

# Multiple Choice: Charter School Performance in 16 States

## Answer Sheet

Student Name (Last, First MI)

If you do not have a preprinted form, please fill in the information in this box.

Student ID

Student Name  
(Last, First MI)

Date of Birth (MMDDYYYY)

1. Arkansas

A B C D E

2. Arizona

A B C D E

3. California

A B C D E

4. Colorado (Denver)

A B C D E

5. District of Columbia

A B C D E

6. Florida

A B C D E

7. Georgia

A B C D E

8. Illinois (Chicago)

A B C D E

9. Louisiana

A B C D E

10. Massachusetts

A B C D E

11. Minnesota

A B C D E

12. Missouri

A B C D E

13. New Mexico

A B C D E

14. North Carolina

A B C D E

15. Ohio

A B C D E

16. Texas

A B C D E



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**Center for Research on Education Outcomes (CREDO)**  
**Stanford University**  
**Stanford, CA**  
**<http://credo.stanford.edu>**  
**June 2009**

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# I. EXECUTIVE SUMMARY

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## INTRODUCTION

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As charter schools play an increasingly central role in education reform agendas across the United States, it becomes more important to have current and comprehensible analysis about how well they do educating their students. Thanks to progress in student data systems and regular student achievement testing, it is possible to examine student learning in charter schools and compare it to the experience the students would have had in the traditional public schools (TPS) they would otherwise have attended. This report presents a longitudinal student-level analysis of charter school impacts on more than 70 percent of the students in charter schools in the United States. The scope of the study makes it the first national assessment of charter school impacts.

Charter schools are permitted to select their focus, environment and operations and wide diversity exists across the sector. This study provides an overview that aggregates charter schools in different ways to examine different facets of their impact on student academic growth.

The group portrait shows wide variation in performance. The study reveals that a decent fraction of charter schools, 17 percent, provide superior education opportunities for their students. Nearly half of the charter schools nationwide have results that are no different from the local public school options and over a third, 37 percent, deliver learning results that are significantly worse than their student would have realized had they remained in traditional public schools. These findings underlie the parallel findings of significant state-by-state differences in charter school performance and in the national aggregate performance of charter schools. The policy challenge is how to deal constructively with varying levels of performance today and into the future.

## PROJECT APPROACH

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CREDO has partnered with 15 states and the District of Columbia to consolidate longitudinal student-level achievement data for the purposes of creating a national pooled analysis of the impact of charter schooling on student learning gains. For each charter school student, a virtual twin is created based on students who match the charter student's demographics, English language proficiency and participation in special education or subsidized lunch programs. Virtual twins were developed for 84 percent of all the students in charter schools. The resulting matched longitudinal comparison is used to test whether students who attend charter schools fare better than if they had instead attended traditional public schools in their community. The outcome of interest is academic learning gains in reading and math, measured in standard deviation units.

Student academic learning gains on reading and math state achievement tests were examined in three ways: a pooled nationwide analysis of charter school impacts, a state-by-state analysis of charter school results, and an examination of the performance of charter schools against their local alternatives.

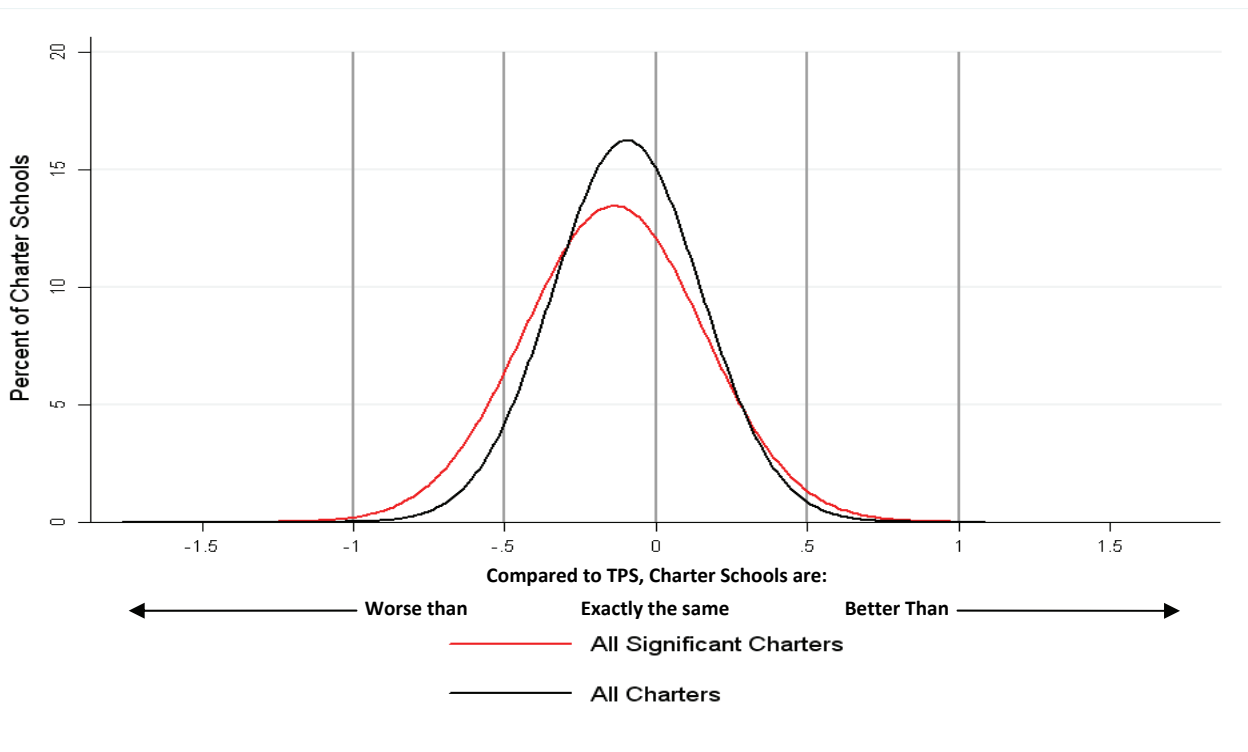
In all cases, the outcome of interest is the magnitude of student learning that occurs in charter school students compared to their traditional public school virtual twins. Each analysis looks at the impact of a variety of factors on charter school student learning: the state where the student resides, the school's grade-span, the student's background, time in charter schools, and a number of policy characteristics of the charter school environment.

## SUMMARY OF FINDINGS

Charter school performance is a complex and difficult matter to assess. Each of the three analyses revealed distinct facets of charter school performance. In increasing levels of aggregation, from the head-to-head comparisons within communities to the pooled national analysis, the results are presented below.

When the effect of charter schools on student learning is compared to the experience the students would have realized in their local traditional public schools, the result can be graphed in a point-in-time Quality Curve that relates the average math growth in each charter school to the performance their students would have realized in traditional public schools in their immediate community, as measured by the experience of their virtual twins. The Quality Curve displays the distribution of individual charter school performance relative to their TPS counterparts. A score of "0" means there is no difference between the charter school performance and that of their TPS comparison group. More positive values indicate increasingly better performance of charters relative to traditional public school effects and negative values indicate that charter school effects are worse than what was observed for the traditional public school effects.

**Charter School Market Fixed Effects Quality Curve**





The Quality Curve results are sobering:

- Of the 2403 charter schools reflected on the curve, 46 percent of charter schools have math gains that are statistically indistinguishable from the average growth among their TPS comparisons.
- Charters whose math growth exceeded their TPS equivalent growth by a significant amount account for 17 percent of the total.
- The remaining group, 37 percent of charter schools, posted math gains that were significantly below what their students would have seen if they enrolled in local traditional public schools instead.

The state-by-state analysis showed the following:

- The effectiveness of charter schools was found to vary widely by state. The variation was over and above existing differences among states in their academic results.

States with significantly higher learning gains for charter school students than would have occurred in traditional schools include:

- Arkansas
- Colorado (Denver)
- Illinois (Chicago)
- Louisiana
- Missouri

The gains in growth ranged from .02 Standard deviations in Illinois (Chicago) to .07 standard deviations in Colorado (Denver).

States that demonstrated lower average charter school student growth than their peers in traditional schools included:

- Arizona
- Florida
- Minnesota
- New Mexico
- Ohio
- Texas

In this group, the marginal shift ranged from -.01 in Arizona to -.06 standard deviations in Ohio.

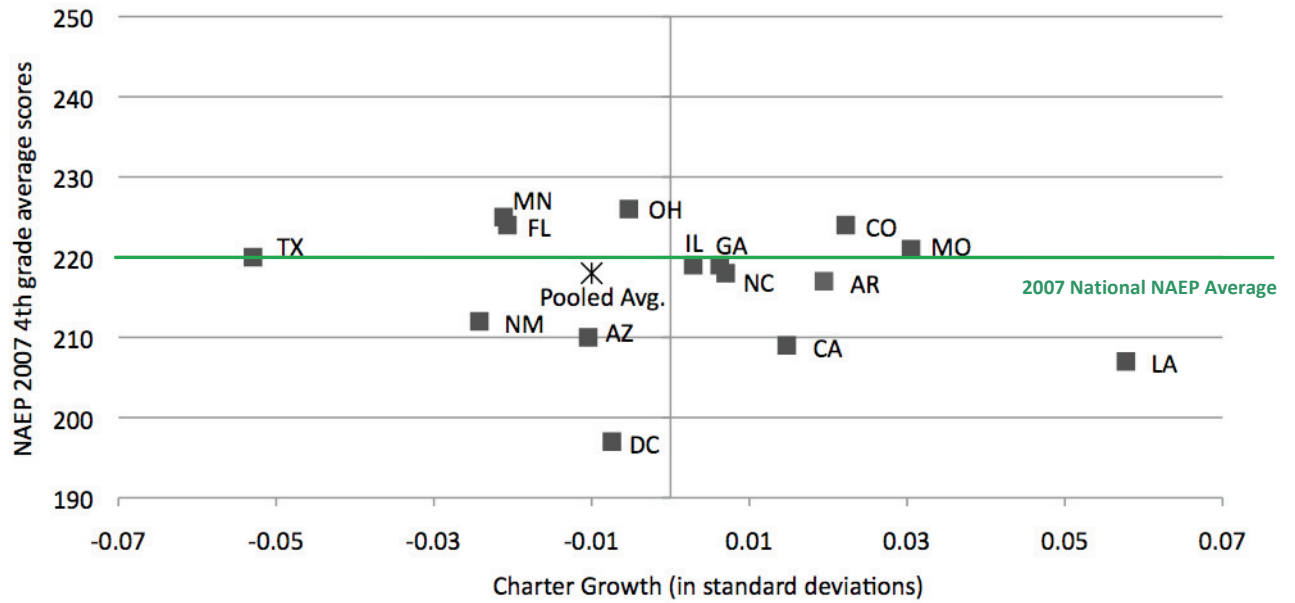
Four states had mixed results or were no different than the gains for traditional school peers:

- California
- District of Columbia
- Georgia
- North Carolina

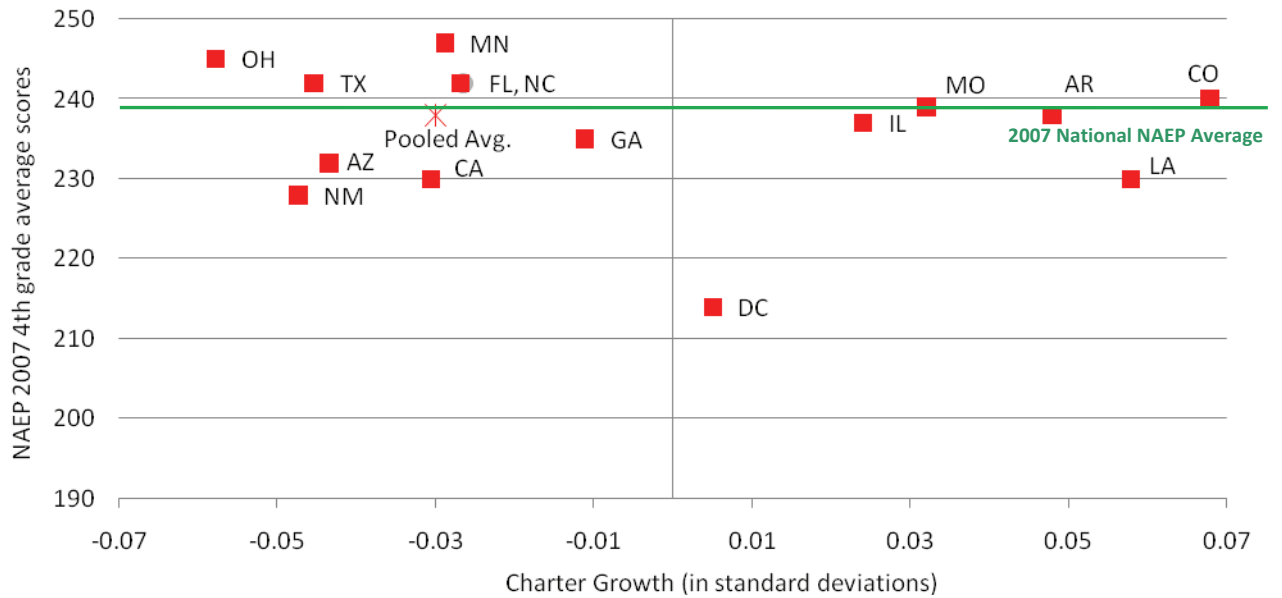
- The academic success of charter school students was found to be affected by the contours of the charter policies under which their schools operate.
- States that have limits on the number of charter schools permitted to operate, known as caps, realize significantly lower academic growth than states without caps, around .03 standard deviations.
- States that empower multiple entities to act as charter school authorizers realize significantly lower growth in academic learning in their students, on the order of -.08 standard deviations. While more research is needed into the causal mechanism, it appears that charter school operators are able to identify and choose the more permissive entity to provide them oversight.
- Where state charter legislation provides an avenue for appeals of adverse decisions on applications or renewals, students realize a small but significant gain in learning, about .02 standard deviations.

To put variation in state results in context, the average charter school gains in reading and math were plotted against the 2007 4<sup>th</sup> Grade NAEP state averages. The position of the states relative to the national NAEP average and relative to average learning gains tees up important questions about school quality in general and charter school quality specifically.

### Charter Growth Compared to 2007 NAEP State by State – Reading



### Charter Growth Compared to 2007 NAEP Score by State – Math



The analysis of total charter school effects, pooled student-level data from all of the participating states and examined the aggregate effect of charter schools on student learning. The national pooled analysis of charter school impacts showed the following results:

- Charter school students on average see a decrease in their academic growth in reading of .01 standard deviations compared to their traditional school peers. In math, their learning lags by .03 standard deviations on average. While the magnitude of these effects is small, they are both statistically significant.
- The effects for charter school students are consistent across the spectrum of starting positions. In reading, charter school learning gains are smaller for all students but those whose starting scores are in the lowest or highest deciles. For math, the effect is consistent across the entire range.
- Charter students in elementary and middle school grades have significantly higher rates of learning than their peers in traditional public schools, but students in charter high schools and charter multi-level schools have significantly worse results.
- Charter schools have different impacts on students based on their family backgrounds. For Blacks and Hispanics, their learning gains are significantly worse than that of their traditional school twins. However, charter schools are found to have better academic growth results for students in poverty.

English Language Learners realize significantly better learning gains in charter schools. Students in Special Education programs have about the same outcomes.

- Students do better in charter schools over time. First year charter students on average experience a decline in learning, which may reflect a combination of mobility effects and the experience of a charter school in its early years. Second and third years in charter schools see a significant reversal to positive gains.

## **POLICY IMPLICATIONS**

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As of 2009, more than 4700 charter schools enroll over 1.4 million children in 40 states and the District of Columbia. The ranks of charters grow by hundreds each year. Even so, more than 365,000 names linger on charter school wait lists.<sup>1</sup> After more than fifteen years, there is no doubt that both supply and demand in the charter sector are strong.

In some ways, however, charter schools are just beginning to come into their own. Charter schools have become a rallying cry for education reformers across the country, with every expectation that they will continue to figure prominently in national educational strategy in the months and years to come. And yet, this study reveals in unmistakable terms that, in the aggregate, charter students are not faring as well as their TPS counterparts. Further, tremendous variation in academic quality among charters is the norm, not the exception. The problem of quality is the most pressing issue that charter schools and their supporters face.

The study findings reported here give the first wide-angle view of the charter school landscape in the United States. It is the first time a sufficiently large body of student-level data has been

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<sup>1</sup> National Alliance for Public Charter Schools As of June 3, 2009:  
<http://www.publiccharters.org/aboutschools/benefits>

compiled to create findings that could be considered "national" in scope. More important, they provide a broad common yardstick to support on-going conversations about quality and performance. For the first time, the dialog about charter school quality can be married to empirical evidence about performance. Further development of performance measures in forums like the Building Charter School Quality initiative could be greatly enhanced with complementary multi-state analysis such as this first report.

It is important to note that the news for charter schools has some encouraging facets. In our nationally pooled sample, two subgroups fare better in charters than in the traditional system: students in poverty and ELL students. This is no small feat. In these cases, our numbers indicate that charter students who fall into these categories are outperforming their TPS counterparts in both reading and math. These populations, then, have clearly been well served by the introduction of charters into the education landscape. These findings are particularly heartening for the charter advocates who target the most challenging educational populations or strive to improve education options in the most difficult communities. Charter schools that are organized around a mission to teach the most economically disadvantaged students in particular seem to have developed expertise in serving these communities. We applaud their efforts, and recommend that schools or school models demonstrating success be further studied with an eye toward the notoriously difficult process of replication. Further, even for student subgroups in charters that had aggregate learning gains lagging behind their TPS peers, the analysis revealed charter schools in at least one state that demonstrated positive academic growth relative to TPS peers. These higher performers also have lessons to share that could improve the performance of the larger community of charters schools.

The flip-side of this insight should not be ignored either. Students not in poverty and students who are not English language learners on average do notably worse than the same students who remain in the traditional public school system. Additional work is needed to determine the reasons underlying this phenomenon. Perhaps these students are "off-mission" in the schools they attend. Perhaps they are left behind in otherwise high-performing charter schools, or perhaps these findings are a reflection of a large pool of generally underperforming schools. Whatever the reason, the policy community needs to be aware of this dichotomy, and greater attention should be paid to the large number of students not being well served in charter schools.

In addition, we know now that first year charter students suffer a sharp decline in academic growth. Equipped with this knowledge, charter school operators can perhaps take appropriate steps to mitigate or reverse this "first year effect."

Despite promising results in a number of states and within certain subgroups, the overall findings of this report indicate a disturbing — and far-reaching — subset of poorly performing charter schools. If the charter school movement is to flourish, or indeed to deliver on promises made by proponents, a deliberate and sustained effort to increase the proportion of high quality schools is essential. The replication of successful school models is one important element of this effort. On the other side of the equation, however, authorizers must be willing and able to fulfill their end of the original charter school bargain: accountability in exchange for flexibility. When schools consistently fail, they should be closed.

Though simple in formulation, this task has proven to be extremely difficult in practice. Simply put, neither market mechanisms nor regulatory oversight been a sufficient force to deal with

underperforming schools. At present there appears to be an authorizing crisis in the charter school sector. For a number of reasons — many of them understandable — authorizers find it difficult to close poorly performing schools. Despite low test scores, failing charter schools often have powerful and persuasive supporters in their communities who feel strongly that shutting down *this* school does not serve the best interests of currently enrolled students. Evidence of financial insolvency or corrupt governance structure, less easy to dispute or defend, is much more likely to lead to school closures than poor academic performance. And yet, as this report demonstrates, the apparent reluctance of authorizers to close underperforming charters ultimately reflects poorly on charter schools as a whole. More importantly, it hurts students.

Charter schools are already expected to maintain transparency with regard to their operations and academic records, giving authorizers full access. We propose that authorizers be expected to do the same. True accountability demands that the public know the status of each school in an authorizer's portfolio, and that we be able to gauge authorizer performance just as authorizers currently gauge charter performance. To this end, we suggest the adoption of a national set of performance metrics, collected uniformly by all authorizers in order to provide a common base line by which we can compare the performance of charter schools and actions of authorizers across state lines. Using these metrics, Authorizer Report Cards would provide full transparency and put pressure on authorizers to act in clear cases of failure.

The charter school movement to date has concentrated its formidable resources and energy on removing barriers to charter school entry into the market. It is time to concentrate equally on removing the barriers to exit.

# I. INTRODUCTION

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With over 4700 schools operating in 40 states and the District of Columbia, charter schools are the largest vehicle for school choice in US public education today. Since their arrival on the landscape in 1991, charter schools have operated in a heavily layered context of policies and expectations. They are at once educators, innovators, entrepreneurs, reformers and agents of community change. Despite their heterogeneity, they share a common footing in their separateness — an intentional move to juxtapose charter schools with traditional schools. Their different operating parameters are claimed not only to deliver quality education to students but also to produce other outcomes as a by-product: opportunities for parental choice, new approaches to curriculum and instruction and competitive pressure on existing school systems.

Charter schools and their performance play an increasingly central role in the education agenda in the United States. The need for US school reform has never been so widely recognized. Never have the economic, political and social pressures for improving education outcomes for students been so concentrated and aligned. The current political climate intensifies the pressure and scrutiny that charter schools face. The campaign promises of Barack Obama to enhance funding for charter schools have been translated into statements by Education Secretary Arne Duncan that charters will feature prominently in reform policies. Charter schools are expected to have an important role in the education funding priorities of the American Reconstruction and Recovery Act. If the right factors align, we could see a perfect storm of political and economic circumstance leading to a new era in charter school policy. Yet after one and a half decades of charter school experience, the body of evidence on charter school performance, though growing, remains thin.

This report presents the first results of a national analysis of charter school impacts on student achievement. CREDO at Stanford University and our partnering state education departments have collaborated to use statewide, student-level data to conduct in-depth analyses of academic outcomes for both charter school and traditional school students. Our state partners include: Arkansas, Arizona, California, Colorado (Denver), the District of Columbia, Florida, Georgia, Illinois (Chicago), Louisiana, Massachusetts, Minnesota, Missouri, New Mexico, North Carolina, Ohio and Texas.<sup>2</sup> Together, these states educate over one half of the K-12 students in the United States and more than 70 percent of the nation’s charter school students.

This analysis shows that in the aggregate charter schools are not advancing the learning gains of their students as much as traditional public schools. The results are significant in both reading and math, though the effects are small in size. The national pooled results show that charter students improve the learning gains of students in poverty and among English Language Learners compared to their peers in traditional public schools. Charter students who are Black or Hispanic experience lower levels of academic growth than their peers in traditional public schools. Special education students fare about the same. The results vary strongly by state and are shown to be influenced in significant ways by several characteristics of state charter school policies.

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<sup>2</sup> Analysis only includes charter schools in Denver Public Schools for Colorado and Chicago Public Schools for Illinois.

Two shifts in state education policies have presented new opportunities to study charter schools and their educational and system effects. The first is the adoption of annual achievement tests in reading and math for grades 3 – 8, providing a common set of performance measures for all students in each state. Putting the limitations of such tests aside, they are invaluable from a policy evaluation standpoint. The second change is the assignment of unique student identifiers that permit students’ experience over time to be measured and evaluated. Given this newfound ability to follow students over their education careers and compare their performance on a standardized basis, a number of research questions become viable for the first time.

We recognize that many factors influence the choice of schools: curricular focus, geographic location, size, safety and school culture are often cited as considerations. By choosing to examine student learning gains, we leave other factors unexplored, and are therefore unable to reflect how overall academic performance might be traded off against any other features of charter schools. The aim in this study is to provide detailed insight into one area – arguably the most important area – of charter school impacts on student outcomes.

This study includes a number of significant “firsts”. It is the first time so many states have joined together to pursue a common research design. Many states with large charter school populations are members of the partnership, so the snapshot of charter school experience is broader than in prior research. Many of the states that agreed to share data for this study have not been represented in longitudinal analyses before, so the pool of students is expanded in important ways.<sup>3</sup> Including multiple states’ data in the study allows light to be shed on state-to-state differences in charter school policies in a novel way. Third, the data on students is current as of the 2007 – 2008 school year, providing updates on a number of earlier studies.<sup>4</sup> The study design also incorporates a new method to compare the educational achievement and academic growth results of charter school students to equivalent students in schools that the students used to attend prior to enrolling in charter schools. This innovation produces a level head-to-head assessment of the performance of charter schools, something that has challenged the usefulness of several earlier studies.

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<sup>3</sup> National Alliance of Public Charter Schools. Charter School Achievement: What We Know, 5<sup>th</sup> Edition. April, 2009.  
[http://www.publiccharters.org/files/publications/Summary%20of%20Achievement%20Studies%20Fifth%20Edition%202009\\_Final.pdf](http://www.publiccharters.org/files/publications/Summary%20of%20Achievement%20Studies%20Fifth%20Edition%202009_Final.pdf)

<sup>4</sup> Teasley, Bettie. (2009). Charter school outcomes .In Berends, Mark, Matthew G. Springer, Dale Ballou, and Herbert J. Walberg (Eds.). *Handbook of research on school choice*. Taylor & Francis, Inc. pp. 209-225

We use data through the 2007 – 2008 school year in all states where it was available at the time of the study. In Massachusetts, North Carolina and Texas, student-level data was only available through the 2006 – 2007 school year.



This report is the first of three to be released in 2009 by CREDO studying the impact of charter schools. In this first report, we examine the effect of charter schools on the learning of the students they enroll. Here, we present the composite national picture of charter school performance; separate reports on the performance of charters for each state have been prepared and are posted on the CREDO website at <http://credo.stanford.edu>. The first report also presents a separate examination of the effect of policy on school effectiveness. The second report will examine the influence of operational characteristics of charter schools on their performance. The third and final report will examine the effect of charter schools on other schools in their immediate surroundings.

This report presents the results of our analysis of five questions. They are:

1. What is the overall impact of charter schools?
2. Do the impacts of charter schools differ by school type?
3. What are the impacts of charter schools for different student subgroups?
4. Does longer enrollment in charter schools affect student learning?
5. What are the impacts of charter school policies on student results?



### III. STUDY APPROACH

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This study of charter school performance attempts to advance our knowledge of charter school effectiveness on two related fronts. The first is to begin to consolidate student-level data from a variety of states in such a way that it can be submitted to a common analytic approach. The second is to create a study design that provides a fair and reliable comparison of student achievement between charter school students and students in traditional public schools. Each is discussed briefly below; greater detail is provided in the Technical Appendix to this report which can be found at <http://credo.stanford.edu>.

#### **CONSOLIDATING STUDENT DATA FROM MULTIPLE STATES**

Our study approach provides consistent analyses across states, which up to this point has not been a common occurrence. Recently, a study completed by researchers at RAND Corporation attempted to simultaneously study charter school effects in multiple states.<sup>5</sup> A common methodology with parallel data from many states removes one common topic of debate concerning the results, as was done in the RAND study. Studying the same effects in the same way puts all the participating states on a common footing, which is valuable for comparative purposes. This study extends the RAND methodology by creating a pooled dataset and estimating a national effect of charter schools on student academic growth.

This study also starts to create an aggregate picture of performance, which is useful as a wide-angle snapshot of the state of charter schools in 2009. The states included in this study enroll more than half the charter school students in the United States, so the consolidated results begin, for the first time, to tell the story of the policy of charter schooling at a macro level.

Consolidating experience across states is not without its challenges. As noted by the Charter School Achievement Consensus Panel in 2006, states vary in important ways in their treatment and support of charters. In recognition of this fact, our study seeks to examine common elements of charter school performance while simultaneously recognizing that states may play a role in how these schools perform. Others have suggested that state accountability tests differ, such that scores on a grade-level test in one state may not align with similar scores in another. Our study design circumvents these potential difficulties by standardizing test results from each participating state. Minor differences may remain after these adjustments, but their influence will be small compared to the predominant degree of overlap that exists among the tests.

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<sup>5</sup> Zimmer, Ron, Brian Gill, Kevin Booker, Stephane Lavertu, Tim R. Sass, John Witte. Charter Schools in Eight States: Effects on Achievement, Attainment, Integration, and Competition. RAND Corporation. As of June 2, 2009: <http://www.rand.org/pubs/monographs/MG869/>.

On a practical note, this study required an approach that meets the multiple and conflicting interpretations across states of the Family Education Records Privacy Act (FERPA). The only realistic avenue to conduct a study of this scope is to negotiate agreements with state education agencies for permission to use administrative datasets with student-level records. In spite of changes to the implementation regulations in late 2008, the law remains unclear about the permissibility of providing independent researchers access to student-level data. Several accommodations were imposed as conditions of agreement — though curiously, each was imposed by only one state. For example, even after all identifying information was removed, one state declined to provide gender on the theory that it prevented identification of individual students. Lacking that information in one state meant that this variable could not be included in the pooled model for any state, so this study is unable to control for gender effects.

### **FAIR ANALYSIS OF IMPACTS ON STUDENT ACADEMIC PROGRESS**

Researchers today generally agree that tests of school effectiveness need to be based on value-added analysis. Since students can differ in many respects, including their starting score on standardized tests, the fairest analysis examines what increment of growth a school contributes once a variety of individual factors are taken into consideration. This study follows that approach: we look at student achievement growth on state achievement tests in both reading and math after imposing controls for student demographics and eligibility for categorical program support such as free or reduced-price lunch and special education.

This study takes additional steps to ensure that charter school students are examined under conditions that are both strict and fair. There are competing frictions in a study like this that researchers must work to balance. One is the chance that charter school students are different than TPS students in ways that are not obvious or measurable. The most common claim is that there is a risk of selection bias — that is, that students enrolled in charter schools are not comparable to their TPS peers. This could be the result of their parent’s decision to utilize their choice of schools, and whatever unobserved characteristics for which this choice may serve as a proxy.

One common approach to minimize the risk of selection bias is the use schools that employ random lotteries for admission. This approach, which narrows the analysis to only those students whose parents put them on a lottery list for charter schools, does mitigate much of the impact on student learning associated with the exercise of school choice.<sup>6</sup> However, by limiting the analysis to only students at oversubscribed charter schools, this cohort of both schools and students may not be reflective of the general charter school population.

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<sup>6</sup> Hoxby, Caroline M. and Sonali Murarka. “New York City’s Charter Schools Overall Report”, Cambridge, MA: New York City Charter Schools Evaluation Project, June 2007.

A second and increasingly common approach to mitigate the impact of selection bias is the use of student fixed effects. Despite their potential to provide a purer signal of charter school effect, we reject this approach for multiple reasons. First, student fixed effects only control for the unobserved characteristics of students that do not change over time. Second, we feel that there is much value in our “wide angle” view, utilizing the individual data of hundreds of thousands of students across fifteen states and the District of Columbia. The use of student fixed effects would limit our analysis to only those students that moved from TPS to charter schools (or vice-versa), significantly reducing both the universality and external validity of our results.

Even if one accepts the presence of selection bias, the process by which we select students for comparison likely works to mitigate its impact. By only comparing students from the same “feeder schools,” that is, the TPS previously attended by the students at a particular charter, we reduce the risk of information asymmetry with respect to charter school knowledge, among other potential sources of bias. In other words, by predominantly selecting charter and TPS students for comparison who previously attended the same pool of schools, we also eliminate a significant portion of the selection bias, at least as it relates to local charter school knowledge and other neighborhood effects. For communities in which charters exist, recent polling shows a majority of citizens and parents are sufficiently informed about charter schools to express an opinion, suggesting consistent penetration with respect to charter school familiarity.<sup>7</sup>

Further, the presumption of a positive selection bias may be speculative for other reasons. It implies that parents of TPS students do not themselves exercise choice as to where their students attend school. While the proportion of “choosers” to “non-choosers” among TPS parents is unknown, the notion of an entirely passive parental population in TPS schools seems inappropriate. In the absence of hard data, the best estimate is that the two groups are evenly split.

Our challenge is to create a comparison population that reduces as much as possible the differences between charter school students and TPS students apart from differences in their enrollment. To do that, we create “virtual twins” for each of the charter school students in our study. Further steps to eliminate differences between the two groups are pursued in the course of statistical modeling.

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<sup>7</sup> OnMessage, Inc. Polling results from 2008 and 2009 household surveys in four urban communities show that in each locale over 60 percent of general citizens have opinions about charter schools; for parents of school aged children, the proportions are higher. Email correspondence with Rick Heyn of OnMessage, June 3, 2009.

## **SELECTION OF COMPARISON OBSERVATIONS**

To create a reliable comparison group for our study, we attempted to build a Virtual Control Record (VCR) for each charter school student. The VCR approach builds on work from Harvard University and work done independently by the Northwest Evaluation Association (NWEA).<sup>8</sup> Both groups have explored the use of synthetic control groups in comparative research. This technique creates an aggregate record by drawing on the available records that match with the record of interest, in this case a charter school student. The Harvard approach weights each potential control record in terms of how closely the record matches the profile, while NWEA sets the condition of a successful match in advance so that only “true” or “near true” records are selected.

CREDO’s methodology parallels that of NWEA. Our approach is displayed in Figure 1. We identify all the TPS that have students who transfer to a given charter school; we call each of these schools “feeder schools.” Once a school qualifies as a feeder school, all the students in the school become potential matches for a student in a particular charter school. All the student records from all the feeder schools are pooled – this becomes the source of records for creating the virtual match. Using the records of the students in those schools in the year *prior* to the test year of interest, CREDO selects all of the available records that match each charter school student.

Match factors include:

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

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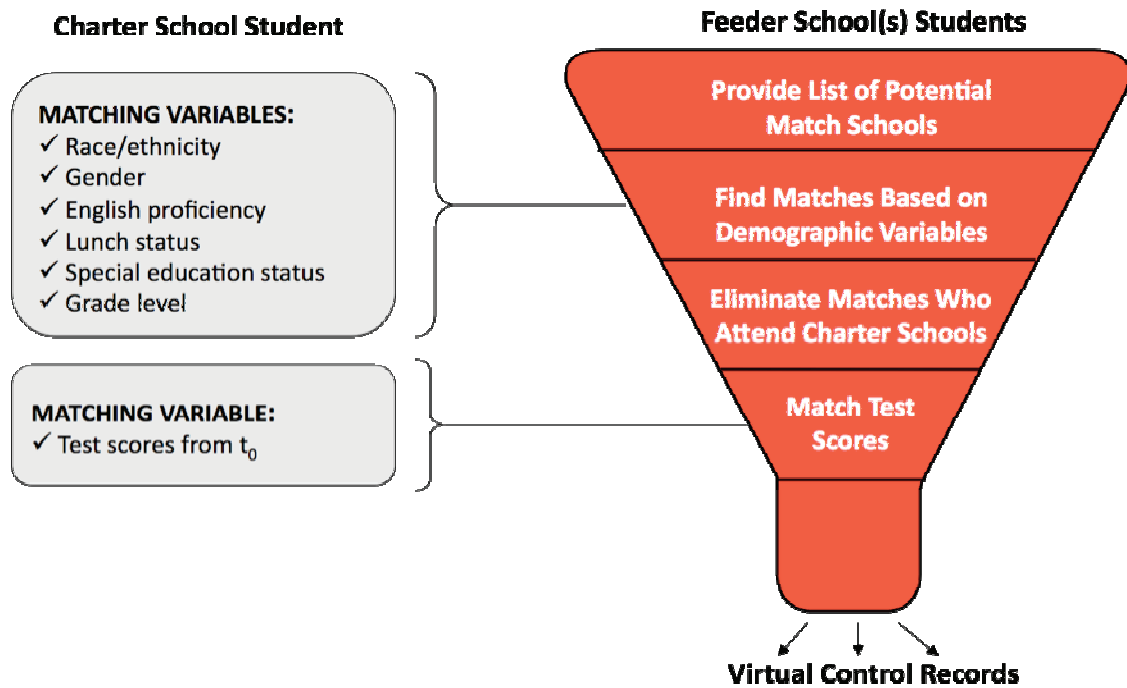
<sup>8</sup> Abadie, Alberto, Alexis Diamond and Jens Hainmueller. (2006) Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California’s Tobacco Control Program. Harvard University. Working Paper. As of June 2, 2009: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=958483](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=958483)

Northwest Evaluation Association. *Why is the Growth Research Database Significant?* As of June 2, 2009: <http://www.nwea.org/support/details.aspx?content=1053>

Berends, Mark, Caroline Watral, Bettie Teasley and Anna Nicotera. Charter School Effects on Achievement. in Berends, Springer, Walberg (Eds.) Charter School Outcomes. New York: Lawrence Erlbaum Associates, 2009, p. 260.

<sup>9</sup> Gender is used as a match factor in all states except Florida.

Figure 1: CREDO VCR Methodology



The scores from the test year of interest are then averaged and a Virtual Control Record is produced. That record is completely masked, because there is no trace of from which specific school the contributing records originated. The VCR produces a score for the test year of interest that corresponds to the expected value results of matching techniques used in other studies, such as propensity matching. The results of our match process appear in Table 1.

**Table 1: Percent of Charter School Students with Matches**

	<b>Reading</b>	<b>Math</b>
Pooled Average	83.7%	84.4%
Arizona	82.1 %	81.0%
Arkansas	88.3 %	87.3%
California	77.0 %	81.3%
Colorado (Denver)	73.8 %	78.4%
District of Columbia	86.3 %	84.8%
Florida	93.2 %	93.1%
Georgia	93.5 %	92.8%
Illinois (Chicago)	92.2 %	92.4%
Louisiana	84.6 %	84.7%
Minnesota	70.3 %	70.6%
Missouri	80.9 %	79.0%
New Mexico	76.1 %	75.2%
North Carolina	81.9 %	75.7%
Ohio	75.0 %	75.6%
Texas	86.3 %	89.0%

VCRs are re-examined in every subsequent test period to ensure that the conditions of match still apply — namely that the students included in the VCR record are still enrolled in traditional public schools and have not left the state. Where the conditions are violated, the VCR is reconstructed to delete the disqualified student records. What results are matched pairs that are followed over as many years as are supported by available data.

A number of things can contribute to a charter school student not finding a match. Students who are new to a community and have no prior history will not be matched for the first year. For some students, all the initial matches are invalidated in subsequent time periods due to school changes among the TPS students. The tight limits that are placed on starting scores also create a hindrance to matches: by ensuring that our students are close together in starting point, we end up narrowing the field of possible matches.

Our goal is to create a virtual twin study where all pairs of students are mirror images save for the fact that they are schooled in different places. By combining the exact observed characteristics of the charter twin and averaging all the unobserved characteristics of the TPS contributors to the virtual TPS twin, the differences between the two are minimized to a greater degree than is currently available with other techniques. A profile of the resulting student-level database is presented in Table 2.



**Table 2: Demographic Profile of Charter School Students Included in Model**

	<b>% Black</b>	<b>% Hispanic</b>	<b>% Special Education</b>	<b>% English Language Learners</b>	<b>% Free / Reduced Lunch</b>
Pooled Average	26.6%	30.4%	7.0%	6.5%	48.6%
Arizona	4.8 %	29.6 %	11.3 %	11.3 %	49.0 %
Arkansas	55.9 %	1.6 %	8.8 %	0.2 %	60.3 %
California	10.3 %	42.9 %	4.1 %	14.8 %	44.4 %
Colorado (Denver)	30.6 %	54.3 %	5.4 %	10.8 %	67.0 %
District of Columbia	93.5 %	4.4 %	12.1 %	1.8 %	71.6 %
Florida	24.9 %	28.3 %	9.9 %	2.2 %	39.0 %
Georgia	50.6 %	9.1 %	10.0 %	3.3 %	50.6 %
Illinois (Chicago)	73.1 %	24.6 %	11.1 %	0.5 %	90.6 %
Louisiana	76.7 %	1.0 %	4.3 %	0.7 %	65.4 %
Minnesota	21.3 %	3.9 %	8.9 %	12.5 %	45.6 %
Missouri	90.8 %	4.1 %	7.3 %	2.4 %	72.2 %
New Mexico	1.7 %	60.0 %	8.2 %	6.7 %	48.4 %
North Carolina	30.5 %	1.7 %	5.8 %	0.4 %	23.4 %
Ohio	61.0 %	1.5 %	11.6 %	0.5 %	70.8 %
Texas	25.1 %	54.7 %	1.5 %	4.2 %	65.0 %

Included in Table 3 below, we computed the starting values of students based on a standardized test score for their baseline year in the study. Their score was 0 if they scored at the state average on the achievement test for that year and subject. Negative scores indicate their score was below the state average (with a -1 showing they were one standard deviation below the state average) and positive if their score was above.

The values in Table 3 clearly show that charter schools draw from different parts of their state’s distribution of students.

**Table 3: Charter School Student Starting Values**

	<b>Reading</b>	<b>Math</b>
Pooled Average	0.00	-0.05
Arizona	0.15	0.06
Arkansas	-0.10	-0.23
California	0.11	0.05
Colorado (Denver)	-0.37	-0.47
District of Columbia	0.11	0.12
Florida	0.05	0.04
Georgia	-0.14	0.02
Illinois (Chicago)	-0.33	-0.39
Louisiana	-0.04	-0.07
Minnesota	-0.14	-0.16
Missouri	-0.56	-0.65
New Mexico	0.10	0.02
North Carolina	0.19	0.10
Ohio	-0.41	-0.54
Texas	-0.17	-0.32

Students drawn from the same school may be subject to common influences, so the analysis of school impacts must consider this when evaluating the contribution of schools. Accordingly, we use the more stringent thresholds for statistical tests in the analyses that are presented, known as robust standard errors.

## IV. CHARTER SCHOOL EFFECTS ON STUDENT LEARNING

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Over 1.7 million records from more than 2400 charter schools are included in the analysis. The estimates of charter school impacts on student learning are remarkably stable across different views. Our findings show that the effectiveness of charter schools varies widely across the country, differing across states and even within states. Consistent with other research, we find that however valid the “simple story” about the average effect of charter schools is, it masks more insightful but also more subtle results.

For our analysis, we relied on ordinary least squares (OLS) regression. Math and reading were analyzed separately. The dependent variable was the standardized growth score in either reading or math for each student. The basic model included controls for student characteristics – standardized starting score, race/ethnicity, special education and lunch program participation, English proficiency and repeating a grade.<sup>10</sup> Indicators for each state and for scores that were affected by Hurricane Katrina in August 2005 were also included. The basic model was adjusted by changing variables or by altering their form as we examined particular features of charter school performance.<sup>11</sup>

The student learning gains of charter students are compared to those for equivalent students in traditional public schools in three different ways. The results start with an analysis of charter schools in the aggregate to create comprehensive measures of effects on student learning. The national results are then disaggregated by state to illustrate the variation across states and to posit the influence of a number of policy factors in those state-specific results. The third analysis is done with further disaggregation to examine the results of charter schools against their specific community schools.

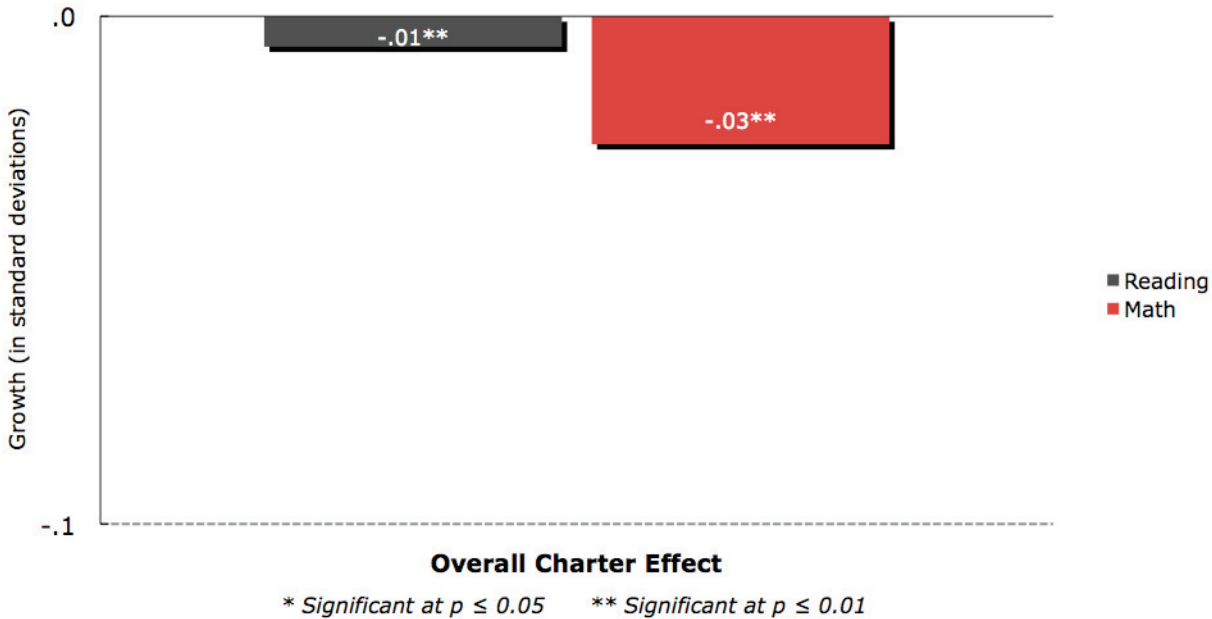
It is certainly tempting to examine the pooled effect of charter schools on student academic performance as a way of seeing, on average, “How are charters doing?” The national composite measures the average effectiveness of charter schools in creating learning gains compared to their TPS virtual twins. For this first model, we included a simple charter school indicator in our regression. Because the national composite pools all charter school student results and compares them to the results of all their virtual twins in TPS, it signals the composite effect at this point in time. In this respect, the national statistic functions much like the national averages that accompany the various National Assessment of Education Progress (NAEP) examinations.

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<sup>10</sup> We could not control for student gender in our models because it was not available for all states.

<sup>11</sup> The full set of results are presented in the Technical Appendix.

Figure 2: Overall Charter School Effect



In reading, charter students on average realize a growth in learning that is .01 standard deviations less than their TPS counterparts. This small difference — less than 1 percent of a standard deviation — is significant statistically, but is meaningless from a practical standpoint. Differences of the magnitude described here could arise simply from the measurement error in the state achievement tests that make up the growth score, so considerable caution is needed in the use of these results.

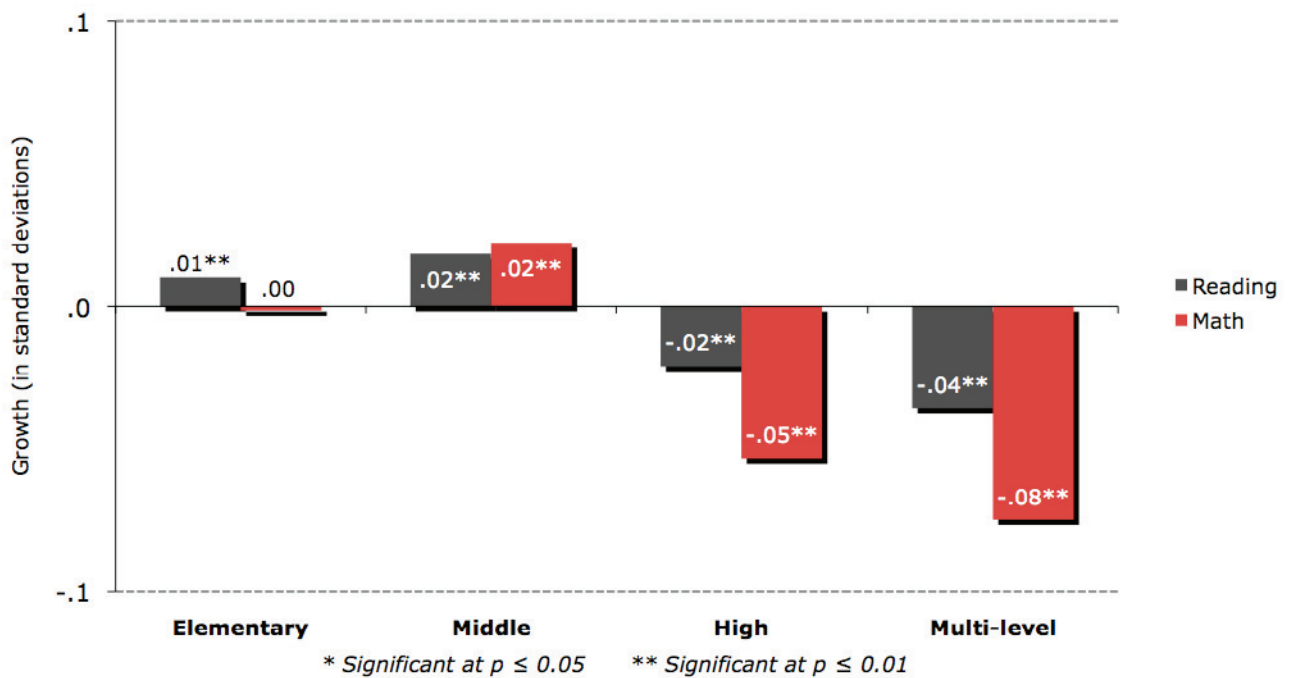
In math, the analysis shows that students in charter schools gain significantly less than their virtual twin. Charter students on average have learning gains that are .03 standard deviations smaller than their TPS peers. Unlike reading, the observed difference in average math gains is both significant and large enough to be meaningful. In both cases, however, the absolute size of the effect is small.

The national composites can be considered average measures at a particular point in time. They tell nothing about the shape of the underlying distribution of individual student gains. They are also silent about which underlying factors account for the results. These insights require more structured approaches.

## CHARTER SCHOOL EFFECT BY SCHOOL CHARACTERISTICS

Considerable interest in recent years has focused on the effectiveness of charter schools serving particular grade spans. Many of the circumstances charters face also apply to their competitor traditional public schools; however, the emphasis for charters is likely to be intensified as part of their reform mission. Charter elementary schools are scrutinized for their ability to attract and retain students on grade level early in their education experience. Charter middle schools face a mix of expectations. Since students can enter with a wide range of preparations, these schools are pressed to recover existing deficits, maintain momentum for students who are already doing well, and prepare all students for the rigors of secondary education and beyond. The pressures for charter high schools may be the most severe of all, including a wider potential range of student academic histories and the need to foster awareness and access to post-secondary options for their students. To see how the various grade spans of charter schools managed to meet their respective challenges, the overall charter school effect was disaggregated by grade span. Figure 3 presents the results.

**Figure 3: Charter School Effect by Grade Span**



The reading results for all the grade spans were found to be statistically significant. For elementary charters, students realize a small positive gain over their TPS peers of .01 standard deviations a year. The impact of charter middle schools is also positive, their students experiencing a .02 standard deviation increase in growth over their TPS peers. However, the effect for charter high schools and multi-level schools is negative compared to TPS students, with .02 and .04 standard deviation reductions in overall gain, respectively.<sup>12</sup>

For math, the performance of students in charter elementary schools was not different than for their twins in TPS. A more positive result was seen for students in charter middle school, whose average gains were .02 standard deviations larger than their comparison students. The reverse was found for charter high school students; their gains were -.05 standard deviations lower than was the case for TPS high school peers. Multi-level schools turn in the worst comparative performance, producing -.08 standard deviations lower gains than similar students in TPS.

## **CHARTER SCHOOL EFFECT BY STUDENT CHARACTERISTICS**

Although the national pooled model suggests that there is little difference on average between charter school effects and those of traditional public schools, additional analyses can investigate whether charters have better effects with some subsets of students.

For many charter school supporters, improving education outcomes for historically disadvantaged student groups is the paramount goal. Not only is it important to the futures of the students involved, but changing the learning trajectories for underserved students would also provide important evidence that successful results are feasible, widespread and within reach. If shown, it would establish new performance expectations for all schools, charter and TPS alike. In addition, the future economic well being of the country will be materially affected by the success or failure of minorities, students with initial language challenges and students in poverty.

To measure the effect of charter schooling on groups of students, we use a consistent standard of comparison for academic growth. In all of the analyses that follow, we compare the average growth of various student groups to the performance of an average TPS white student who is proficient in English, not receiving Special Education services and is not in poverty. This profile is the archetype for each of the achievement gap comparisons and serves the same purpose here. To do this, variables were created to indicate charter students within each student subgroup in lieu of a general charter school indicator. This was done for race/ethnicity variables as well as special education, English proficiency and lunch status indicators.

The bar graphs that follow show two comparisons simultaneously. The size and direction of each bar represents the average differences between the student subgroup and the archetypical average TPS student. Where appropriate, confidence levels for statistical significance are included. The second comparison looks at the differences between TPS and charter schools in how well they educate the same student subgroup. Where the bars for charter school results are shaded, it signifies a statistically significant difference in performance between charter and TPS students.

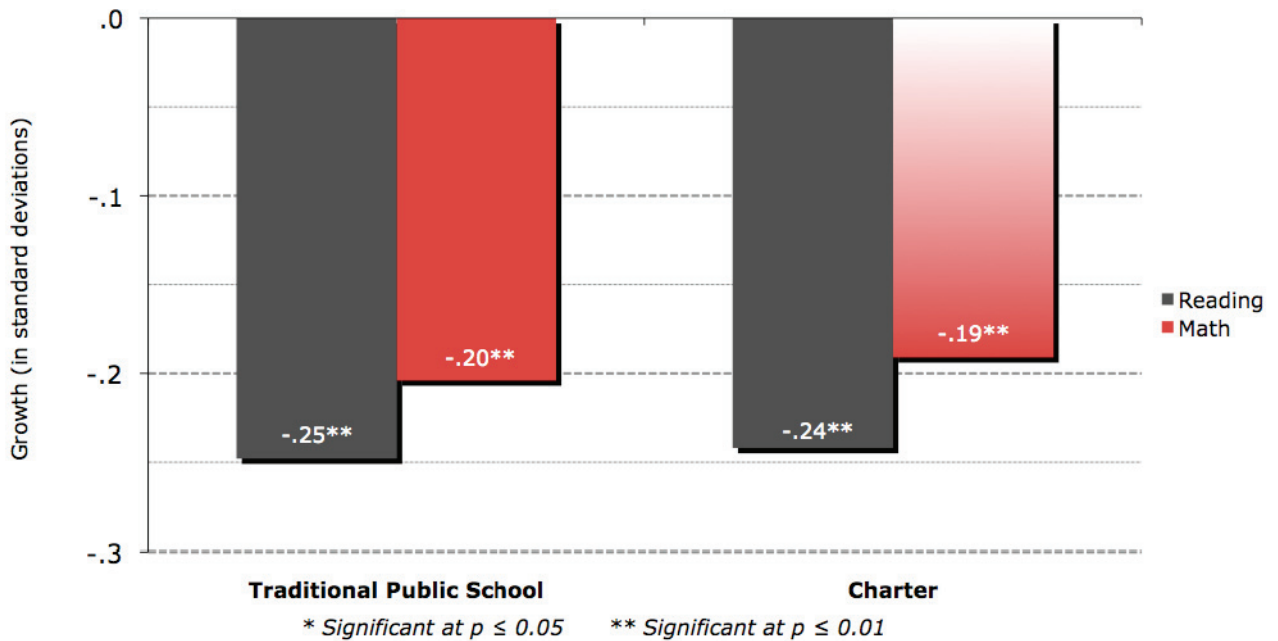
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<sup>12</sup> Multi-level schools represent a mixture of schools, some combining elementary/middle grades, others middle/high grades and still others offering K-12 grades.

Figures 4 through 7 present the comparisons of charter school student results to their TPS virtual twins. However, the aggregate picture of the pooled sample does not display the strong variation in effects that are seen if the results by student subgroups are examined at the state level. States differ widely in how well they serve various subgroups, as shown in the Tables 4 through 8. In these tables, where a state is not listed, the charter impact was not significant.

Charter school students with special education designations on average perform about as well in reading as similar students in TPS. Both have inferior gains compared to students who are not receiving Special Education services. Special Education students find significantly better outcomes for math relative to their twins in TPS.

**Figure 4: Charter School Effect on Special Education Students**



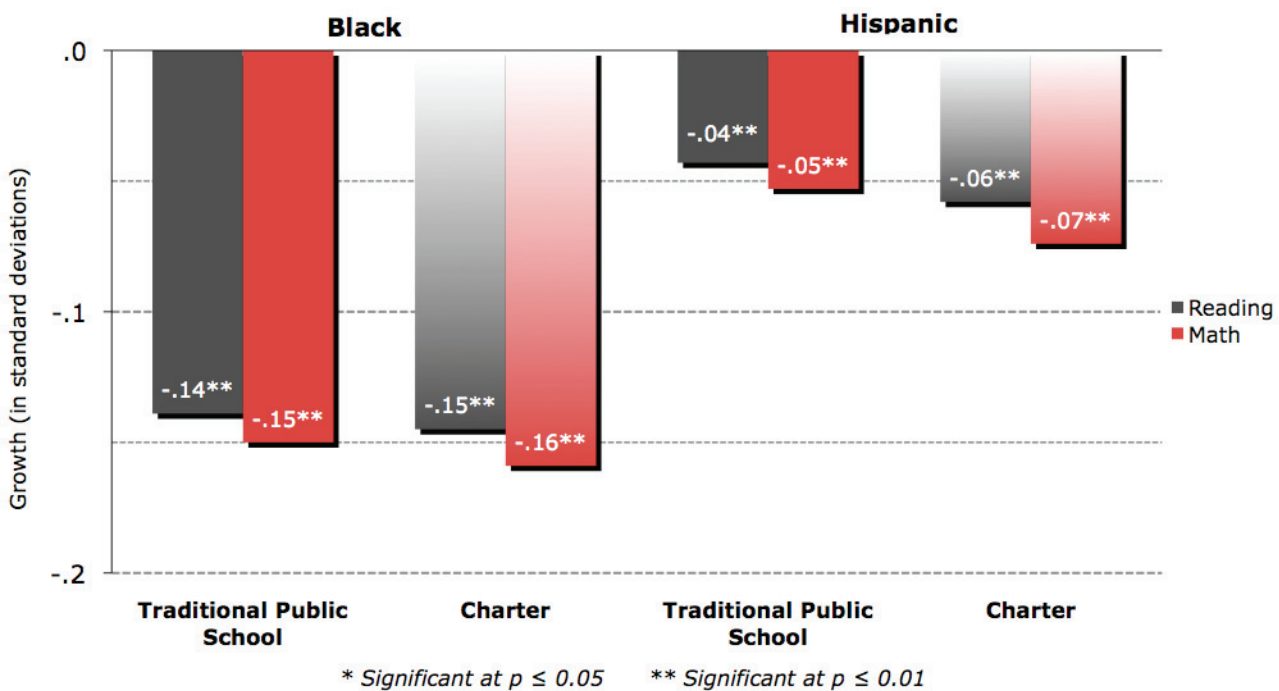
**Table 4: Summary of State-Specific Results, Charter Effect on Special Education Students**

Reading Growth		Math Growth	
Negative and Significant	Positive and Significant	Negative and Significant	Positive and Significant
			Arizona
			California

Special Education students who attend charter schools do not receive any significant impact in reading in any state included in this study compared to their TPS peers. However, Special Education students in charter schools do better in math in Arizona and California than their TPS peers.

Charter schools show distinctly different results for minority students. As shown in Figure 5, Black and Hispanic charter students do not fare as well in reading gains as their TPS peers. Both groups of minority students have significantly lower gains than their TPS comparison students. As with reading, Black and Hispanic students were seen to realize significantly lower learning gains in math.

**Figure 5: Charter School Effect on Black and Hispanic Students**



**Table 5: Summary of State-Specific Results, Charter Effect on Black Students**

Reading Growth		Math Growth	
Negative and Significant	Positive and Significant	Negative and Significant	Positive and Significant
Florida	California	Arizona	Arkansas
Georgia	Louisiana	Florida	Louisiana
Illinois	Minnesota	Georgia	Minnesota
Texas	Missouri	North Carolina	Missouri
		Texas	



Black charter school students do better compared to their TPS peers in both math and reading in Louisiana, Minnesota and Missouri. In addition, Black charter school students do better in reading in California and better in math in Arkansas than their TPS peers.

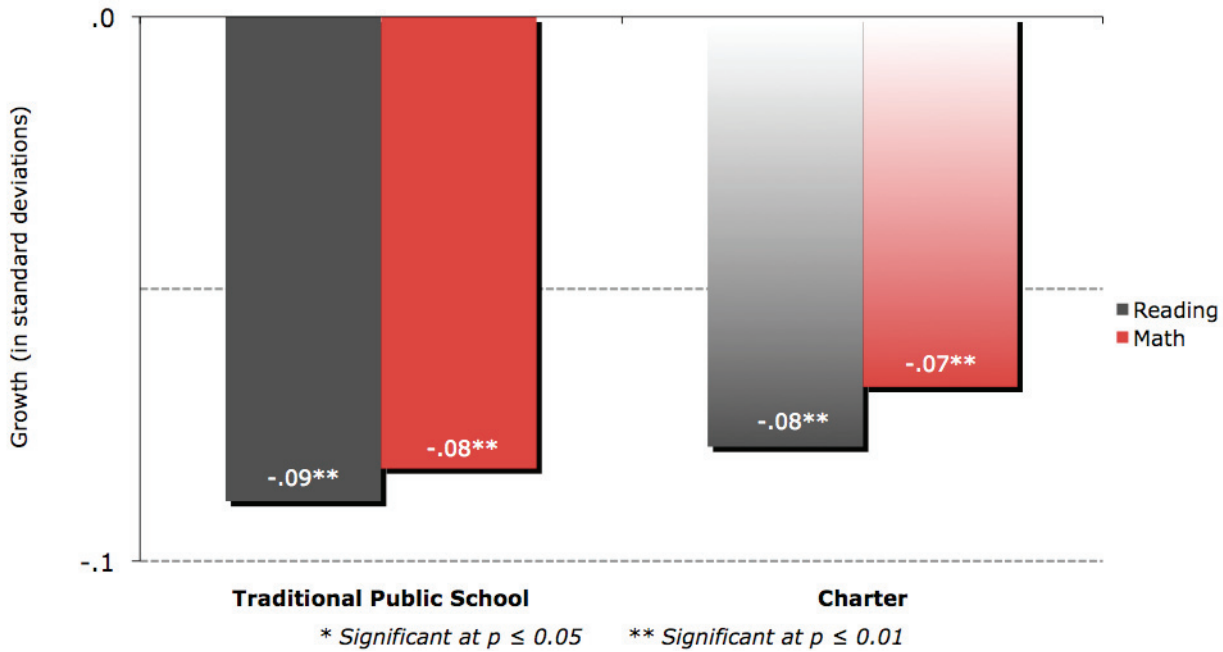
**Table 6: Summary of State-Specific Results,  
Charter Effect on Hispanic Students**

Reading Growth		Math Growth	
Negative and Significant	Positive and Significant	Negative and Significant	Positive and Significant
Georgia	Missouri	Arizona	Arkansas
Illinois		California	Colorado
New Mexico		Georgia	Louisiana
Ohio		Illinois	Missouri
Texas		New Mexico	
		Ohio	
		Texas	

Hispanic charter school students do better compared to their TPS peers in both math and reading in Missouri. In addition, Hispanic charter school students do better in math in Arkansas, Colorado and Louisiana than their TPS peers.

We see positive results for charter school students in poverty – these students realized statistically superior learning gains in reading compared to their TPS peers, as shown in Figure 6. The magnitude of the difference was about the same as was seen for the overall reading effect, .01 standard deviations, though here the sign is positive. While significant, the effect is small. The same relative outcome was realized in math learning gains; students in poverty who attended charter schools see superior results over their TPS counterparts.

**Figure 6: Charter School Effect on Students in Poverty**



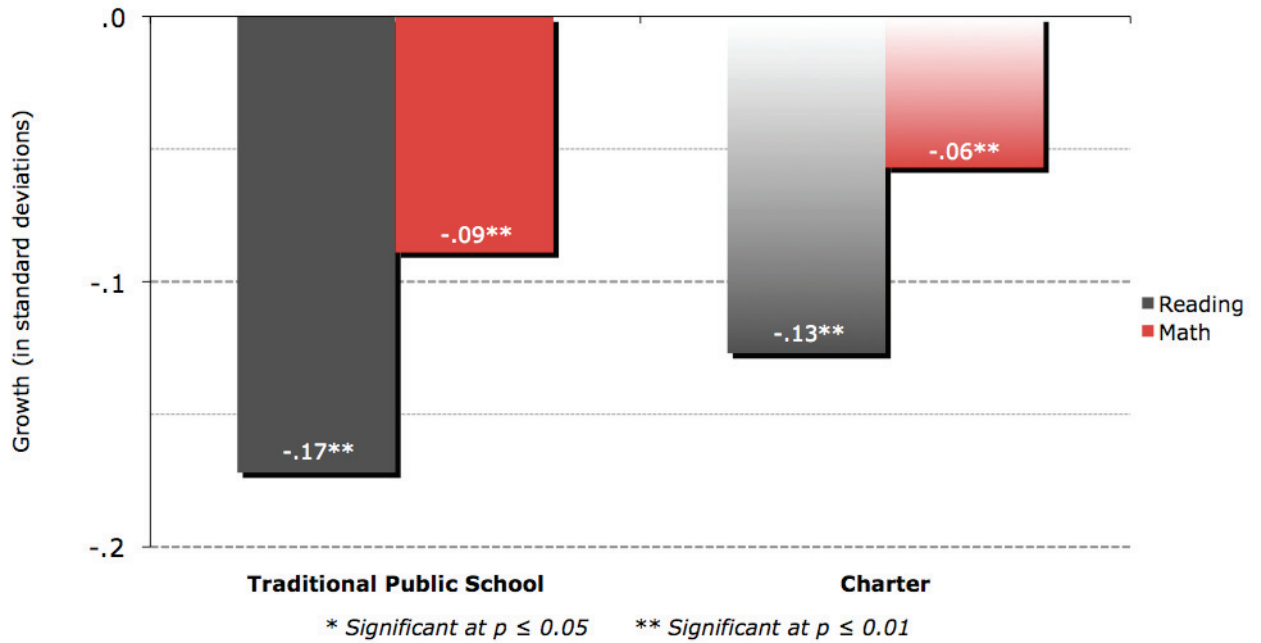
**Table 7: Summary of State-Specific Results, Charter Effect on Students in Poverty**

Reading Growth		Math Growth	
Negative and Significant	Positive and Significant	Negative and Significant	Positive and Significant
Louisiana	Arkansas	Arizona	Arkansas
Missouri	California	Louisiana	California
	Georgia	Missouri	Georgia
	Illinois		Illinois
	North Carolina		Ohio
	Ohio		Texas
	Texas		

Students in poverty that attend charter schools do better compared to their TPS peers in both math and reading in many states, including: Arkansas, California, Georgia, Illinois, Ohio and Texas. In addition, charter school students in poverty do better in reading in North Carolina than their TPS peers.

The analysis revealed a favorable set of outcomes for charter school students who are English Language Learners. For students with English language deficiencies, schooling in charter schools accelerated learning gains in reading by a significant amount. The same result was observed for math learning gains; charter school students had significantly higher gains than those obtained by similar TPS students.

**Figure 7: Charter School Effect on English Language Learners**



**Table 8: Summary of State-Specific Results, Charter Effect on English Language Learners**

Reading Growth		Math Growth	
Negative and Significant	Positive and Significant	Negative and Significant	Positive and Significant
	Arizona	Missouri	California
	California		Georgia
	New Mexico		
	Texas		

English Language Learners that attend charter schools do better compared to their TPS peers in both reading and math in California. In addition, English Language Learners in charter schools do better in reading in Arizona, New Mexico and Texas and better in math in Georgia.

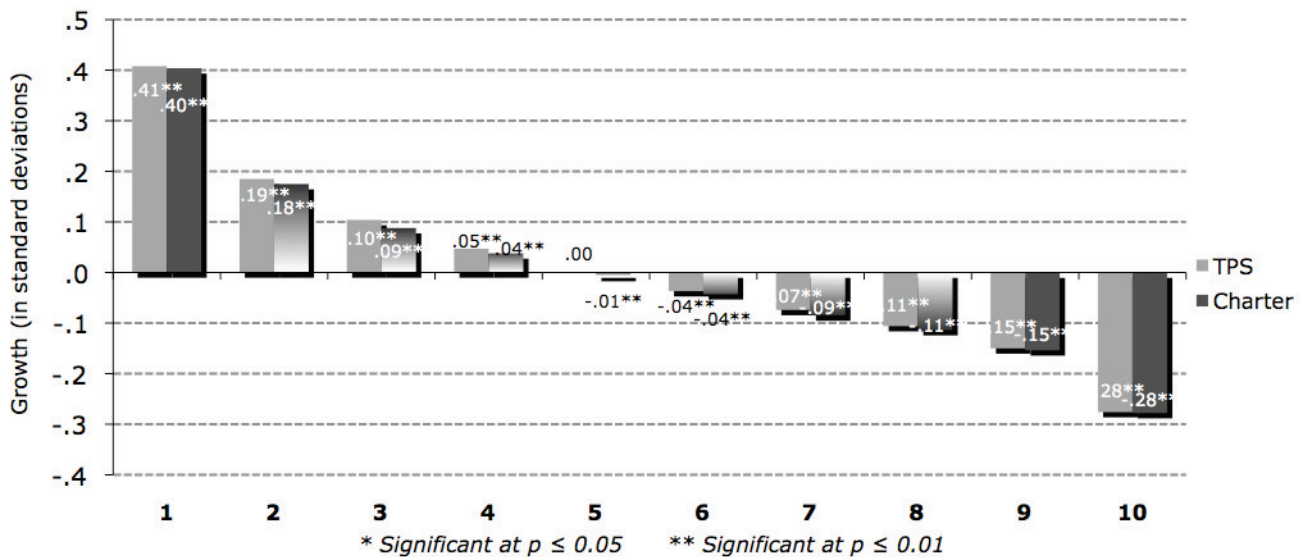
## CHARTER SCHOOL EFFECT BY STARTING DECILE

One way to decompose the charter school effect is to examine what contributions to student learning charter schools make across the spectrum of starting abilities. Given their mandate to have open enrollment policies, there is no telling what kind of student may enroll in a charter school; the schools must be capable of promoting learning gains in every student, regardless of starting point. The answer might usefully inform further policy discussions, if it were shown that charters have a better impact on students who start out in particular ranges of the performance spectrum.

The comparison is done by grouping students according to their initial scores on their baseline state achievement tests. The achievement tests for each state, year and subject are divided into deciles and the students' baseline scores are sorted accordingly. Students were then further divided into charter and TPS groups within each decile.<sup>13</sup>

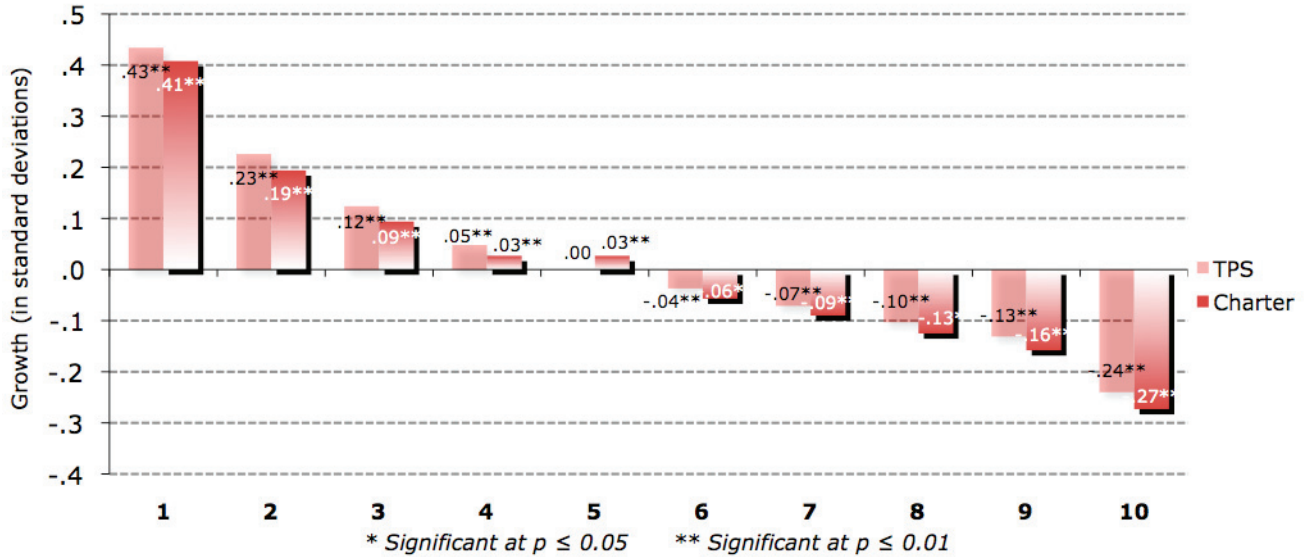
This computation does not reveal what the distribution of starting scores looks like – it only shows the range of growth for however many students are in each of the starting deciles. The average growth for charter school students in the same starting decile are then compared to equivalent growth for their TPS virtual twin. The results appear in Figures 8 and 9.

**Figure 8: Charter School Effect by Students' Starting Decile - Reading**



<sup>13</sup> The general charter school indicator was excluded from these models.

**Figure 9: Charter School Effect by Students' Starting Decile - Math**



For both reading and math, the results display the typical curve of declining positive growth as initial scores near the mean of the distribution and increasingly negative impacts as the starting scores move into more positive ranges. The pattern, referred to as regression to the mean, illustrates the effect of measurement error in the starting scores: students with extreme scores are more likely to have been influenced by unfavorable measurement error (which is also larger at the tails of the distribution) so that the following year, their results reflect both real growth and a more typical level of measurement error. Since the study design selects controls on the basis of starting scores, among other things, each charter-TPS pair faces the same probability of measurement error. Thus, the difference between the average charter school growth and TPS growth for each decile is the relevant comparison.

For reading, charter school students show significantly less growth than TPS students in deciles 2 – 8, and their growth is equivalent to that of their TPS peers starting out in the lowest and highest deciles. In math, the negative effect was pervasive across all deciles. In each starting decile, charter students achieved significantly less growth than their twins in TPS. While the magnitude of the difference varied slightly across the deciles, the negative effect was significant in all.

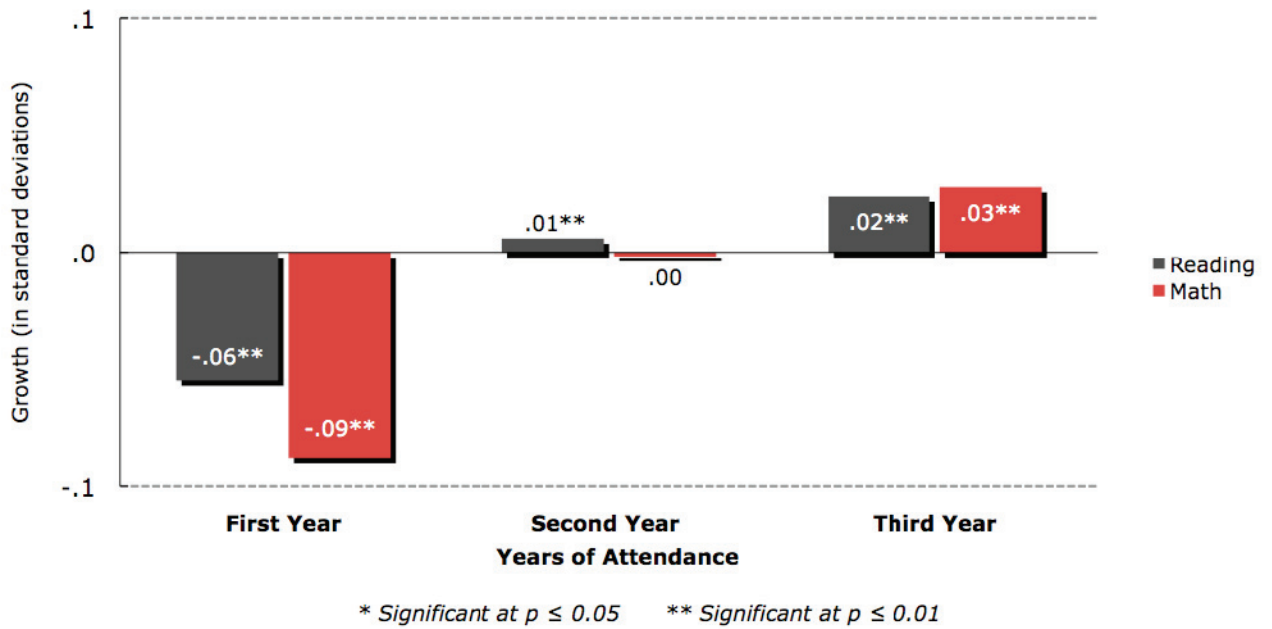
## **CHARTER SCHOOL EFFECT OVER TIME**

One of the possible explanations for the observed national results may be linked to the rapid growth of the charter school population each year and subsequent new school openings, leading to many of the charter students included in this study having been enrolled in their schools for only a few years. One wonders if students with more years of charter schooling might have different results compared to relative newcomers. In other words, we want to see if the effect that charter schools have on their students changes as they stay longer in charters. To study this, we limit our analysis to only those students who transfer into a charter from a public school during the course of our study. Then we again excluded the general charter school indicator in favor of including indicators for each year of attendance at a charter school.

The findings are presented in Figure 10. The overall charter school impact was disaggregated by the number of years a student had enrolled in a charter. (The first year of enrollment counts as one year.) As displayed in Figure 10, students generally experience a significant negative impact on learning in reading in their first year of charter enrollment, in the range of  $-.06$  standard deviations. By the second year of charter school enrollment, students get a positive and significant impact on learning, but the magnitude is quite small at  $.01$  standard deviations. Greater gains in reading are realized after three years; the average student with three years of charter schooling has a  $.02$  standard deviation gain in learning.

These results help us to further understand the overall pooled effects for charter schools. Because the number of students attending charter schools grows each year, the experience of charter school students reflected in each state's data is skewed toward first-year charter students. More than half of the records in this analysis capture the first year of charter school experience. Given the improvement trends shown in Figure 10, the overall charter school effects would be expected to improve if the same cohort were followed for additional years.

**Figure 10: Charter School Effect by Students' Years of Enrollment**



When looking at math learning gains the effects are more pronounced. Students in their first year of charter enrollment had gains that were -.09 standard deviations behind a typical TPS gain. The second year of enrollment produced no difference in the degree of learning gains. Mildly positive but significant impacts on learning gains are realized if a student remains in a charter school for three years or more, about .03 standard deviations in the third.





## V. CHARTER SCHOOL EFFECT BY STATE

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Across the country, the education environment in which charter schools exist differs significantly. There are differences among states in the level of political support for charters, differences in the degree of parity charter schools have with district schools and variation in the approach to K-12 education by the state education departments in each state more generally. In addition, the existing population characteristics and distribution within states may differ and ultimately be reflected in the profiles of the schools in our study.

The average differences in charter school performance across states can be isolated statistically through the use of state fixed effects. A dummy variable for each state is included in the models for student learning in reading and mathematics, so that each student's longitudinal record indicates which state the student is in. A second set of dummy variables groups charter school students within states so that charter school students within each state are separately identified. The addition of these variables produces a measure of how much the academic growth of students in charter schools within each state differ from their virtual twins, on average. It is important to note that the state-by-state results already have differences in family background of students neutralized.

The resulting comparisons show the variation across states of the differences in growth between charter school students and their TPS counterparts and illustrate that considerable variation exists across states in the performance of their charter school students. The results appear in Figures 11 through 14.

Relative to their TPS peers, the average performance of charter students in reading was significantly positive in Arkansas, California, Colorado (Denver), Louisiana, Missouri, and North Carolina. In the District of Columbia, Georgia, Illinois (Chicago) and Ohio, the effect was not significantly different than the gains for their TPS peers. In Arizona, Florida, Minnesota, New Mexico and Texas, the effect for charter school students was significantly worse than the gains realized by the TPS students.

The breakouts by state are also shown for growth in math scores. With the exception of the District of Columbia, students in all the states were significantly different in math gains than their TPS peers, though not all in the same direction. States whose students had significantly higher gains included Arkansas, Colorado (Denver), Illinois (Chicago), Louisiana, and Missouri. The marginal increase ranged from .02 standard deviations in Illinois (Chicago) to .07 standard deviations in Colorado (Denver). In Arizona, California, Florida, Georgia, Minnesota, New Mexico, North Carolina, Ohio and Texas, charter school students' gains were eclipsed by their TPS virtual twins. In this group, the marginal shift ranged from -.01 standard deviations in Georgia to -.06 standard deviations in Ohio.

Figure 11: Charter School Effect by State – AR, AZ, CA and CO

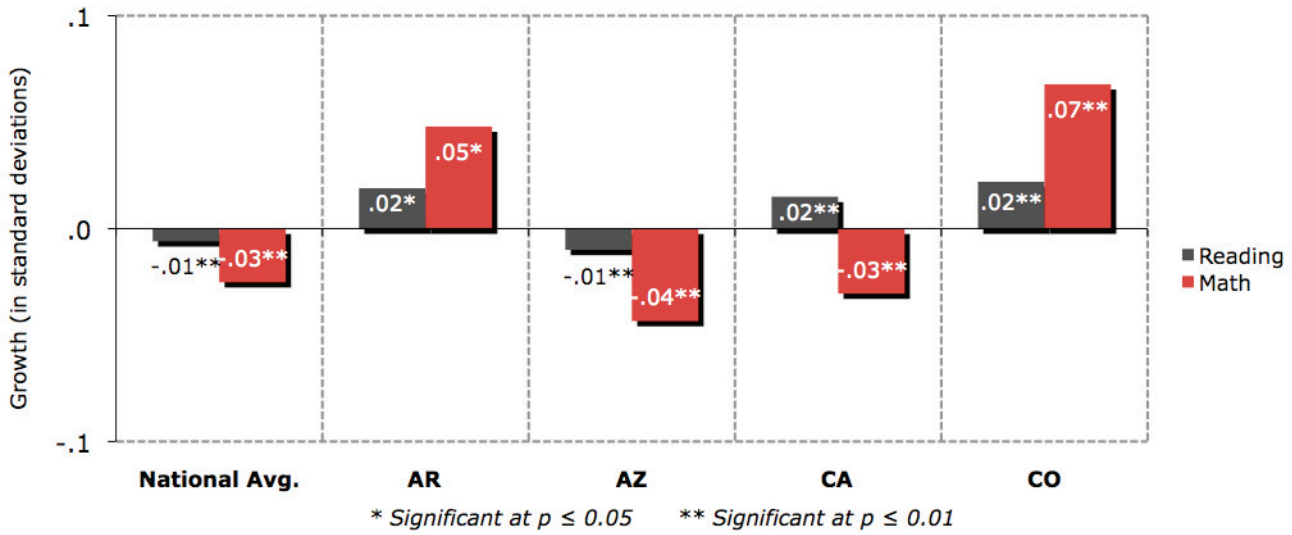
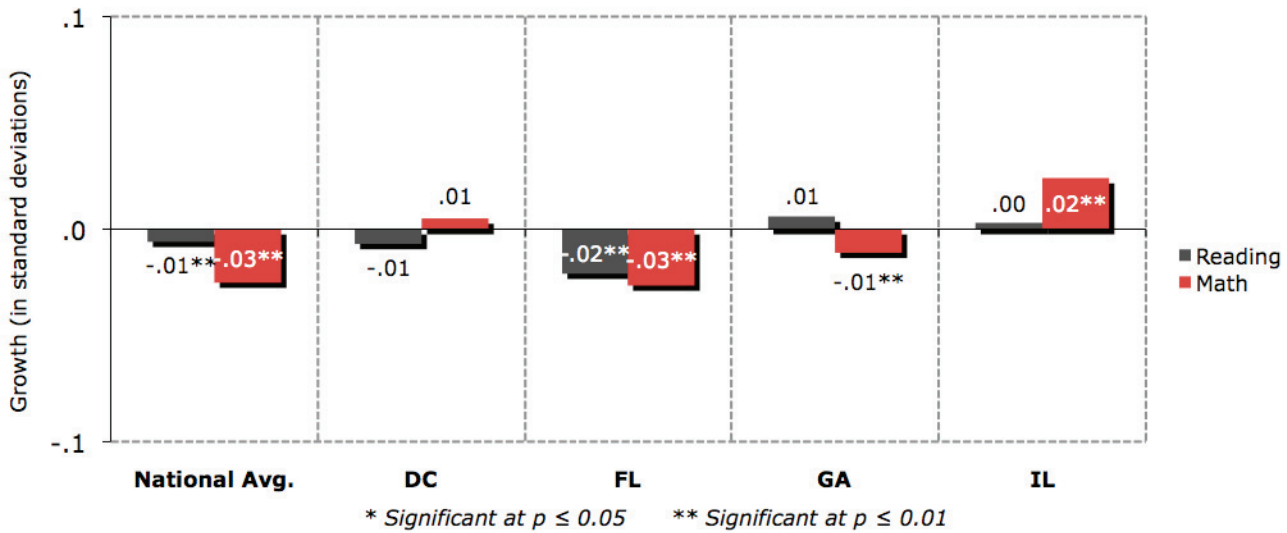
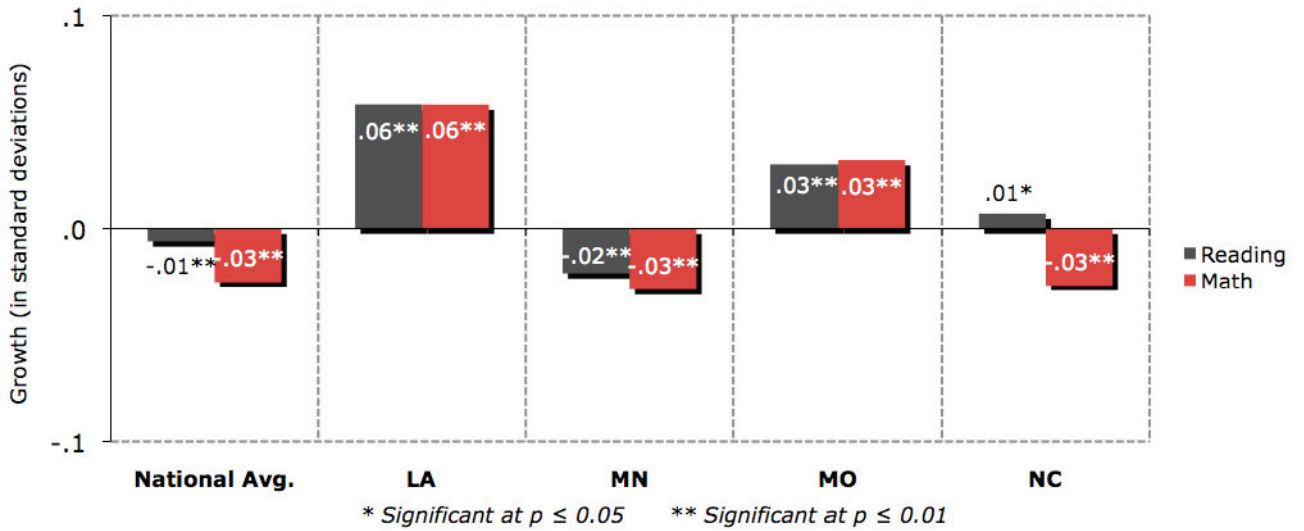


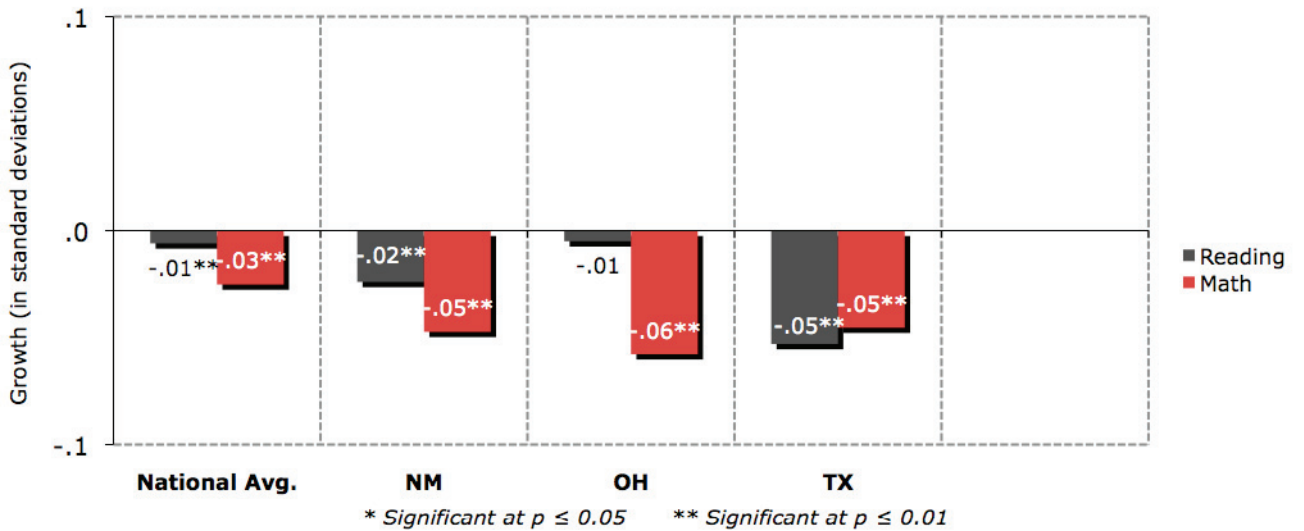
Figure 12: Charter School Effect by State – DC, FL, GA and IL



**Figure 13: Charter School Effect by State – LA, MN, MO and NC**



**Figure 14: Charter School Effect by State – NM, OH and TX**



Figures 11 through 14 show in a striking way that states differ widely in how effective their charter schools are on average. These changes occur over and above the basic differences in student populations. The disparity in effects across states leads one to question how state charter policy differences contribute to these results.

## **EFFECT OF STATE CHARTER SCHOOL POLICY ON PERFORMANCE**

Our pooled 16-state dataset offers a unique chance to study how state charter school policies influence the quality of schools. Earlier charter school research has been conducted chiefly within single states, such as Texas, Massachusetts, North Carolina or Florida.<sup>14</sup> Since all the schools within a state operate in the same policy environment, the influence of specific features of the policy is constant for all. However, the characteristics of each of the sixteen states in this study are sufficiently varied that it is possible to examine how school quality is shaped by the contours of the charter laws under which they function.

For each of the states in our study, we examined the charter legislation from its initial passage until 2008. We studied the use of three policy instruments. Our basic regression model was expanded to include variables for each of the policies, so their effects could be estimated simultaneously.

The first is the use of a cap on the supply of charters. We include two formulations of the cap factor. The first tests the conventional notion that limits imposed by the cap have restricted the supply of charter schools in the states that have them. New York, for example, had a cap of 100 schools for nearly 10 years, which constrained the growth of the sector in significant ways. The conventional view would suggest that caps exert equivalent influence across states simply because they exist.

A more nuanced view of caps is that their impact is immaterial until the supply of charters begins to approach the limit. In the extreme example of California, the cap has been in place for over fifteen years but always operates at a comfortable distance from the current level of supply. (As of mid-2009, there is leeway for an additional 400 charters in California, or about 5 times the number of schools that opened each year of this study.) One would be hard pressed to consider California's cap much of a factor in the charter landscape. And other states have a similar result – either the cap is generous or growth is slow or both. Discerning the point of friction would be an interesting study in itself, but for this analysis we consider the case where the supply of charters has reached 90 percent of the limit.

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<sup>14</sup>Hanushek, E., Kain, J., Rivkin, S. & Branch, G. (2007). *Charter School Quality and Parental Decision Making with School Choice*. Journal of Public Economics, Elsevier, vol. 91(5-6), pages 823-848, June.

Kane, T., Abdulkadiroglu, A., Angrist, J., Cohodes, S., Dynarski, S., Fullerton, J., & Pathak, P. (2009). *Informing the debate: Comparing Boston's charter, pilot, and traditional schools*. Boston, MA: Boston Foundation.

Bifulco, R., and Ladd, H. (2006). *The Impact of Charter Schools on Student Achievement: Evidence from North Carolina*. American Education Finance Association, 1(1), 50-90, Winter.

Hassel, B., Terrell, M., & Kowal, J. (2006). *Florida Charter Schools: Hot and Humid with Passing Storms*. Washington, DC: Education Sector.

The impact of charter school caps on school quality and student performance is less clear. One possibility is that a limit on the permissible number of schools generates pressure to allocate charters to maximize the chance of high performance. This view assumes that authorizers have sufficient information and expertise at the point of charter application to judge the likely future performance of schools. Alternatively, caps may produce the opposite effect by raising a barrier to entry that sends talented or successful operators to less restrictive states.

The second policy factor in this analysis is the availability of multiple authorizers. Empowering entities outside the traditional public K-12 education milieu to grant charters provides diversity in perspective about school choice and can bring a wider range of knowledge and experience to bear on charter growth. At the same time, authorizers exercise a considerable degree of latitude in their practice, which may present schools with different opportunity costs when given a choice of authorizers, and the response mechanism of schools is unclear.

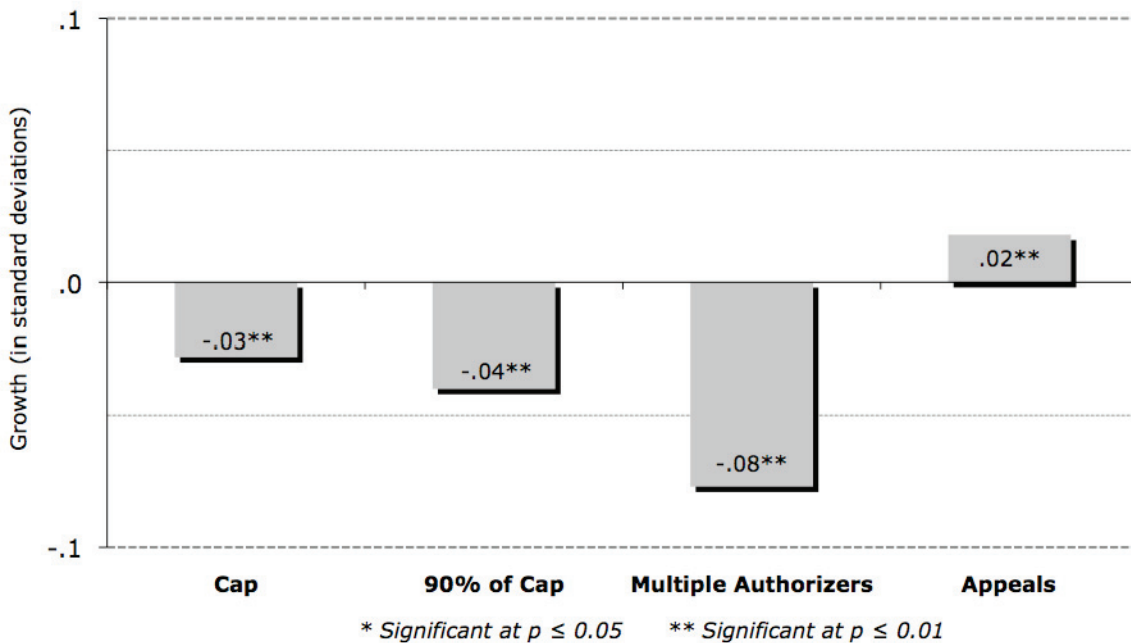
The third policy factor is the availability of an appeals process to review authorizer decisions. A number of charter states built an appeal mechanism into the initial legislation, while others have never had one. A similar question about the effect on school quality arises for appeals as it did for multiple authorizers. Does the option of an appeal increase the proportion of marginal schools, dragging down the overall performance of the sector? Does the option of an appeal potentially add additional scrutiny to decisions at the authorizer level? By examining the use of an appeals process across states, these questions can begin to be answered.

For each of these policy elements, we created a binary variable; since the conditions for charters can and did change in some states, the variables were coded for each state by year.

Adding these policy variables to the national pooled models, we examined two related questions. First, where each of these factors operates, is student academic growth different from places where they don't? To answer this question we examine the impact of each policy factor across the pooled sample, using the variation across both time and states to estimate effects. This view provides the average effect on performance. Second, if a state changes their use of each of the policy instruments, what is the marginal impact on student growth? This question required the inclusion of state fixed effects to isolate the variation within states when their status on any of these factors changes.

Figure 15 presents the results for reading. Since the sign and magnitude of the results for math are identical with respect to both the direction of effect and significance and also virtually identical in effect sizes, the graphical representation of reading, seen below, serves well for both.

Figure 15: Charter School Effect of Policy Variables



**Charter Caps.** Our results show that, in general, the presence of caps puts significant downward pressure on student results. Per year, states with charter caps experience about .03 standard deviation lower growth than states where no cap exists. Where the supply of charters approaches 90 percent of the cap, that effect is magnified to .04 standard deviations each year.

However, when a state elects to eliminate its cap, it can expect a gain in academic achievement growth of about .04 standard deviations. Alternatively, were a state to elect to impose a cap where it previously did not exist, it should expect a decline in growth of .04 standard deviations.

**Multiple Authorizers.** The impact of multiple authorizers on student academic gains is more straightforward. Where state legislation provides for multiple authorizers, there is a significant negative impact on student academic growth, reducing learning gains by .08 standard deviations. This finding suggests that applicants are strategic in their choice of authorizer and look for the option that is “easiest” on charters. If this interpretation is correct, we ought to be able to see a downward drift in quality over time if a state changes its policy to offer charters different authorizer options. The fixed effects model gives a slight indication of the trend; the shift in student growth is negative and modest for the sample, but is not statistically significant.

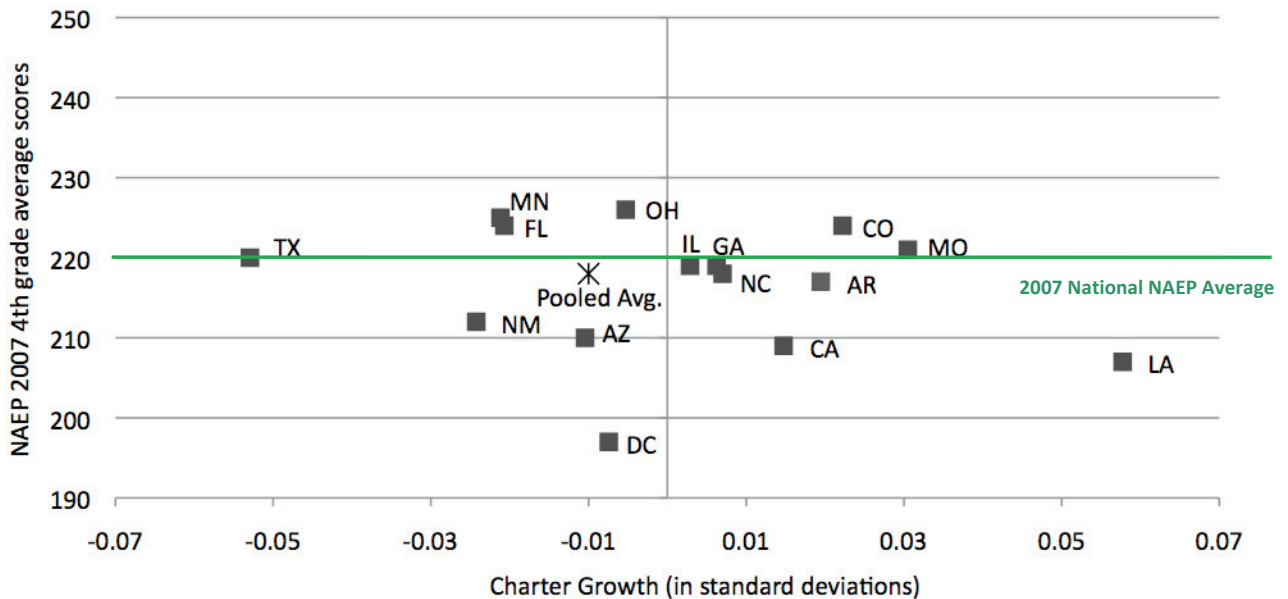
The impact of policy change for multiple authorizers is not particularly surprising. The time to “shop” for an authorizer is at the point of either application or renewal. Considering that only two of the sixteen states changed their rules regarding authorizers during the period of the study, most of the schools in those states were already operating and thus would have to wait for the end of their charter to shift. The schools that opened under the new conditions represent just a handful of the full set of new schools, so the effect is understandably weak.

**Appeals Process.** Across the sample of 16 states, the analysis shows that states with an appeals process observe a slight increase in the amount of growth in student performance, about .02 standard deviations. This increase is statistically significant.

Because none of the sixteen states changed their initial position concerning an appeals process throughout the years of the study, it is not possible at this time to estimate the impact within any states of such a change.

It should be clear that both the pooled aggregate and the state-specific effects each only tell a part of the story. The variation across states in charter school performance fails to take into account the differences in their overall education quality. To illustrate the effects of charters in the larger landscape of education performance, the individual state effects in reading and math are mapped relative to their own state average performance on NAEP in Figures 16 and 17. The pooled averages are indicated with a “\*.” The green lines in each figure represent the national average 4<sup>th</sup> grade NAEP score in 2007.<sup>15</sup>

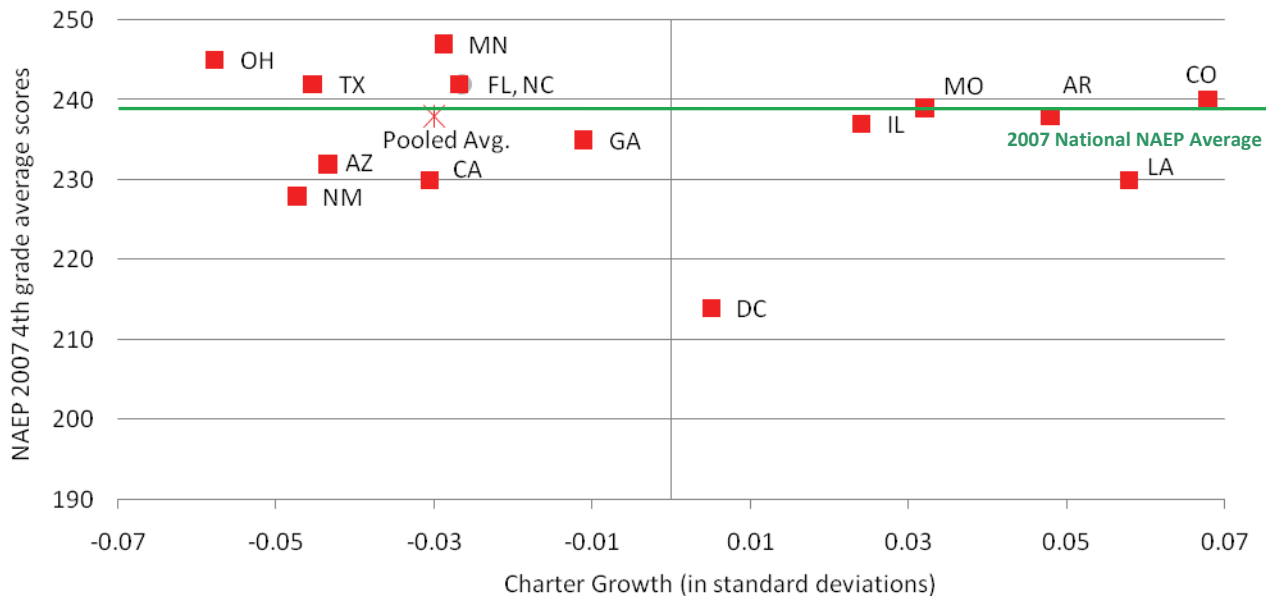
**Figure 16: Charter Effects Compared to 2007 NAEP Score by State – Reading**



<sup>15</sup> Pooled averages use the weighted average of 2007 NAEP 4<sup>th</sup> grade scores for 16 states included in this study. In reading that average is 218 compared to the national NAEP average of 220. In math the pooled average for states included is 238 compared to national NAEP average of 239.

As can be seen in Figure 16 above, the results for reading are fairly dispersed. Colorado (Denver) and Missouri show equal or better than average performance on NAEP and positive charter school effects.<sup>16</sup> Arkansas, California, Georgia, Illinois (Chicago), Louisiana and North Carolina all score lower than the NAEP average but still have positive charter growth. Less favorable results are apparent in Arizona, the District of Columbia and New Mexico as their NAEP scores are less than the national average and their charter school effect is negative. In Florida, Minnesota, Ohio and Texas charters also have negative charter effects but their NAEP scores beat the national average. The overall array of results suggests that charters may have better impacts if they operate in states with low overall performance, and is worthy of further study.

**Figure 17: Charter Effects Compared to 2007 NAEP Score by State – Math**



As can be seen in Figure 17 above, the results for math are differently dispersed than for reading, and seem to cluster in two areas. Colorado (Denver) and Missouri again show equal or better performance on NAEP and have positive charter school effects. Arkansas, the District of Columbia, Illinois (Chicago) and Louisiana all score lower than the NAEP average but still have positive charter effects. Less favorable results are apparent in Arizona and New Mexico again. In math results they are joined by California and Georgia as states where their NAEP scores are less than the national average and they have negative charter school effects. In Florida, Minnesota, North Carolina, Ohio and Texas charters also have negative charter effects but their NAEP scores beat the national average.

<sup>16</sup> The effects for each state are taken from the coefficients of charter-state interactions and reflect the direction and magnitude of average charter school student academic growth compared to that achieved by their virtual peers in TPS.



## VI. CHARTER SCHOOL PERFORMANCE BY MARKET

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Throughout the prior two sections, we examined school performance for charters at state and national levels of aggregation. Another way to look at them is to look at each charter school and the public schools from which it draws students as a separate market. This highly localized analysis allows us to place exacting conditions on the general standard we have used throughout this study: Do charter schools create student outcomes that are on par with what the students would have realized had they enrolled instead in the traditional public schools of their community. Choice for choice's sake is defensible only when results are on par.<sup>17</sup>

Because we use a virtual twin comparison, it is possible to provide a market-specific judgment of the relative performance of charter schools. We can compare the learning gains of their students directly head-to-head with those of their virtual twins. Aggregating the learning gains of all a charter school's virtual twins creates something akin to a virtual school — one with parallel students and starting scores as the charter school. Differences in the amount of advancement between the two groups can be examined to answer the question, “Do charter schools do better at producing learning gains for students than they otherwise would have obtained in their local community?”

The analysis employs a statistical technique, fixed effects, which is applied to each pair of charter and virtual schools to remove all the effects that are shared and constant over time. The average growth of students in each charter school is then computed relative to the average results of their virtual twins. The relative growth is then plotted graphically to make the distribution easy to grasp.

The result is the Quality Curve for math for charter schools and appears in Figure 18.<sup>18</sup> At zero, a charter school has average growth that exactly matches that of the comparison growth. At +1, the math growth of students in the charter school is one standard deviation better than would have occurred if the charter students had been in TPS instead. In percentile terms, if the TPS growth is at the 50<sup>th</sup> percentile, one standard deviation higher growth in the charter school would place it at the 84<sup>th</sup>. Likewise if a charter school's relative score is -1, they lag the TPS comparison by one standard deviation, the equivalent of being at the 16<sup>th</sup> percentile when the TPS growth is at the 50<sup>th</sup>.

Two curves appear in Figure 18. The black line shows the Quality Curve for all charters in the study. It shows the results for 2403 charter schools. However, in some cases, the differences in average growth between a charter and its TPS comparison might not be significant (because the range of student scores that make up the school's average is wide), so the curve is redrawn in red to show only those schools with statistically significant results. The red curve includes 1298 schools.

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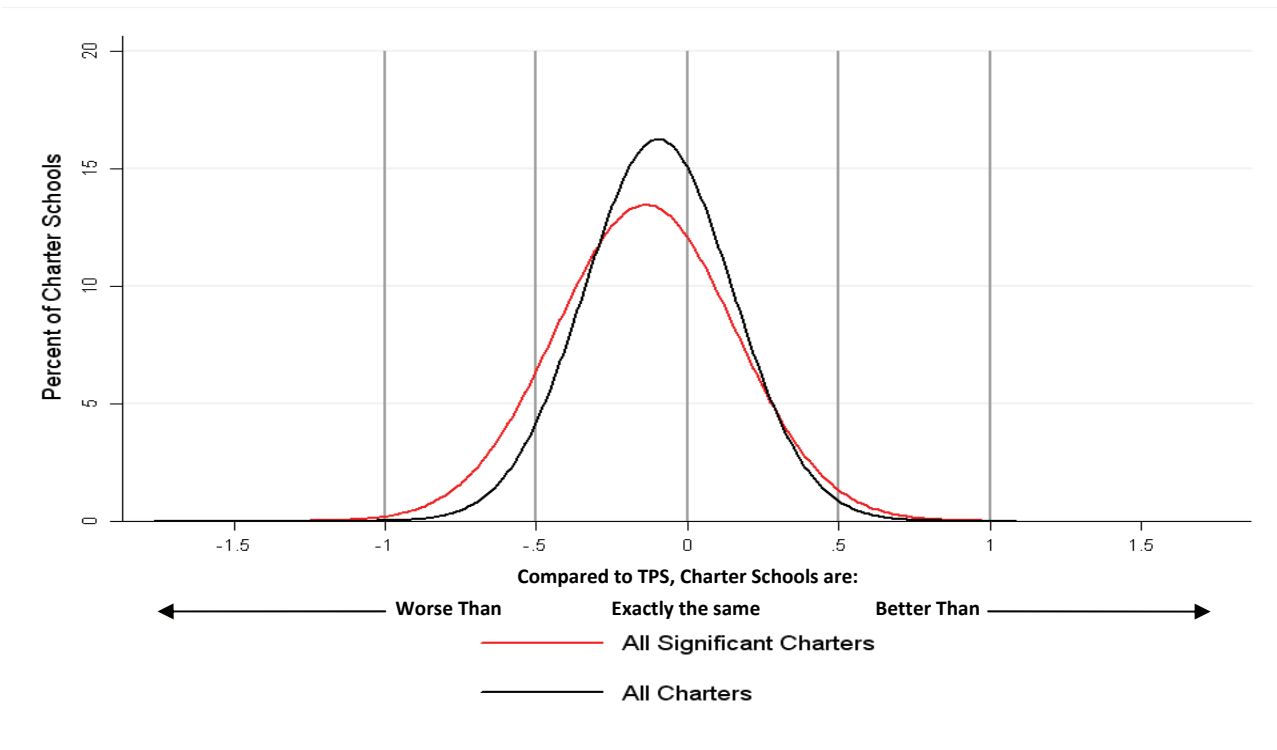
<sup>17</sup> We make no attempt to judge the overall level of performance or whether the existing performance is acceptable or not. This analysis is purely relative.

<sup>18</sup> The calculations for reading are so similar that we present only one curve.

Either curve tells a sobering story. When examined by market — that is, by each charter and its virtual school — more than half the charters have less growth in learning than what their students would have realized if they had remained in traditional schools in their community. This finding says nothing about how well the local traditional schools are doing; it merely assesses the expectation that whatever the level, charters serving the same population should produce results at the same level.

Across the full set of 2403 charter schools, 46 percent were not significantly different than the TPS virtual school in their math gains. Seventeen percent of charter schools had math gains that were significantly better than the TPS results. But 37 percent had results that were significantly negative relative to the growth their students would have realized if they attended traditional public schools. And the proportion of schools whose relative growth at -0.5 standard deviation or more is four times the number of schools with relative growth of +0.5 standard deviations or better.

**Figure 18: Market Fixed Effects Quality Curve**



**Table 9: Market Fixed Effects – Percentage of Charter Schools by Significance**

Negative and Significant	Not Significant	Positive and Significant
37%	46%	17%

## VII. SUMMARY OF FINDINGS

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Our national pooled analysis reveals, on the whole, a slightly negative picture of average charter school performance nationwide. On average, charter school students can expect to see their academic growth be somewhat lower than their traditional public school peers, though the absolute differences are small. Charter students trail the academic growth of TPS students by .01 standard deviations in reading, and by .03 standard deviations in math. Though small, these effects are statistically significant. These findings hold for students across the board of initial starting scores, except for students in the lowest and highest starting deciles in reading.

There is some good news as well. Nationally, elementary and middle school charter students exhibited higher learning gains than equivalent students in the traditional public school system. In addition, some subgroups demonstrated greater academic growth than their TPS twins. Specifically, students in poverty and ELL students experience larger learning gains in charter schools. Other subgroups, however, including Black and Hispanic students as a whole, have learning gains that are significantly smaller than those of their TPS twins.

Our pooled study also revealed that time plays a significant role in the academic growth of charter school students. First year charter students experience significantly smaller learning gains compared to their TPS peers. Second and third year charter students not only reverse this trend, but can anticipate larger learning gains than those of their TPS counterparts.

The effectiveness of charter schools was found to vary widely by state. In five states - Arkansas, Colorado (Denver), Illinois (Chicago), Louisiana, and Missouri - charter school students experienced significantly larger growth — ranging from .02 standard deviations to .07 standard deviations — than would have occurred in TPS. In six states — Arizona, Florida, Minnesota, New Mexico, Ohio, and Texas — charter school students experienced lower learning gains — ranging from -.01 to -.06 — than would have occurred in TPS. In four states — California, District of Columbia, Georgia, and North Carolina — the results were mixed or no different from the gains for TPS.

Differences across states in their charter school policies help to explain part of the observed differences in student results. This study reveals that state laws governing charter school operation have an important impact on student academic growth. Specifically, the presence of a charter school cap correlates with -.03 standard deviations of academic growth. Similarly, states permitting multiple entities to serve as authorizers for charter schools also exhibit negative academic growth, approximately -.08 standard deviations. However, states that allow charters to appeal an adverse decision on either initial charter applications or renewals experience slight positive academic growth, about .02 standard deviations.

Our use of relative academic growth as a principal metric can sometimes mask the extent of absolute differences between states. The state-to-state difference in charter school effect is in addition to existing differences among states in their overall academic performance. When the charter school impacts for each state are juxtaposed with the state's average results from the 4th grade National Assessment of Educational Progress (NAEP), a more complete picture emerges of charter school performance in the context of overall state academic performance. It is clear that modest relative growth in high performing states reflects better absolute performance than strong growth in low performing states. Further, results presented in this format cast an even longer shadow on low performing charter schools in states already struggling with poor absolute performance.

Perhaps most revealing is the distribution of charter school effects relative to their immediate TPS comparison groups. Realistically, the relative standard of performance-- whether charter schools are producing student outcomes that are at least as good as the schools in their community – is a fairly low threshold. This study provides a level playing field for that test. The Quality Curve shows that there are a substantial number of charter schools that provide superior and outstanding results for their students; 17 percent of the charters in this study deliver learning gains that are better than the results that their TPS peers achieve. These schools fulfill the promise of charter schools — both for the students they educate and for their collective demonstration that such schooling is feasible.

But the good news of the top performers is diminished by the preponderance of charter schools that do not perform to that high level. Thirty-seven percent of the charters in this study produce learning gains that are significantly worse than what equivalent TPS students accomplish. This proportion is both alarming and regrettable. These underperformers put the better charter schools and the more general charter school promise at risk.

Every study has its limits, and this report is no exception. Accordingly, it is important to be clear about what this study can and cannot say about charter school performance. We have explored the following: (1) the overall charter school academic achievement impacts relative to peers from TPS; (2) charter school impacts for particular student groups; and (3) how state specific charter school policies impact academic growth. This study does not reveal how grade-to-grade learning differs on average, or the relative success of charters closing the achievement gap compared to TPS. And for now, this research does not explain performance in terms of specific curricular emphasis or school model.

The study is also necessarily silent on the weight that academic progress should carry in individual school choice decisions. Parents want different things for their children, and it is part of the public school choice bargain that they are free to choose. It is not precisely clear where the line is drawn between parental preferences and the long-term interests of the student. It should be clear, however, that the latitude to trade academic growth (and therefore ultimate attainment) against other factors has its limits. Few could argue that schools that dramatically short the academic growth of their students can justify continuation on other grounds.

Notably, this study may well pose more questions than it answers. Academic performance is here largely assessed in the aggregate, and the results of further disaggregation are as yet unknown. Are particular subgroups seeing positive academic growth in particular charter school markets? Do charter schools from networks fare better? What other school characteristics are important predictors of charter school quality or its lack? What does the early performance of charter schools portend for them in future years? We plan to explore these questions and others like them in our upcoming report.



## VIII. POLICY IMPLICATIONS

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As of 2009, more than 4700 charter schools enroll over 1.4 million children in 40 states and the District of Columbia. The ranks of charters grow by hundreds each year. Even so, more than 365,000 names linger on charter school wait lists.<sup>19</sup> After more than fifteen years, there is no doubt that both supply and demand in the charter sector are strong.

In some ways, however, charter schools are just beginning to come into their own. Charter schools have become a rallying cry for education reformers across the country, with every expectation that they will continue to figure prominently in national educational strategy in the months and years to come. And yet, this study reveals in unmistakable terms that while some charter students are faring as well as their TPS counterparts, many others do not. Further, tremendous variation in academic quality among charters is the strongest result of the study, making the problem of quality the most pressing issue that charter schools and their supporters face.

The study findings reported here give the first wide-angle view of the charter school landscape in the United States. It is the first time a sufficiently large body of student-level data has been compiled to create findings that could be considered “national” in scope. More important, they provide a broad common yardstick to support ongoing conversations about quality and performance. The dialog about charter school quality can be married to empirical evidence about performance. Further development of performance measures in forums like the Building Charter School Quality initiative could be greatly enhanced with complementary multi-state analyses such as this first report.

We freely acknowledge that this study is narrow in one respect: we only look at student academic growth in reading and math as the standard for evaluating the impact of charter schools. There are many other ways that charters may be having an impact on their students: increasing their attendance, slowing drop-out rates, wider exposure to college-preparatory curricula, and providing a well-rounded set of courses are just a few examples. There are obviously many ways to study schools in general and charters in particular. Clearly, any high stakes decision about charter schools needs to be informed with multiple measures of performance. Measures of academic progress in the basic subjects of reading and math are clear factors to include, and arguably, the most important.

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<sup>19</sup> National Alliance of Public Charter Schools as of June 3, 2009:  
<http://www.publiccharters.org/aboutschools/benefits>)

The news for charter schools has some encouraging facets. In our nationally pooled sample, two traditionally disadvantaged subgroups fare better in charters than in the traditional system: students in poverty and ELL students. This is no small feat. In these cases, our numbers indicate that charter students who fall into these categories are outperforming their TPS counterparts in both reading and math. These populations, then, have clearly been well served by the introduction of charters into the education landscape. These findings are particularly heartening for the charter advocates who target the most challenging educational populations or strive to improve education options in the most difficult communities. Charter schools that are organized around a mission to teach the most disadvantaged students in particular seem to have developed expertise in serving these communities. We recommend that schools or school models demonstrating success be further studied with an eye toward the notoriously difficult process of replication. Further, even for student subgroups in charters that had aggregate learning gains lagging behind their TPS peers, the analysis revealed charter schools in at least one state that demonstrated positive academic growth relative to TPS peers. These higher performers also have lessons to share that could improve the performance of the larger community of charter schools.

The flip-side of this insight should not be ignored either. Students not in poverty and students who are not English language learners do notably worse than the same students who remain in the traditional public school system. Additional work is needed to determine the reasons underlying this phenomenon. Perhaps these students are “off-mission” in the schools they attend. Perhaps they are left behind in otherwise high-performing charter schools, or perhaps these findings are a reflection of a large pool of generally underperforming schools. Whatever the reason, the policy community needs to be aware of this dichotomy, and greater attention should be paid to the vast number of students not being well served in charter schools.

In addition, we know now that first year charter students suffer a sharp decline in academic growth. Equipped with this knowledge, charter school operators can perhaps take appropriate steps to mitigate or reverse this “first year effect.”

Despite promising results in a number of states and within certain subgroups, the overall findings of this report indicate a disturbing — and far-reaching — subset of poorly performing charter schools. If charter schools are to flourish and deliver on promises made by proponents, a deliberate and sustained effort to increase the proportion of high quality schools is essential. The replication of successful school models is one important element of this effort. On the other side of the equation, however, authorizers must be willing and able to fulfill their end of the original charter school bargain: accountability in exchange for flexibility. When schools consistently fail, they should be closed.



Though simple in formulation, this task has proven to be extremely difficult in practice. Simply put, neither market mechanisms nor regulatory oversight been a sufficient force to deal with underperforming schools. At present there appears to be an authorizing crisis in the charter school sector. For a number of reasons — many of them understandable — authorizers find it difficult to close poorly performing schools. Despite low test scores, failing charter schools often have powerful and persuasive supporters in their communities who feel strongly that shutting down *this* school does not serve the best interests of currently enrolled students. Evidence of financial insolvency or corrupt governance structure, less easy to dispute or defend, is much more likely to lead to school closures than poor academic performance. And yet, as this report demonstrates, the apparent reluctance of authorizers to close underperforming charters ultimately reflects poorly on charter schools as a whole. More importantly, it hurts students.

Charter schools are already expected to maintain transparency with regard to their operations and academic records, giving authorizers full access. We propose that authorizers be expected to do the same. True accountability demands that the public know the status of each school in an authorizer's portfolio, and that we be able to gauge authorizer performance just as authorizers currently gauge charter performance. To this end, we suggest the adoption of a national set of metrics, collected uniformly by all authorizers in order to provide a common baseline by which we can compare the performance of charter schools and the actions of authorizers across state lines. Using these metrics, Authorizer Report Cards would provide full transparency and put pressure on authorizers to act in clear cases of failure.

The charter school movement to date has concentrated its formidable resources and energy on removing barriers to charter school entry into the market. It is time to concentrate equally on removing the barriers to exit.