score– Math



School-Level Impacts

Beyond the overall and state-by-state findings, the world of charter school performance has several more layers to unpack. Parents and policymakers are especially interested in school-level performance. But school-level comparisons are fraught with challenges. Charter schools generally serve fewer students than their corresponding feeder schools. Further, some charter schools elect to open with a single grade and then 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's impact. Our criteria for inclusion was at least 60 matched charter student records over two years, or, for new schools with only one year of data, at least 30 matched charter records. Of our total sample of 3,670 schools with reading scores in the 2010 and 2011 growth periods, 248 schools had an insufficient number of

individual student records to calculate a representative school-wide average growth rate. Of the 3,654 schools with math growth in 2010 and 2011, 266 had an insufficient number.

In order to determine the current school-level charter performance, the average charter impact on student learning over the two most recent growth periods (2010 and 2011) was compared to the experience the students would have realized in their local traditional public schools.[29] The performance of the VCRs associated with each charter school provided the comparison measure of the local educational experience for each charter school. The outcome of interest is the average contribution to student learning gains for each charter school per year. The measure is expressed relative to the gains posted by the charter school students' VCRs.

Click for reading and math infographics about school-level quality in the 27 states.

Figure 26 shows the performance of charter schools relative to the TPS in their market. Based on our analyses, we found 25 percent of charter schools had significantly stronger growth than their TPS counterparts in reading, 56 percent were not significantly different and 19 percent of charter schools had weaker growth. In math, the results show that 29 percent of charter schools had stronger growth than their TPS counterparts, 40 percent had growth that was not significantly different, and 31 percent had weaker growth. These results are an improvement over those in the 2009 report, where we found that only 17 percent of charters outperformed their TPS market in math while 37 percent performed worse.

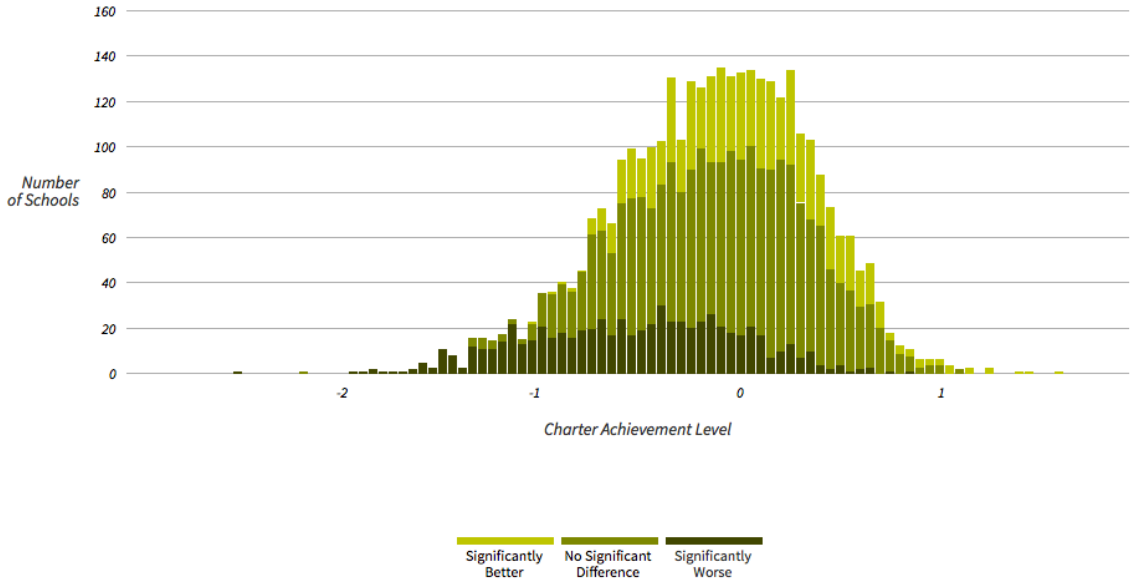
[29] We chose to base the school-level analysis on the two most recent growth periods in this analysis for two reasons. First, we wanted to base the results on a contemporary picture of charter school performance. Second, the 2-growth period time frame made it possible to include the newest schools and still ensure that performance for all the schools included the same amount of data, thereby creating a fair test for all.

Figure 26: Academic Growth of Charter Schools Compared to Their Local Markets

Conversations with policymakers across the country have revealed a misunderstanding about the results presented in Figure 26. Many people assume that all of the "significantly better" charter schools have high performance and all of the "significantly worse" charters have low performance. All the "not significantly different" are assumed to be located between these two clusters of schools. In fact, because the measures of charter school performance are relative to the local TPS alternative and TPS performance can vary, better and worse performing charter schools are found across the entire spectrum.

To illustrate, the results are presented in a different way in Figures 27 and 28. We grouped schools by achievement; that is, by how well they performed in absolute terms compared to their statewide average achievement. Charter schools with lower achievement than their statewide average are below zero to the left, while those with higher-than-average achievement are above zero to the right. We then examined how many schools in each achievement group were better than, worse than or no different than their TPS counterparts. The result is the overall distribution of schools by absolute achievement and three sub-curves that show the separate distributions of schools that are better than, worse than or no different than their local TPS alternatives at each level of achievement.

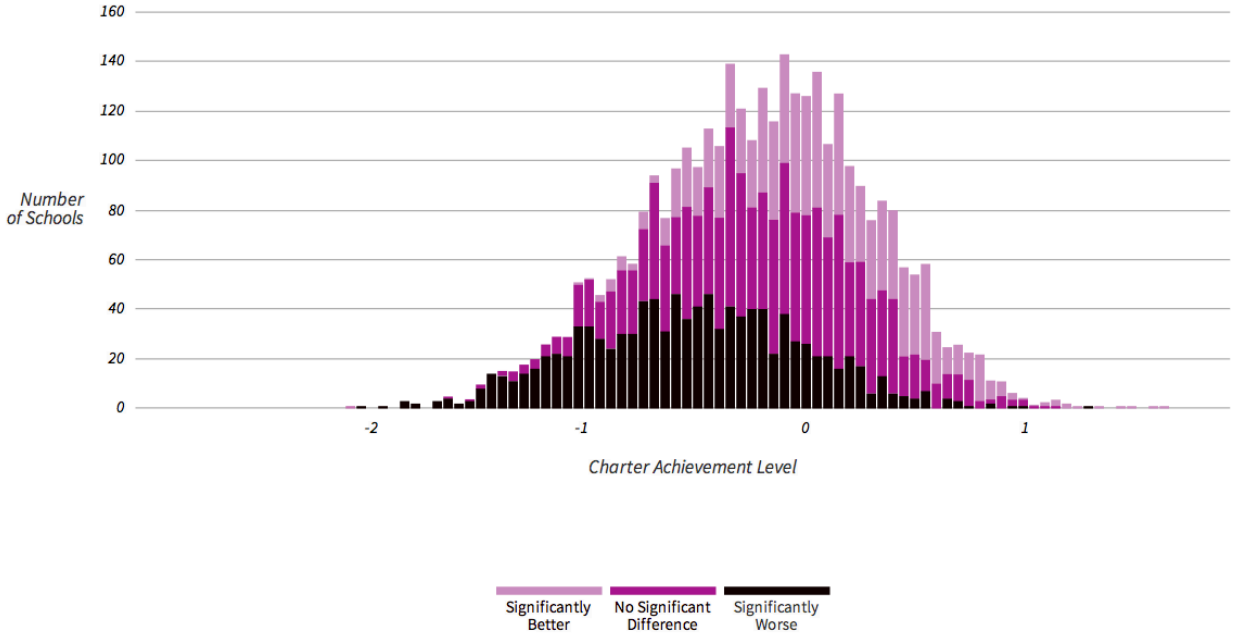
Figure 27: Comparative School Quality by Charter School Reading Achievement



In general, there are mixed levels of growth across the whole spectrum of achievement. For the 50 highest- and lowest-achieving schools, a relationship between achievement and growth does seem to exist. If there were no relationship between achievement and growth, we would expect to see equal amounts of darker and lighter green on both the left and right sides of Figure 27. The fact that there are more of the "darker green schools" (with lower growth than their market) on the left side of the figure indicates that the lowest-achieving charter schools also have weaker growth than their local markets on average.

The distribution of schools with weaker growth than their markets in math, those in dark purple, extends further to the right in Figure 28. This indicates that the schools with weaker growth than their markets are more evenly distributed across the achievement spectrum in math than is the case in reading.

Figure 28: Comparative School Quality by Charter School Math Achievement



Four Quadrant Analysis

Because many of the students served by charter schools start at lower levels of achievement, it is important to understand how well their academic growth relative to their TPS comparison advances them in absolute achievement. To do this, we create plots for reading and math that simultaneously show the school-level performance with relative academic growth and with absolute achievement.

Each school's average student growth relative to their local TPS (in standard deviation units) is plotted against their average achievement level (relative to their own state average for all public school students – traditional and charter).[30] The results are presented in Tables 15 and 16 below. 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 of the charter school's state.

ABOUT TABLES 15 AND 16

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 growth periods.

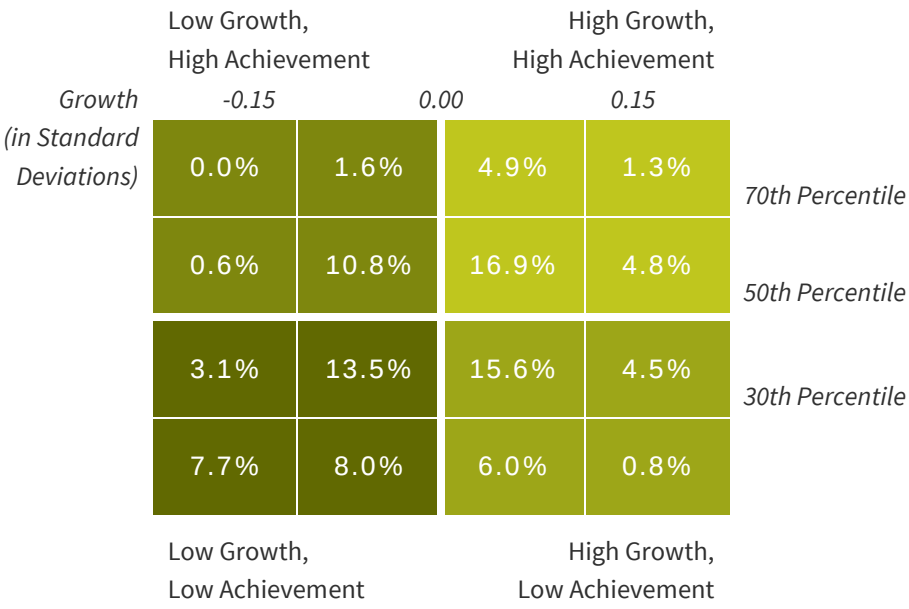
The uppermost box on the left denotes the percentage of charters with very low average growth but very high average achievement. The box in the bottom left corner is for low-growth, low-achieving schools.

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

The major quadrants were delineated using national charter school data. The majority of schools have an effect size between -0.15 and 0.15 standard deviations of growth (the two middle columns). Similarly, we would expect about 40% of schools to achieve between the 30th and 70th percentiles.

[30] Average achievement was computed using students' 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. Each percentile indicates the percentage of students in the state with lower performance than the average student at the school in question.

Table 15: Reading Growth and Achievement



Nationally, 1,876 out of 3,422 charter schools (55 percent) have positive average growth in reading, regardless of their achievement (this percentage is the sum of the squares in the right half of the table). The schools in the bottom right hand quadrant, about 27 percent of all schools, could be expected to rise into the upper right quadrant over time if their growth performance stays above average. About 28 percent of charters have positive growth and average achievement above the 50th percentile of their state (i.e., the total for the upper right quadrant). About 59 percent of charters perform below the 50th percentile of achievement (the sum of the lower half of the table). There are 32 percent of charters in the lower left quadrant. These are the schools with both low achievement and low relative growth in reading. Assuming no change in their growth performance, there is no chance for them to advance their student's overall achievement in their states' distribution.

Table 16: Math Growth and Achievement

For math, 1,668 of 3,388 schools (49 percent) have positive average growth, as seen in the right half of the table. Twenty-five percent of charter schools have both positive growth and average achievement above the 50th percentile (the top right quadrant). Just over 64 percent of charter schools have achievement results below the 50th percentile for their state (the sum of the lower half of the table). In math, 40 percent of charter schools have both lower achievement and weak growth relative to their local TPS.

Difference by Grade Span

We were interested to see if the overall charter school impacts were equivalent across grade spans (elementary, middle, high, and multi-level schools). The results of this analysis are shown in Table 17 below. The table displays the average learning gains for charter schools in each grade span compared to their corresponding TPS.

Table 17 shows that students in elementary and middle charter schools have higher learning gains than their TPS counterparts. The advantage for charter elementary students is 22 days of additional learning in reading and 14 more days in math per year. Learning gains in charter middle schools outpace TPS by 29 extra days in reading and 36 days of additional learning in math. Charter and TPS high school students have similar growth in reading and math. The weakest charter school impacts among the grade spans are at multi-level charter schools. The total learning difference for charter

students at multi-level schools is 14 fewer days of learning in reading and 50 fewer days in math compared to their TPS counterparts.

Table 17: Impact by School Grade Span

School Level	Reading	Math
Elementary	.03**	.02**
Middle	.04**	.05**
High	.00	.00
Multi-Level	-.02**	-.07**

Charter School Impacts by Student Characteristics

With the 27 states taken as a whole, the overall results show relatively small average impacts of charter school attendance on student academic growth. Charter students experience, on average, eight days of additional learning in reading and similar learning gains in math compared to TPS. However, students from different subgroups may have different results. To explore this possibility, we investigate the impact of charter school attendance on different groups of students based on several of their observable characteristics.

The evaluation of student learning impacts for each of the subpopulations helps develop an understanding of whether the charter sector has been able to deliver consistent results for all students. It is also important to determine whether charter schools are able to demonstrate better results for historically underserved groups, since this is the mission of many charter schools. Deficits in starting endowments and lower-quality education in the past have created achievement gaps between average students and those in more disadvantaged circumstances. Achievement gaps are sustained or enlarged when the growth of historically underserved students lags that of other students. For this reason, we are keen to examine the growth of all student subgroups in charter schools, but especially those from disadvantaged starting points, to see if their enrollment in charter schools culminates in better results than TPS have been able to provide. Such findings, if they exist, would be welcome news and potentially offer the chance to transfer best practices and accomplish broader positive impacts for all students.

Charter School Impacts by Race/Ethnicity

Our population is becoming increasingly diverse, and our education systems need to create strong results for all students regardless of racial or cultural background. Several groups receive extraordinary interest due to a protracted history of being underserved or excluded educationally. Our analyses include breakouts for black, Hispanic, white, and Asian students. These are the four major race/ethnic groups identified by the National Center for Education Statistics. Thus, these categories are reported by all states. The demographics chapter of this study shows that while most states also report numbers for Native American students, the number of these students is too small to provide stable estimates. Some states also report data for multiple race/ethnicity students; however, many other states do not. Due to this discrepancy, we did not include a breakout for multiracial or multiethnic students. We anticipate expanding our analysis to include these students in future reports when this designation gains widespread use.

ABOUT THE FIGURES IN THIS SECTION

The analyses for Figures 29 - 38 decompose the charter impact by various student subgroups. It is important to remember that the comparison group for each analysis will change based on the student group. The comparison group will always be TPS students with the characteristic. For example, when looking at the impact of poverty on student growth, the comparison group will be TPS poverty students.

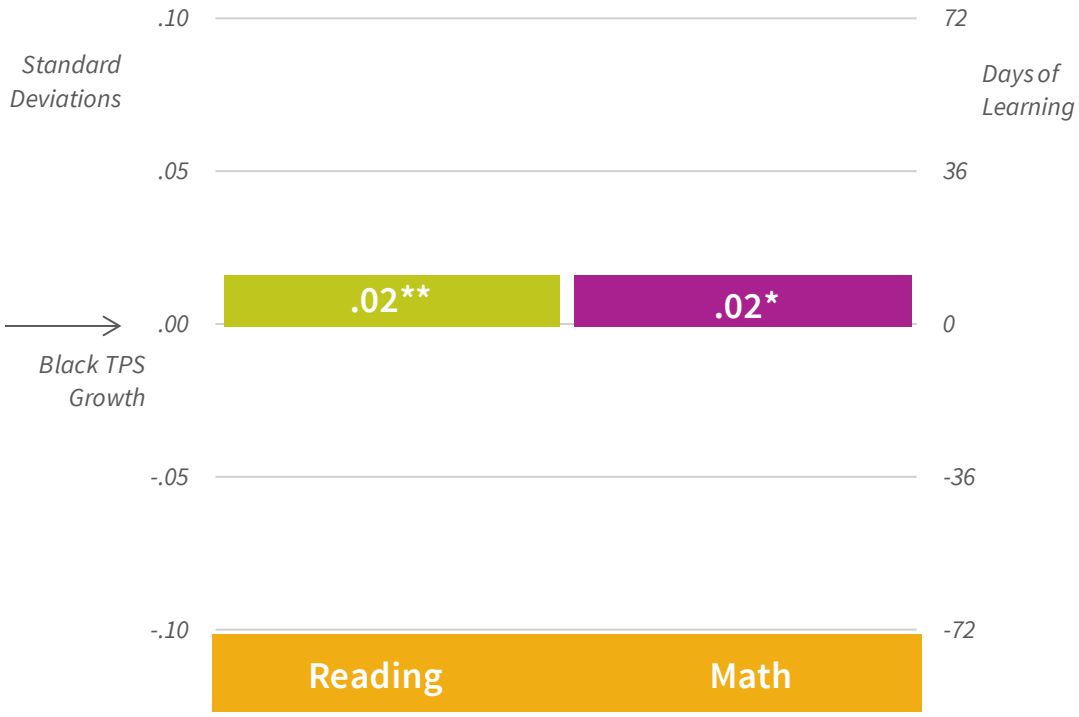
When viewing the figures for these analyses, a value above zero represents growth greater than TPS students with the same characteristics. This does not mean that the students in that group are out-growing everyone. For example, while black charter student may have stronger growth than black TPS students, the growth of black students in charters still lags that of white TPS students.

Asterisks (*) next to the number means that the performance is significantly different from the comparison group's performance in TPS (which will always be set to zero).

For the race/ethnicity breakouts, the baseline for each comparison by race/ethnicity is the growth of the TPS students in that group. This means that each graph has a different reference point for zero. It is important for readers to keep the different comparison groups in mind when looking at different graphs.

Black Students – Attending a charter school has positive impacts for black students in both reading and math. Black students who attend a charter school on average have 14 additional days of learning in both reading and math compared to black students enrolled in TPS.

Figure 29: Impact with Black Students Overall

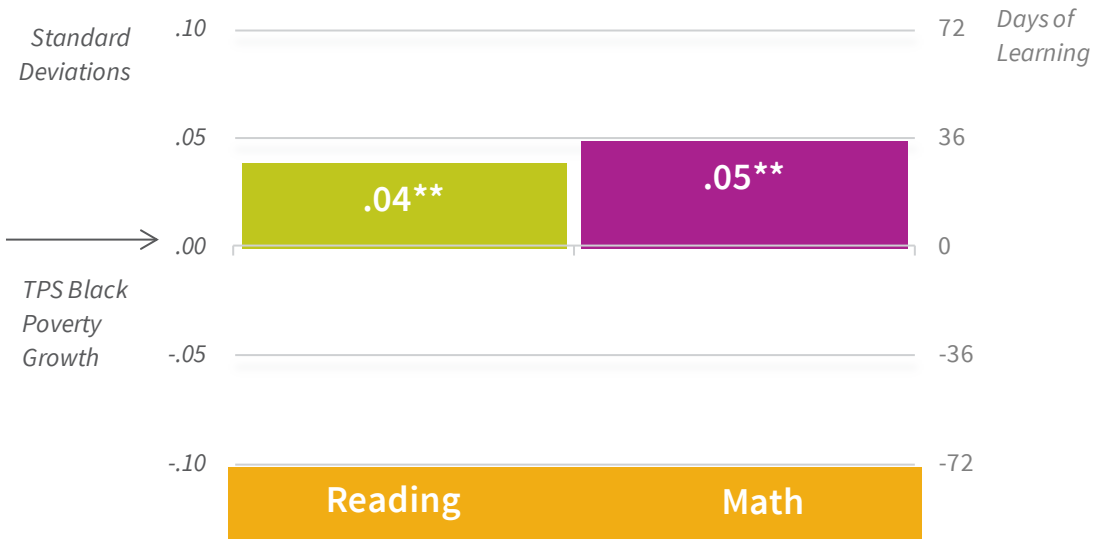


*** Significant at p ≤ 0.01*
**Significant at p ≤ 0.05*

In many parts of the country where charter schools operate, most students are both members of a minority group and live in poverty. The compound effect of these two conditions can be seen in Figure 30. Charter students who are black but not in poverty, shown in Figure 31, have academic growth that is similar to their TPS peers.

Black students in poverty who attend charter schools gain an additional 29 days of learning in reading and 36 days in math per year over their TPS counterparts (see Figure 30). This shows the impact of charter schooling is especially beneficial for black students who in poverty.

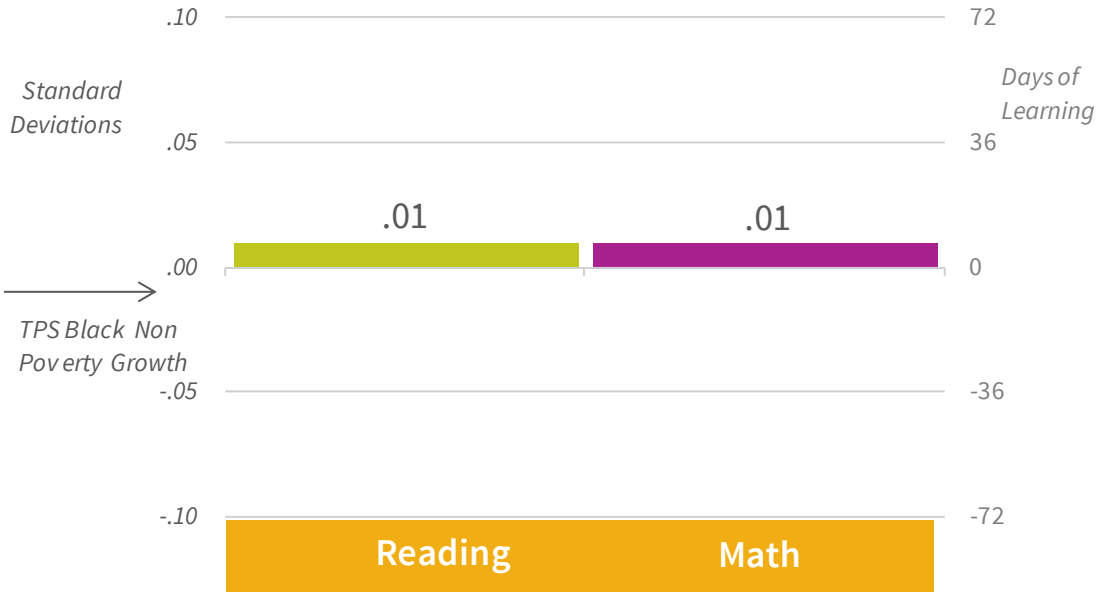
Figure 30: Impact with Black Students in Poverty



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

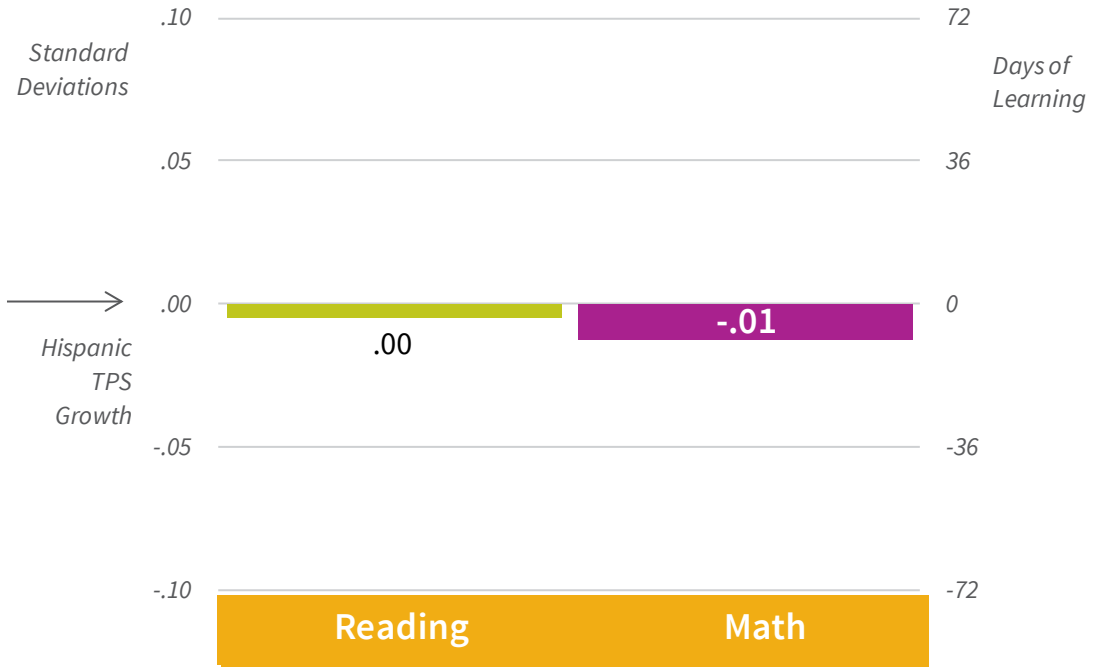
The growth for black charter students not in poverty were similar to those for their TPS counterparts.

Figure 31: Impact with Black Students Not in Poverty



Hispanic Students – The learning gains of Hispanic students attending charter schools and those attending TPS are similar, as shown in Figure 32 below.

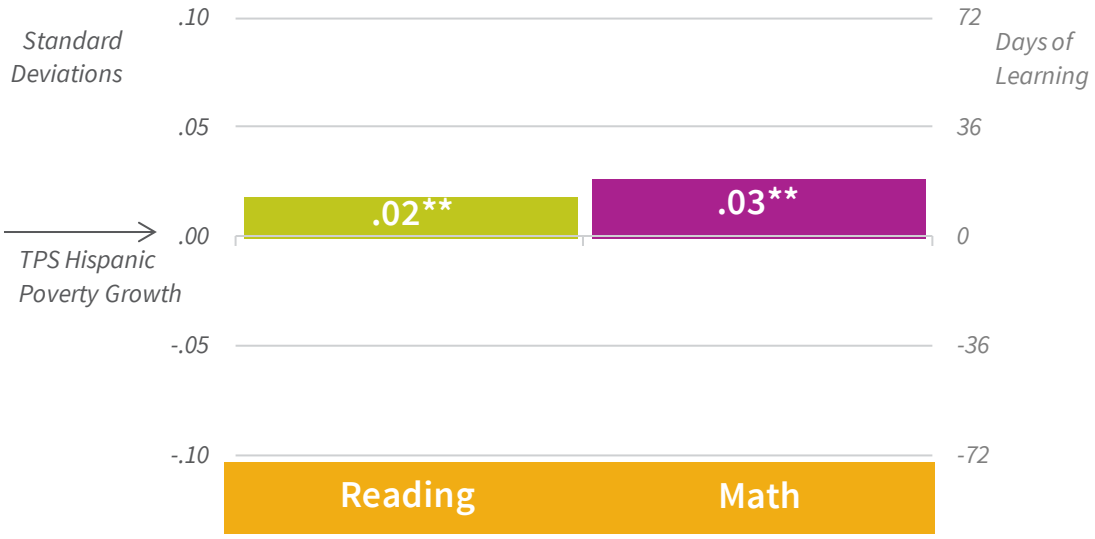
Figure 32: Impact with Hispanic Students Overall



Most racial/ethnic descriptions are broad and cover a wide variety of people from different backgrounds and lifestyles. The Hispanic population in the United States is particularly diverse. For example, there are large socioeconomic and cultural differences between established Hispanic families and those who have recently immigrated to the US. In figures 33 and 34 below, CREDO examined if Hispanic students in poverty have different impacts from charter attendance than Hispanic students who are not in poverty. The results are interesting: Hispanic students in poverty have better learning gains at charter schools than at TPS (see Figure 33), but non-poverty Hispanic students at charters have lower learning gains than their TPS peers (see Figure 34). In reading, Hispanic charter students in poverty have 14 more days of learning than similar TPS students, while Hispanic charter students who are not in poverty experience seven fewer days of learning per year than similar TPS students. The differences are even larger in math. Hispanic charter students in poverty have 22 more days of learning in math than similar TPS students, while Hispanic charter students not in poverty experience 29 fewer days of math learning gains than similar TPS students. Further analysis, including the location of charter schools (included in Supplementary Findings Appendix) shows that charter school impacts for

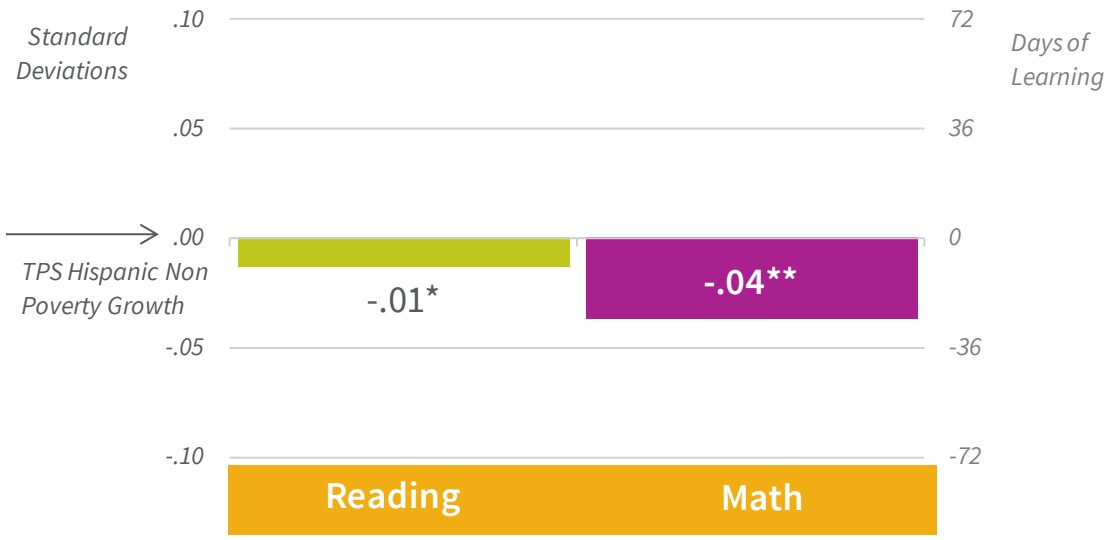
both black and Hispanic students in poverty are strongest among students attending schools in urban areas.

Figure 33: Impact with Hispanic Students in Poverty



** Significant at $p \leq 0.01$

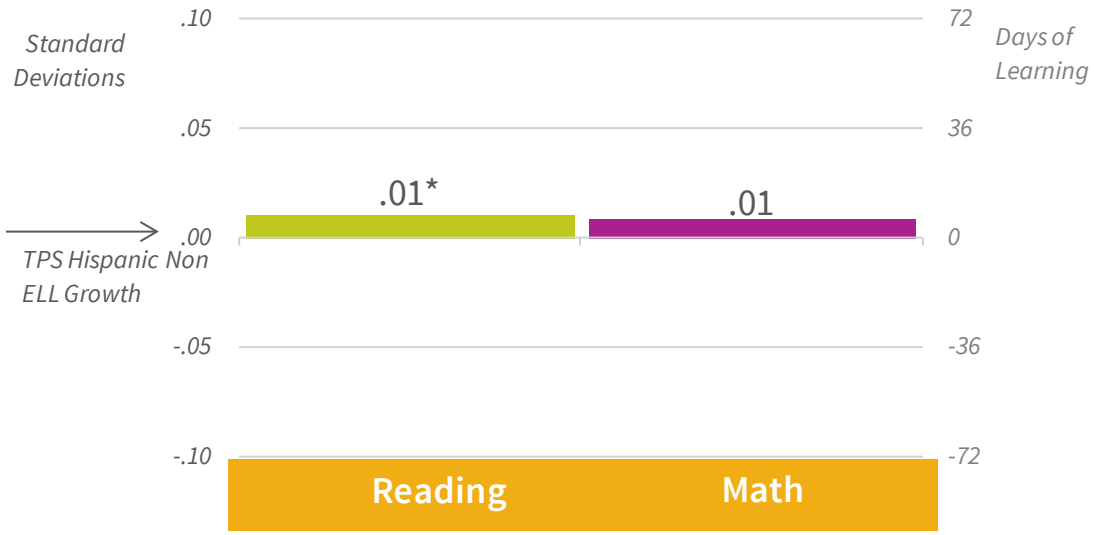
Figure 34: Impact with Hispanic Students Not in Poverty



*** Significant at p ≤ 0.01*
** Significant at p≤ 0.05*

Another way to look more deeply into the results for Hispanic students is to separate the impact of charter schools on Hispanic students based on their English language learner status. Figure 35 shows the results for Hispanic student who are **not** English language learners. Students in this group have significantly stronger growth than their TPS peers in reading but similar growth in math. The difference is equivalent to seven additional days of learning in reading.

Figure 35: Impact with Hispanic Non-English Language Learners[31]

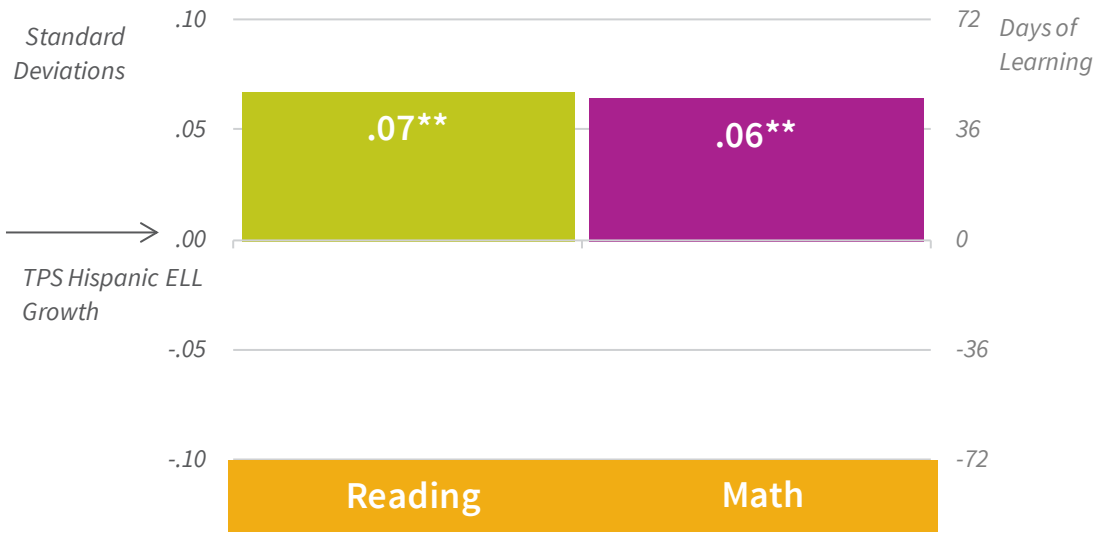


* Significant at $p \leq 0.05$

[31] Bars with equal numerical values may not be exactly same height due to rounding.

For Hispanic students who are also English language learners (ELL), learning gains at charter schools are stronger in both reading and math than the learning gains of similar students at TPS. Hispanic ELL students in charter schools gained on average an additional 50 days of learning in reading and 43 additional days in math when compared to ELL students in TPS.

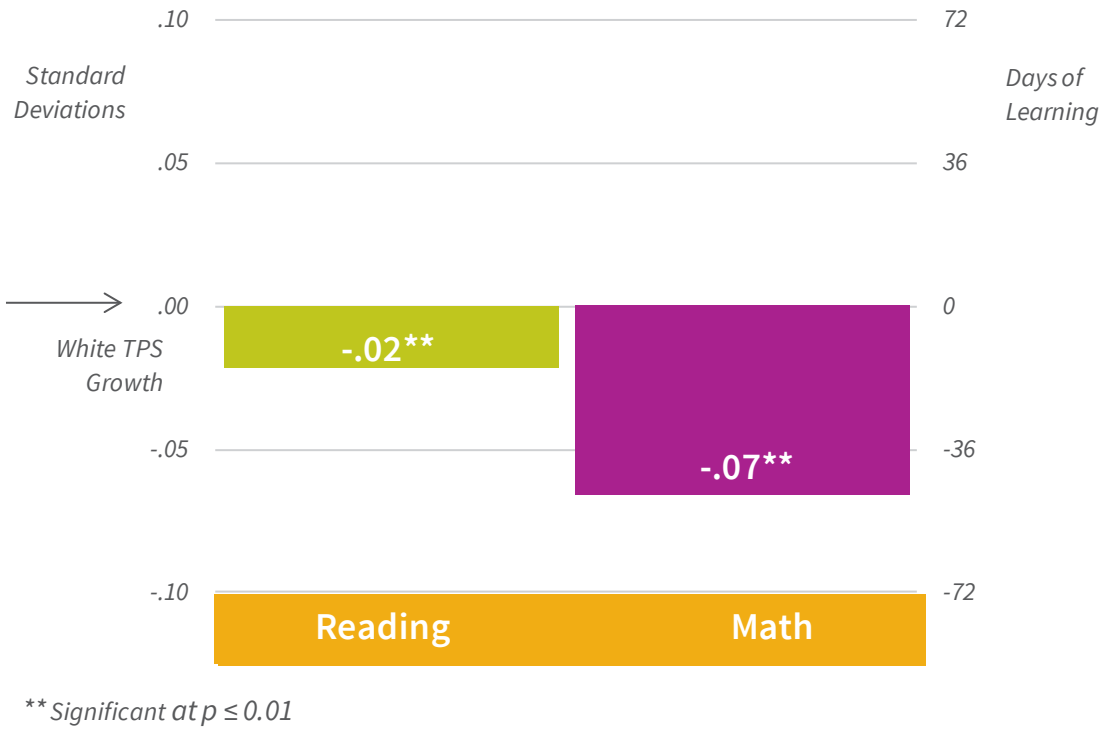
Figure 36: Impact with Hispanic English Language Learners



** Significant at $p \leq 0.01$

White Students– Figure 37 shows the impact on growth of attending a charter school for white students. White students who attend a charter school experience 14 fewer days of learning in reading than white TPS students. The learning deficit for white charter students is larger in math, amounting to 50 fewer days of learning than their TPS counterparts. Results from another recent CREDO study also showed that white students attending charter schools tend to have lower growth than white TPS students.[32]

Figure 37: Impact with White Students

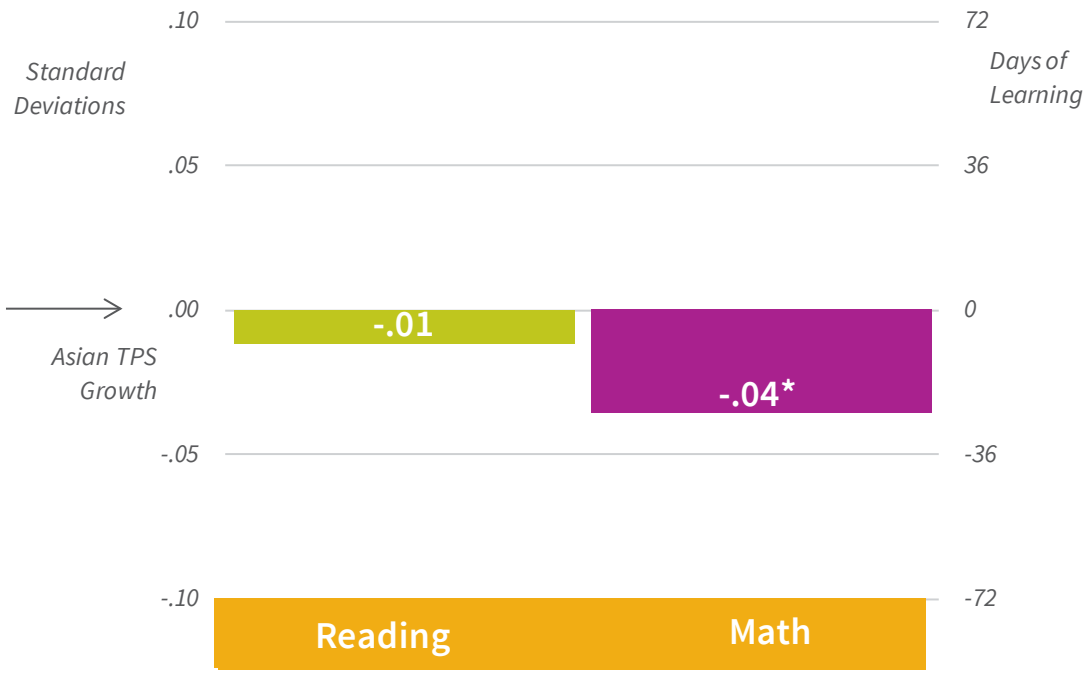


** Significant at $p \leq 0.01$

[32] Woodworth, J. L. and M. E. Raymond (2013). Charter School Growth and Replication, Vol II, Center for Research on Education Outcomes, Stanford University, Stanford, CA. Avaliable from: http://credo.stanford.edu/pdfs/CGAR%20Growth%20Volume%20II.pdf.

Asian Students – Asian students generally do not benefit from attending charter schools, as shown in Figure 38. On average, Asian students who attend charter schools have similar learning gains in reading compared to their TPS counterparts. In math, Asian students attending charter schools have 29 fewer days of learning than their counterparts attending TPS.

Figure 38: Impact with Asian Students



*Significant at $p \leq 0.05$

Charter Impacts in Context – For many student groups, the impact of attending a charter school is positive. However, these results need to be considered in the context of the academic learning gaps between most student populations and the average white TPS student in our data. For example, Hispanic students in poverty see positive benefits from attending charter schools, but even with this large boost, Hispanic students in poverty at charters still have lower learning gains than white students at TPS.

Table 18 displays the relative growth of students in various student groups compared to white TPS students. A negative number means the student group has fewer days of learning than white students attending TPS. This yearly learning gap increases the achievement gap over time. Positive values in the table represent additional days of learning for the student group compared to the average white TPS student. Over time, these learning gains reduce the achievement gap.

Table 18: Relative Growth of Student Groups Compared to White TPS Students

Student Group	Reading	Reading Days of Learning	Math	Math Days of Learning
TPS Black	-0.14**	-101	-0.16**	-115
Charter Black	-0.12**	-86	-0.14**	-101
Charter Black Poverty	-0.21**	-151	-0.21**	-151
Charter Black Non-Poverty	-0.14**	-101	-0.16**	-115
TPS Hispanic	-0.06**	-43	-0.06**	-43
Charter Hispanic	-0.06**	-43	-0.07**	-50
Charter Hispanic Poverty	-0.14**	-101	-0.13**	-94
Charter Hispanic Non-Poverty	-0.09**	-65	-0.12**	-86
Charter Hispanic ELL	-0.01	No Diffference	-0.01	No Difference
Charter Hispanic Non-ELL	-0.04**	-29	-0.03	No Difference
TPS White	0.00	0	0.00	0
Charter White	-0.02**	-14	-0.07**	-50
TPS Asian	0.08**	58	0.14**	101
Charter Asian	0.07**	50	0.10**	72

Education policy has been developed around the theory that students with certain characteristics (living in poverty, English language learners, and special education students in particular) have additional educational needs beyond the typical student.[33] Because different groups of students have different needs, particular attention should be paid to how any education reform impacts these groups. We must determine if a specific policy has a disparate impact on a particular student group.

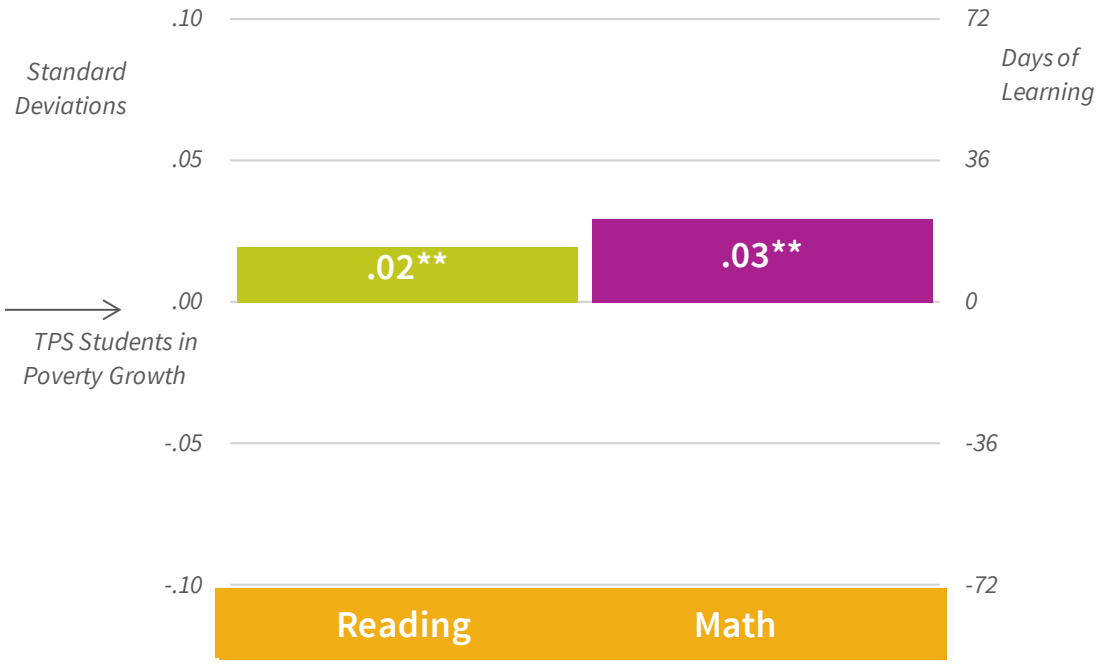
To complete this analysis, we have examined the performance of these student groups using a method similar to that used for the racial/ethnic student groups. In these comparisons, the bars in the graph represent the average growth of charter students in that subgroup compared to the average growth of TPS students in that subgroup. As with the racial/ethnic breakouts above, the impact of attending a charter school for the student group is indicated by the length of the bar in each subject.

[33] Ladd, H. F. (2008). "Reflections on Equity, Adequacy, and Weighted Student Funding." Education Finance and Policy **3**(4): 402-423. Retrieved 5 January, 2012, from: http://www.mitpressjournals.org/doi/pdf/10.1162/edfp.2008.3.4.402

Charter School Impacts with Students in Poverty

Much of the motivation behind the spread of charter schools is based on the hope of improving educational outcomes for students in poverty. Students in poverty attending charter schools have significantly stronger growth in both reading and math than their counterparts in TPS. Charter students in poverty gain the equivalent of an additional 14 days of learning in reading and 22 more days in math than TPS students in poverty. It should be noted that while these gains are beneficial for charter students, as with the racial/ethnic analyses above these gains are not large enough to offset the differences between students in poverty and students who are not in poverty.

Figure 39: Impact with Students in Poverty

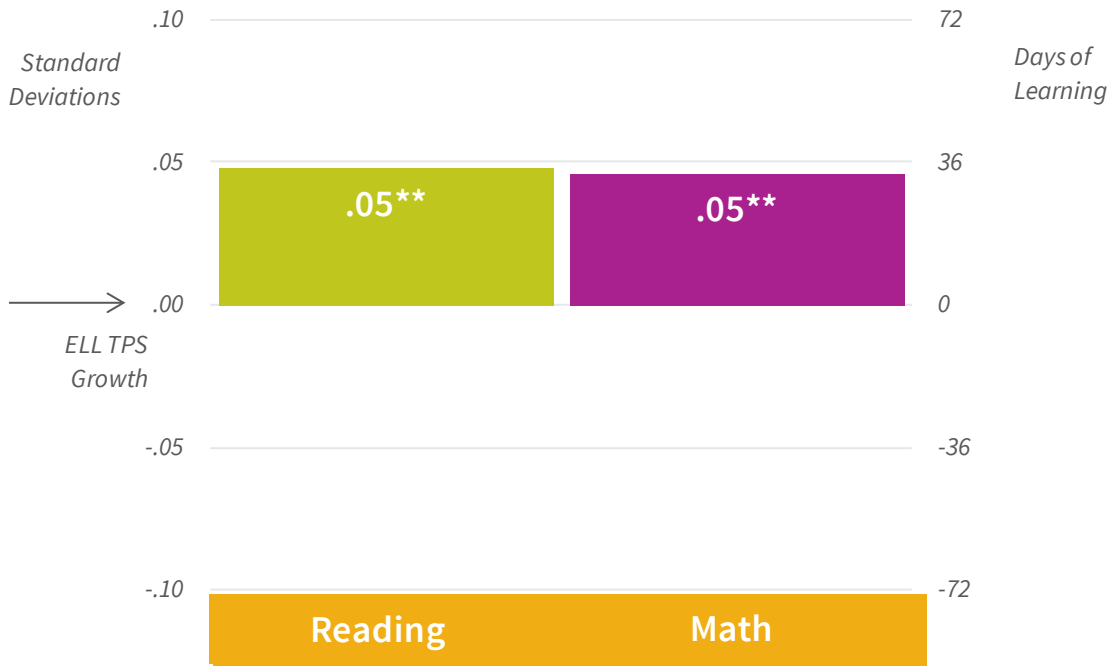


** Significant at $p \leq 0.01$

Charter School Impacts with English Language Learners

Students who are English language learners (ELL) have specific challenges that must be overcome to allow them to progress at the same rate as their native- and fluent-speaking peers. Charter ELL students have 36 more days of learning in reading per year than ELL students in TPS. The impacts for English learners are equally strong in math. ELL students attending charter schools have 36 days more learning in math than ELL students attending TPS.

Figure 40: Impact with English Language Learners

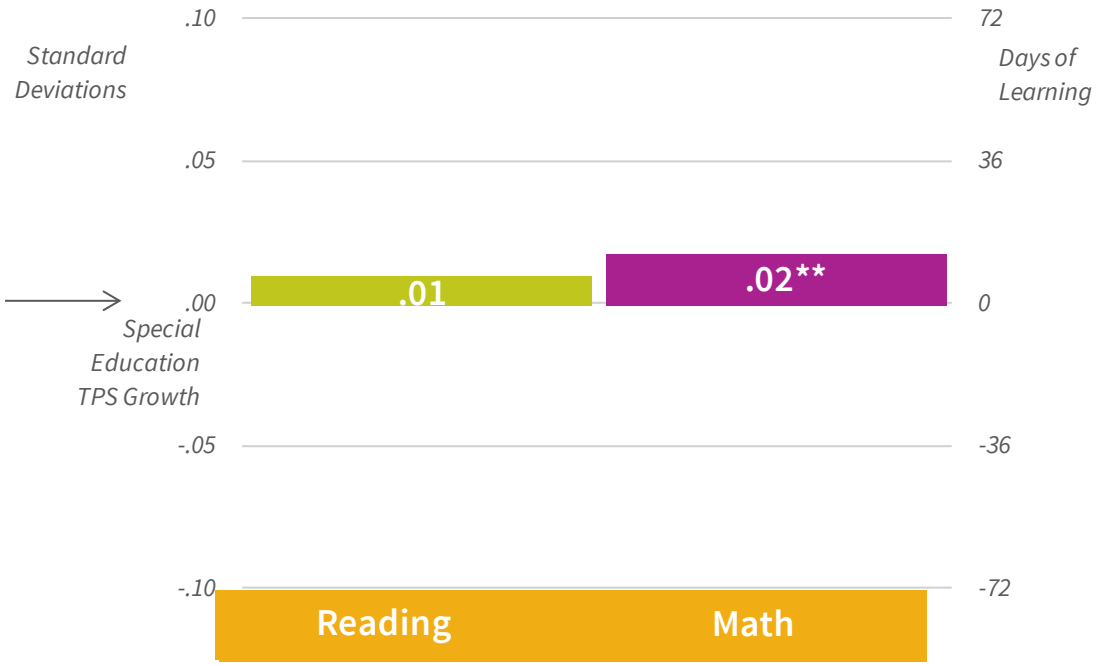


*** Significant at p ≤ 0.01*

Charter School Impacts with Special Education Students

Comparisons of growth for students receiving special education services can be extremely challenging. The special education designation is broad and covers a wide variety of needs. Since our VCR match for each special education student is a composite of several TPS students receiving special education services who all have the same starting test score, it is less likely that the exceptional needs of any one student making up the VCR will adversely impact the validity of the match. The results shown in Figure 41 show that special education students attending charter schools have similar growth in reading to their TPS peers. In math, charter students receiving special education services learn more in math than their counterparts at TPS – an additional 14 days of learning.

Figure 41: Impact with Special Education Students



** Significant at p ≤ 0.01

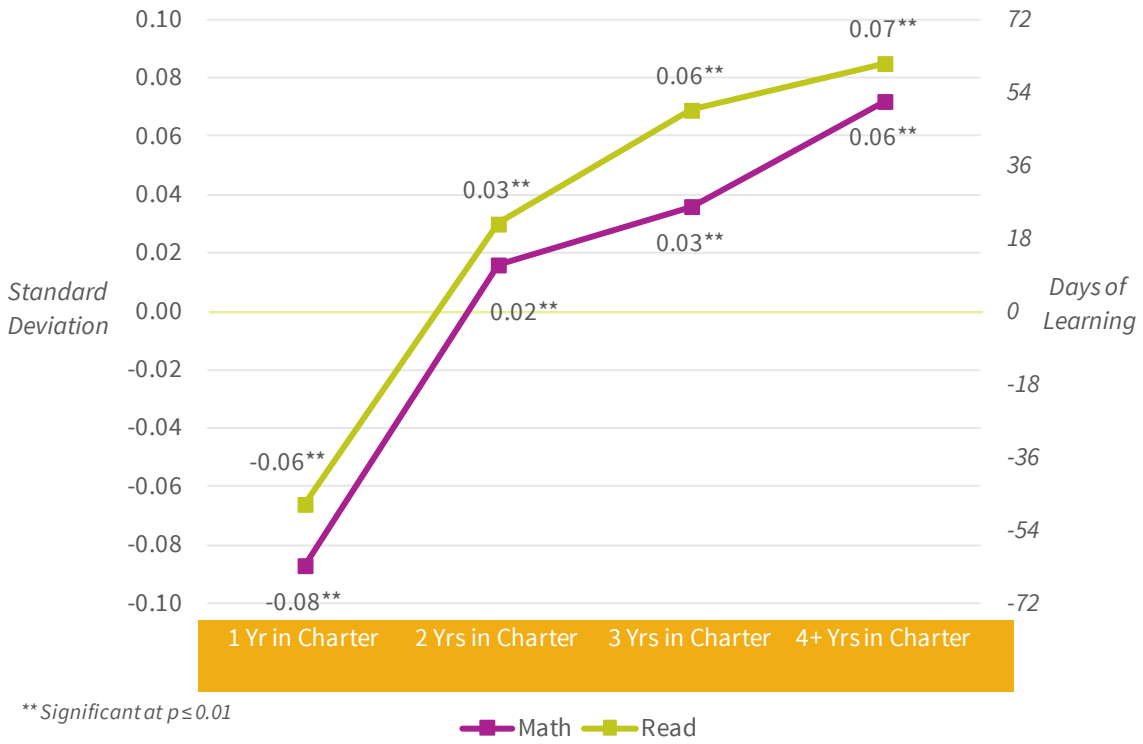
Impact on Learning by Years of Enrollment

Student growth in charter schools may change as students continue their enrollment over time. Students were grouped based on the number of consecutive years they were enrolled in charter schools. For this analysis, we studied the average gains of students who had enrolled in charter schools for one year, two years, three years, and four or more years.[34] To ensure an accurate count of the number of years a student is enrolled in a charter school, this analysis was restricted only to students who transferred into a charter school between Spring 2006 and Spring 2011. This restriction results in a smaller number of students in our data, so the outcomes of this analysis should not be contrasted with other findings in this report.

[34] The design of this analysis differs from a related one in CREDO's past work that examined "first year in charter", "second year in charter" and so on. Caution should be used when comparing results across these analyses.

The results in Figure 42 show that students who persist in charter schools for a longer period of time have stronger growth in both reading and math.[35] Students with one year of charter enrollment realize smaller learning gains than their peers in TPS in both reading and math, with the disadvantage equal to 43 and 58 fewer days of learning, respectively. Learning gains improve significantly for charter students by their second year of enrollment – seeing about 22 more days of learning in reading and 14 more days in math. Once a student is enrolled for four or more years, their learning gains outpace TPS by 50 days in reading and 43 days in math per year.

Figure 42: Impact by Students' Years of Enrollment in Charter School



[35] It should also be noted that the results in Figure 39 are the total effects for each group. The effects are not cumulative, i.e. the total effect of four plus years in charter is 52 days more learning, not -45 + 21 + 40 + 52 days.

Summary of Charter School Impacts

Overall, students attending charter schools have eight additional days of learning in reading and similar learning gains in math compared to their peers attending traditional public schools. While these average impacts aren't very large, the differences for some groups of students are much greater.

At the state level, most states have charter school impacts that are near the national average. However, some states stand out. Seven states had notably larger charter impacts in both reading and math, while one state had considerably lower-than-average charter impacts. The comparison of charter growth and statewide NAEP performance shows that the impact of attending charter schools is large in some of the states with the lowest average performance on NAEP. For students in these lower-achieving states, the additional boost from charter attendance – 99 additional days of learning in the District of Columbia and 92 days in New York City – can greatly enhance the educational opportunities of students in these states. However, states like Nevada show that charter schools are not a guaranteed solution to educational challenges.

At the school level, we find 25 percent of charter schools have stronger growth than their TPS counterparts in reading and 29 percent have stronger growth in math. But 19 percent of charters have weaker growth than TPS in reading and 31 percent have weaker growth in math. When examining growth and achievement together, 32 percent of charter schools have both weak growth and low achievement in reading and 40 percent do in math.[36] These low-growth, low-achievement charter schools are the schools that will not move their students above the 50th percentile of statewide performance on their current trajectory.

The characteristics of charter schools have an impact on student growth. Charter students attending elementary and middle schools have better learning gains in both reading and math than their TPS counterparts. However, students attending multi-level charter schools lag behind their TPS peers, especially in math. Students in charter schools that are part of a CMO have more days of learning in reading and identical learning in math compared to TPS. These results suggest that policymakers would do well to pay attention to the structure and organization of the charter schools they authorize.

[36] The measure combining growth and achievement defines low growth as being in the bottom half of schools on the growth measure. Whereas in the preceding sentence, the term low growth is defined as statistically lower growth.

Table 19: Summary of Significant Charter Impacts by Student Group

Student Group	Reading	Math
White	Negative	Negative
Black	Positive	Positive
Black Poverty	Positive	Positive
Black Non Poverty	Similar	Similar
Hispanic	Similar	Similar
Hispanic Poverty	Positive	Positive
Hispanic Non Poverty	Negative	Negative
Hispanic ELL	Positive	Positive
Hispanic Non ELL	Positive	Similar
Asian	Similar	Negative
Students in Poverty	Positive	Positive
English Language Learners (ELL)	Positive	Positive
Special Education	Similar	Positive

We also find differing impacts among various student groups, as summarized in the Table 19 above. The biggest impacts are among Hispanic students who are English language learners; they gain 50 additional days of learning in reading and 43 additional days in math from charter attendance per year. Black students in poverty at charter schools gain 29 additional days in reading and 36 additional days of learning in math. White charter students lose 14 days of learning in reading and have 50 fewer days learning in math. Likewise, Asian students attending charters have weaker growth in math, equal 29 fewer days of learning. Students in poverty, English language learners, and special education students all benefit from attending charter schools as well. Because these are students generally considered to be underserved by the TPS system, higher quality educational options for these groups are of particular interest.

6. Summary and Implications

In June 2009, CREDO released a study of charter school impacts on the academic progress of their students, *Multiple Choice: Charter School Performance in 16 States.* The current report presents the findings of a more extensive analysis of charter school effectiveness in 26 of the 43 states (including the District of Columbia) that permit charters to operate. Using student academic growth over the course of a school year as the outcome of interest, we compared the learning gains of students at charter schools with equivalent gains in virtual peers in surrounding traditional public schools (TPS). To best understand the current charter sector and its performance, we included a demographic study of the current charter student population and considered how it has changed since our last multi-state study was released. We also examined how the charter sectors had changed in the 16 states included in the original 2009 report, both to update results for the continuing charter schools and to determine whether the performance of the sector has changed over time. To offer a more complete assessment of the charter sector, we also examined the performance of charter school students in the 27 states represented in the overall study. Since 95 percent of the nation's charter school students are enrolled in charter schools in these 27 states, we are confident in expecting the patterns revealed in this study to play out across the country.

Charter schools and their feeder schools are educating more disadvantaged students than in 2009. Across the 27 states in this study, more than half of the charter students live in poverty as indicated by their eligibility for free and reduced price lunch programs (54 percent), a greater share than the US as a whole and an increase for charter schools from 2009. Since 2009, the proportion of Hispanic students in charters has begun to approach the proportion of black students. Compared to their feeders, charter schools enroll a lower percentage of white and Hispanic students and a higher percentage of black students. These shifts reflect growth in the proportion of disadvantaged parents that is aware, is informed and is comfortable exercising their options for school choice. The typical charter student arrives at a charter school with lower levels of educational performance than was the case in 2009. At the same time, charter schools display wide variation in their students' starting levels; this reflects both differences in education quality across states and differences in state charter policies that detail the communities and students charter schools may serve.

Due to the use of matched pairs of charter and TPS students in this analysis, this study cannot address the question of whether charter schools manipulate their recruitment to obtain more academically prepared students, known as cream-skimming. Such a test would require us to retrace the steps of students transferring into charter schools back to their prior feeder school and anchor their academic performance there among the students from their former school. These topics deserve further study. What we can say, however, is that the demographic trends since the earlier report point to more challenging students, not less, which would run counter to the notion of selectivity on prior education performance. CREDO also found suggestive evidence that students had falling scores in TPS in the two years prior to their switch to charter schools, which also runs counter to the cream skimming hypothesis.

The analysis of charter schools in the original 16 states covered in the 2009 report shows that they have maintained or slightly increased their impact on student learning in the intervening years. The rise in average student growth across the continuing schools is due in no small part to the closure of low-performing schools, which amounted to about 8 percent of the 2009 sample of schools. Had they remained open at their former levels of impact, there would have been no improvement for the original group of charters. If we recast the original results based only on the surviving schools, the 2009 average of student learning would rise a bit. We used this higher bar as the basis for comparing their more recent performance. The continuing schools do in fact meet the higher bar in both reading and math by slightly improving their student growth in 2013 relative to the comparison virtual control record (VCR) students.

The full picture of charter performance since 2009, however, requires knowledge of what happened to the learning gains of VCRs, since they too could differ across time. The academic gains for VCRs were lower in 2013 than in 2009. Against this lower standard, the 2013 charter results look better. However, because the new, larger impact for charter students starts from a lower VCR comparison point, the absolute levels of learning at charter schools have not changed. Thus charter schools improved their performance on this study's outcome of interest (i.e. academic growth relative to the local alternative) and also did not themselves lose ground in absolute terms like their VCRs did.

The new charter schools in the original 16 states that recently opened or had students mature into tested grades appear to look a lot like the 2009 results in average student growth. Their performance is worse than that of the continuing charters. But other factors play out as well: low-performing schools are not being shut quickly enough and some low-performing schools are being permitted to replicate. When the total stock of charter schools (continuing and new) is considered, there is slight improvement relative to the TPS alternative but no absolute gains in learning.

The performance patterns in the 16 states highlight the inherent challenge of moving school performance once it is established. Further, the evidence shows that new schools are not themselves responsible for improved quality. These findings were consistent in 14 of the 16 states. In a recent study, we called this phenomenon WYSIWYG - what you see is what you get.[37] These results make clear that the drive to higher levels of performance will not be rapid or even attainable if left exclusively to the schools themselves. It also speaks to the imbalance in the typical parent's access to information, ability to discern academic quality from other school attributes and the willingness to demand high-quality options for their children, since many continue to enroll their children in schools that are not performing as well as or better than the local TPS options. To the extent that some communities have parents who do not mirror the average, those communities can serve as examples to the rest of the charter community with respect to their outreach and education efforts.

[37] Peltason, E.H. and M. E. Raymond (2013). Charter School Growth and Replication, Vol I, Center for Research on Education Outcomes. Center for Research on Education Outcomes, Stanford University, Stanford, CA. Avaliable from: http://credo.stanford.edu/pdfs/CGAR%20Growth%20Volume%20I.pdf.

The 27 states in our study provide the widest angle view of the charter school sector to date. Across multiple measures, the students in these charter schools have shown both improved quality over the results from 2009 and an upward trend in their performance over the past five years. Compared to their likely TPS alternative, the average charter school student now gains an additional 8 days of learning each year in reading, compared to a loss of 7 days each year in the 2009 report. In math, students in 2009 posted 22 fewer days of learning; today, charter school students have equivalent levels of learning in math as their TPS peers. These results are an average of the latest three growth periods (Spring 2008 – Spring 2011). These results are reinforced by the trends in charter school performance, which show slow but steady progress over time in both reading and math.

As with the 2009 report, the amount an average charter student learns each year varies widely across states. State differences in overall education quality and geographic targeting of charter schools help to explain these differences. In reading, charter school students on average have significantly stronger growth than TPS students in 16 of the 27 states evaluated. Reading growth was weaker for charter students in eight states and similar in three states. In math, 12 state charter sectors had stronger growth than TPS, 13 states had weaker growth, and two had growth that was similar to TPS. Eleven states deserve mention as states where charter school performance outpaced TPS growth in both subjects: the District of Columbia, Illinois, Indiana, Louisiana, Massachusetts, Michigan, Missouri, New Jersey, Upstate New York, Rhode Island and Tennessee. State differences are important to keep in mind when considering the state-specific student growth results, since the same magnitude of learning gains could have very different overall effects in a state with an already-high level of school quality compared to the same gains in a state with lower overall school performance. Large advantages for charter school students relative to TPS options matter more in states with lower overall education performance. Because the base of performance is smaller, the same-sized gain represents a larger move forward, whereas in high-performing states, it would have less of an overall impact on future student outcomes.

Across the 27 states, charter elementary and middles schools have superior learning gains for their students compared to their TPS alternatives. The same could not be said of multi-level charter schools – fewer days of learning occur in those settings than their students would have received in their alternative TPS options. When we break down the average charter effect by starting achievement levels (see supplementary findings), charter school students whose starting scores are in the lowest part of the distribution (in the bottom 50 percent) learn significantly more in reading than their peers in TPS. In math, charter school students have similar learning gains compared to their TPS peers across nearly all the distribution but lower learning gains for some of the higher-performing students. These results help explain the overall differences in reading and math performance and point to areas where charter school instruction could be strengthened.

Policy makers across the country are concerned about the academic fate of all students but have a particular interest in what happens to groups with greater educational challenges either by virtue of their family background (such as living in poverty or being an English language learner) or because their

race or ethnicity is associated historically with barriers to education (as in the case of black or Hispanic students) or because they require additional education resources, as with students receiving special education services. In many states, legislation enabling charter schools explicitly ties their education missions to larger social justice aims, thereby increasing the focus on the learning outcomes of such students in charter schools.

For every student subgroup, learning outcomes for individual students range from outstanding to dismal. By looking at the average learning impacts for each student group, it is possible to compare how the group fares in charter schools compared to how their twins grew in TPS. White students fare worse on average in charter schools than in their local TPS in both reading and math while Asian charter students had weaker growth in math. In contrast, students in the following subgroups received significantly more days of learning each year in charters than their virtual twin in TPS:

- Students in Poverty (both reading and math)
- English Language Learner Students (both reading and math)
- Black Students (both reading and math)
- Black Students in poverty (both reading and math)
- Hispanic Students in Poverty (both reading and math)
- Hispanic English Language Learner Students (both reading and math)
- Special Education Students (math only)

Across minority student subgroups, it bears reminding that even though students are learning more in charter schools than in their local TPS alternatives, in both settings the prevailing achievement gap is perpetuated by smaller increments of learning for disadvantaged students compared to their white and non-poverty peers. Only when the annual learning gains of these student subgroups exceeds that of white students or non-poverty students can progress on closing the achievement gap be made. While some of the comprehensive state studies that CREDO has completed identify cases of gap-closing performance, the incidence is infrequent.

Looking at the demographics of the 27-state charter school sector, charter school enrollment has expanded among students in poverty, black students, and Hispanic students. These are precisely the students that, on average, find better outcomes in charter schools. These findings lend support to policies that focus on education as a mechanism to improve life outcomes for historically underserved students.

While much ground remains to be covered, charter schools in the 27 states are outperforming their TPS peer schools in greater numbers than in 2009. Our outcome of interest reflects performance from a comparative perspective, judging charter school growth in relation to the local level of academic quality among TPS in the same community. As displayed in Table 20 below, a quarter of charter schools outperform their local TPS alternatives in reading, and 29 percent do so in math. The figure from 2009 was 17 percent of schools with stronger gains in math and 37 percent with smaller gains than the comparison TPS performance. And the share of charter schools that produced inferior outcomes compared to their local TPS has declined to 19 percent of schools in reading and 31 percent in math.

Table 20: Performance of Charter Schools Compared to Their Local Markets in the 27 States

Subject	Worse Growth Than Comparison	Growth No Different from Comparison	Better Growth Than Comparison
Reading	19%	56%	25%
Math	31%	40%	29%

As is widely known, many of these communities have schools that are nothing to brag about. Judging charter schools on their own footing, not simply by the prevailing standards of their environment, is also important. To measure how much they contribute to student academic growth is clearly essential. But ultimately, students need to be prepared for "what comes next," be it the next grade span or post-secondary education or career advancement, so absolute achievement is also important. Of course these are related: if a school produces exceptional growth with their students, that work will ultimately drive up their absolute level of achievement. Conversely, if charter schools do not deliver equivalent increments of learning each year to the prevailing average growth in their state, their students will fall in the state-wide distribution of achievement. Looking at both factors simultaneously, schools fall into one of four groups. Table 21 shows how the charter sector across the 27 states breaks out into the four groups in reading and math.

Table 21: Charter School Growth & Achievement in the 27 States

Growth & Achievement	Reading	Math
Low Growth, Low Achievement	32%	40%
Low Growth, High Achievement	13%	11%
High Growth, Low Achievement	27%	24%
High Growth, High Achievement	28%	25%

Nearly half the charter schools in our analysis have above average growth in both reading and math, which positions them to either already have high levels of attainment or on a course to reach it. But clearly, the “Low-Low” schools are a matter of serious concern. They actively contribute to the differences in what students learn each year and offer little chance for their students to keep up, much less make up the existing differences in achievement for disadvantaged students.

Implications

We hold an enduring interest in finding ways to improve the education and life outcomes for America's children. To that end, the quality of schooling must be improved. The findings presented in this report lay the foundation for drawing a number of implications about the drive for quality in the charter school sector. They draw on the larger scope of the present analysis and the prevalent patterns in the evidence. The implications address both sides of the foundational mantra of charter schools "Flexibility for Accountability."

1. Moving the needle for 2 million students is no small feat. Over the five growth periods in this study, we see slow and steady progress in the performance of the charter school sector. The numbers align with the evolving concern over the past five years about charter school quality and, we believe, reflect the serious attention paid to the subject. The dialogue among educators, policy makers, community members and a growing fraction of parents and students has raised awareness and commitment to the academic quality of charter schools. Several charter-related organizations, including operators, authorizers, funders, charter support organizations, and national groups, have taken on the challenge of assuring quality in the sector, in some cases against their own self-interest. The progress reported here is important not only to the charter school movement but as a more general example of school improvement efforts.

For the future charter sector to attain higher performance, more work is needed. Efforts to expand the role of parents as consumers and advocates for high quality education are essential; only when large numbers of families are fully vested and engaged will there be sufficient clout to realize the goal of high quality seats for all charter school students. In addition, charter school operators and their support organizations could emulate the proven practices in the higher performing charter schools.

2. What do the current findings portend for continued advances in the quality of the charter sector? The results show WYSIWYG among existing schools (“What You See Is What You Get”). That academic performance in schools does not change much over time implies two things. First, while the actual degree of autonomy that charter schools enjoy differs from place to place, they typically have more freedom than local TPS to structure their operations and allocate resources to address the needs of their students. Even with this decentralized degree of control, we do not see dramatic improvement among existing charter schools over time. In other words, the charter sector is getting better on average, but not because existing schools are getting dramatically better; it is largely driven by the closure of bad schools.

Our analysis suggests that in many places, the standards of performance are set too low, as evidenced by the large number of underperforming charter schools that persist. The point here is that, as with students, setting and holding high expectations is an important feature of school policies and practices. More focus is required of authorizers and charter school governing boards to set high performance and accountability standards and hold charter schools to them.

3. The fact that existing schools on average don't make strong improvements draws a second implication: the quality of the sector is largely determined by who is permitted to obtain a charter. The first part of the bargain, “Flexibility,” ought to be treated as a privilege. Moreover, it is necessary to move beyond the assertion that it is hard to discern quality before a school opens and begin to build evidence about what plans, models, personnel attributes, and internal systems provide signals that lead to high-performing schools. A body of expertise in "picking winners" is vital to the long-run success of the sector.

4. That the percentage of high-performing charter schools is growing is good news. The results point to large strides in some locations and with some of our most needy students. Charters serving minority students in poverty, students in poverty and English language learners are posting stronger results both against their 2009 record and against their current TPS counterparts in closing the learning gap for these students. At the same time, it is important to be mindful that in many communities, the relative comparison is based on a prevailing level of performance that remains far below what students need to succeed academically. Simply put, there’s more mountain to climb, and charter schools need to keep the target of absolute levels of learning in view.

There appear to be distinct "sub-sectors" with very different outcomes. The slice of the charter sector that serves predominantly white or Asian students or those mostly enrolling non-poverty students do not generally deliver greater learning gains than similar students in local TPS. Many of these schools appear in the "Low Growth - High Achievement" portion of the sector, meaning the students start out educationally well off but the schools do not contribute to their development as strongly as other schools. The results suggest that charter schools may eventually require differentiation in the way they are evaluated. Schools in the “Low Growth – High Achievement” and “High Growth – Low Achievement” quadrants raise different questions about performance standards. It may be acceptable that a charter school provides somewhat lower results in a setting where the prevailing achievement is high, but it ought to provide some compensating benefits. On the other hand, should a school that routinely achieves high growth with students who have low starting points be at risk of closure if they retire some, but not all, of the achievement gap? These are questions that require continued exploration and policy guidance. Looking at the value-add of a school is critical, but so too is the overall preparation of students for their future. As the availability of and access to performance data becomes more widespread, it becomes easier to discern the differences across schools in who they serve and how well they serve them. This implies the need for parallel development of more nuanced charter school selection and renewal practices based, we hope, on consideration of both the school’s contribution to academic progress and also to the absolute achievement and readiness of their students.

5. If anything, the findings in this report, particularly the behavior of the continuing charter schools in the 16 states, show that advances in quality rest in no small way on the resolve to close schools. This is the back half of the "Flexibility for Accountability" design. We saw in the 2009 results in the 16 states that the average performance of these schools rose when 8 percent of the group was closed (unsurprising, given that the closed schools had lower than average performance). Clearly, the path to a robust charter sector does not lie entirely through closure, but its use has increased to good effect since the release of the 2009 report. It is important to stress that the impact of poorly performing schools extends beyond the unfortunate students enrolled there. The political sensitivity of school choice leaves the door to criticism open when underperforming charter schools are allowed to continue. The license to close bad schools is the insurance policy the sector possesses. There is no doubt that care is needed in how closures are handled (witness the District of Columbia and Georgia, both of which closed the same percentage of schools but which resulted in improved performance of the charter sector in DC but flat results in Georgia). But equally obvious is that allowing the closure option to rest unexercised will lead to atrophy of what we have come to view as a singular and unique feature of charter schools. Much like representative democracy, it is critical that when needed, people can "throw the rascals out."

6. Since it will take a while before the charter sector as a whole is able to solidly ground charter selection decisions primarily in evidence-based knowledge, the use of the option to close bad schools represents the strongest available tool to improve overall sector quality for the time being.

To illustrate the sector shifts we would expect to result from stronger policies on school closure, we have created a set of five closure scenarios. Displayed in Table 22 below, each involves removing a portion of the charter schools included in the current analysis. The criteria for closure differ – some sort on academic growth, some on persistently low achievement and others on underperformance relative to the local TPS alternatives.

A. Every charter school with **growth** less than -0.4 standard deviation units is dropped.
B. Every charter school with **significantly lower growth than TPS** (i.e., every "dark" school in the quality curve regardless of absolute performance) is dropped.
C. Every charter school in the **bottom 10 percent of schools by growth and quality level** is dropped. In other words, start at the bottom of the quality curve and move to the right, dropping schools with significantly worse growth than TPS until you reach 10% of the total charters.
D. Every charter school with **achievement** less than -0.4 standard deviations is dropped.
E. Every charter school in the **bottom 10 percent of achievement** is dropped.

Each decision rule seems to have surface plausibility as a means to improving the sector, though we take no stand on any of them. The aim here is to illustrate the impact of closures and the range of overall charter sector quality shifts that could be realized through closure alone. Table 22 below also

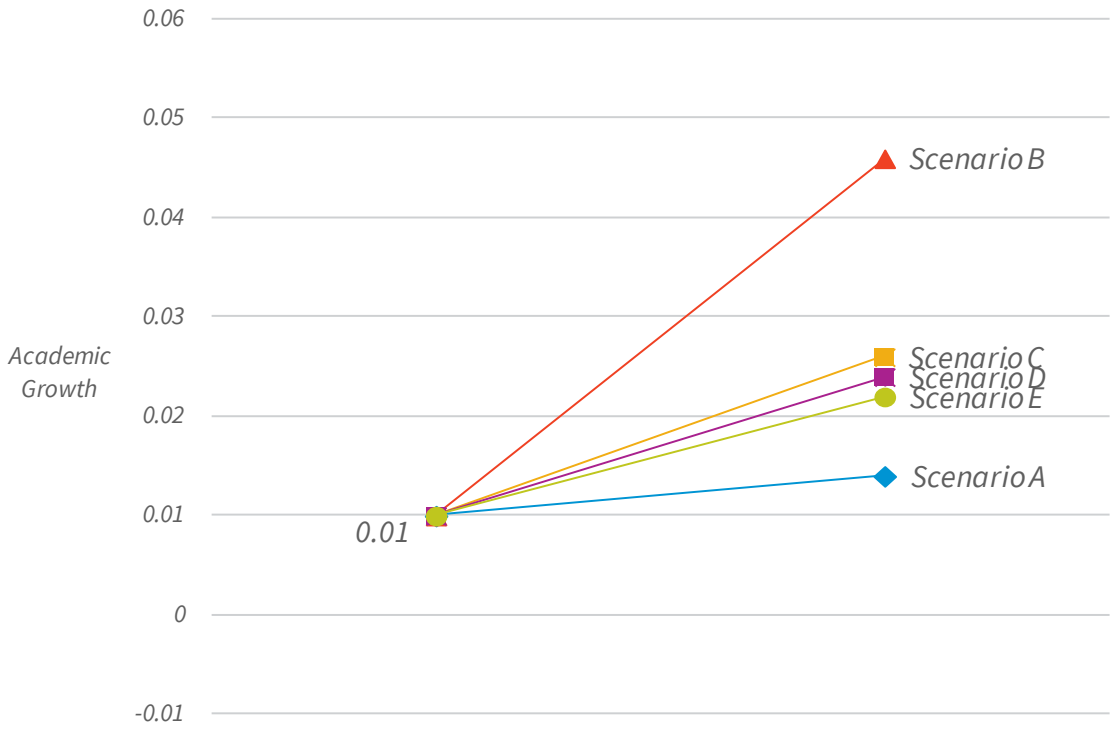
displays the alternative criteria for closure and shows how many schools included in this analysis would be affected based on their reading or math performance.

Table 22: Number of Schools Closed Under Each Scenario

Scenario		Reading	Math
A	Growth Less Than -0.4 Standard Deviation Units	70	100
B	Significantly Lower Growth Than TPS	667	1,046
C	Bottom 10% of Schools By Growth and Quality Level	342	338
D	Achievement Less than -0.4 Standard Deviation Units	475	589
E	Bottom 10% of Achievement	342	338

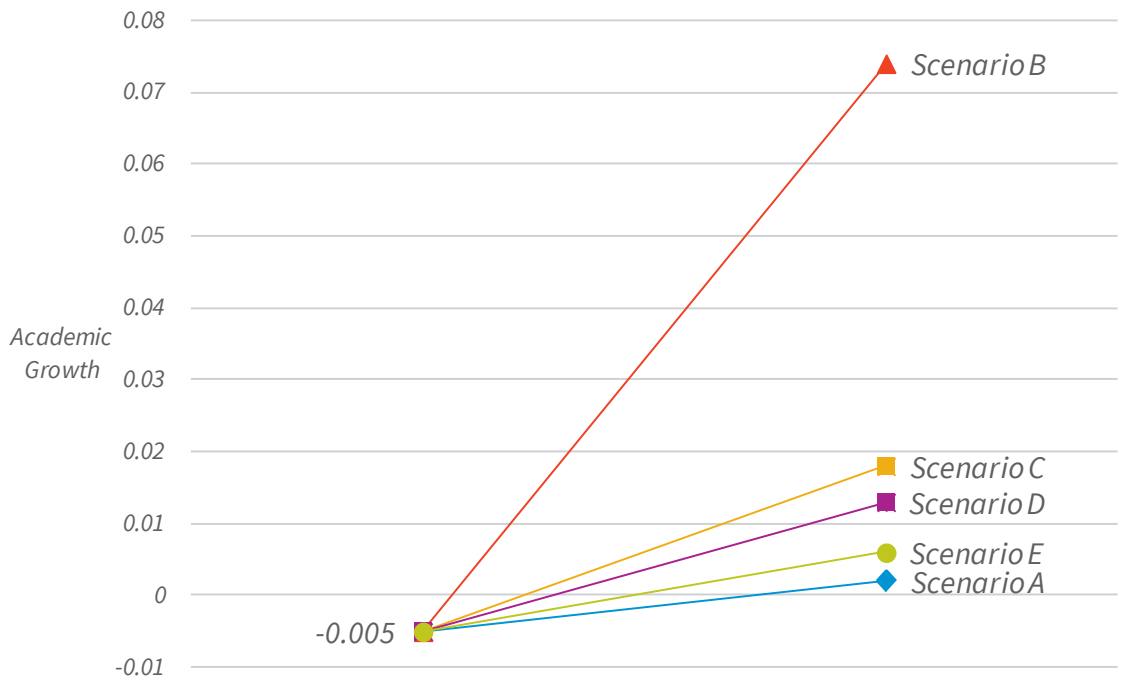
The range of impacts of each scenario on the overall quality of the charter sector is striking. Figure 43 below maps the current measure of charter school impact in reading on the left to the resulting value under each scenario on the right. From the current sector-wide average reading advantage of .01 standard deviations of growth, every closure scenario results in an increase in average growth. The new average levels of growth range from .016 standard deviations (which equates to 12 days of learning) under Scenario A to nearly .05 standard deviations under Scenario B, a substantial gain of 36 more days of learning per year than in comparable TPS.

Figure 43: Simulated Impacts of Closure Scenarios on Charter Sector Performance -- Reading



The effects are even more dramatic in math. Recall that the overall performance of the charter sector is similar to TPS in math; -.005 standard deviations of average yearly growth relative to comparable TPS, although this difference is not statistically significant. Three of the five "drop" scenarios lead to a significant improvement in the overall quality of the sector, raising the average growth of the sector higher than in comparable TPS. The new measures of average growth for the sector range from .002 standard deviations (about 1 day of extra learning per year) under Scenario A to nearly .08 standard deviations (about 58 days of extra learning per year) under Scenario B.

Figure 44: Simulated Impacts of Closure Scenarios on Charter Sector Performance -- Math



The purpose of these simulations is not to advocate for any particular approach. Rather, the different scenarios make obvious the fact that the impact on quality that accompanies closure is more dramatic and enduring than efforts to improve the current stock of schools. The glimpse of what the future holds provided by these scenarios should quicken the collective resolve to use closure policies where charter schools are clearly underperforming. If the commitment to quality is to be fully realized, everyone needs to put the interest of students first and use all the resources at their disposal to ensure the best possible student outcomes.

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