

CHARTER SCHOOL PERFORMANCE IN INDIANA

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TABLE OF CONTENTS

INTRODUCTION.....	3
CHARTER SCHOOL IMPACT BY STUDENTS’ YEARS OF ENROLLMENT AND AGE OF SCHOOL...	6
DISTRIBUTION OF CHARTER SCHOOL PERFORMANCE IN INDIANA.....	8
CHARTER SCHOOL IMPACT BY RACE/ETHNICITY	9
CHARTER SCHOOL IMPACT ON STUDENTS IN POVERTY.....	10
CHARTER SCHOOL IMPACT WITH SPECIAL EDUCATION STUDENTS.....	11
CHARTER SCHOOL IMPACT ON ENGLISH LANGUAGE LEARNERS	12
CHARTER SCHOOL IMPACTS WITH GRADE-REPEATING STUDENTS	13
CHARTER SCHOOL IMPACT BY STUDENT’S STARTING DECILE	14
SUMMARY OF FINDINGS.....	16

INTRODUCTION

Expanding on the 2009 CREDO National Charter School Study *Multiple Choice: Charter School Performance in 16 States*, this report examines the performance of Indiana charter schools for the period 2004 - 2008.¹

Compared to the educational gains the charter students would have had in their traditional public schools, the analysis shows that students in Indiana charter schools make dramatically larger learning gains. While there are a small number of schools with inferior performance in reading, nearly half the charter schools have significantly more positive learning gains than their traditional public school counterparts. In math, none of the charter schools studied performs worse than the traditional public schools and nearly one quarter out-perform them.

This analysis builds on the methodology used for the 2009 study.² The approach uses a quasi-experimental design of matched pairs that are followed over time. Learning gains as measured on state standardized achievement tests are the outcome used to gauge the contributions of charter schools compared to the learning gains that would have occurred for those students in traditional public school settings.

To create a reliable comparison group for our study, we attempted to build a Virtual Control Record (VCR) for each charter school student. Our approach is displayed in Figure 1. We identify all the traditional public schools 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 (t_0), CREDO selects all of the available records that match each charter school student.

Match factors include:

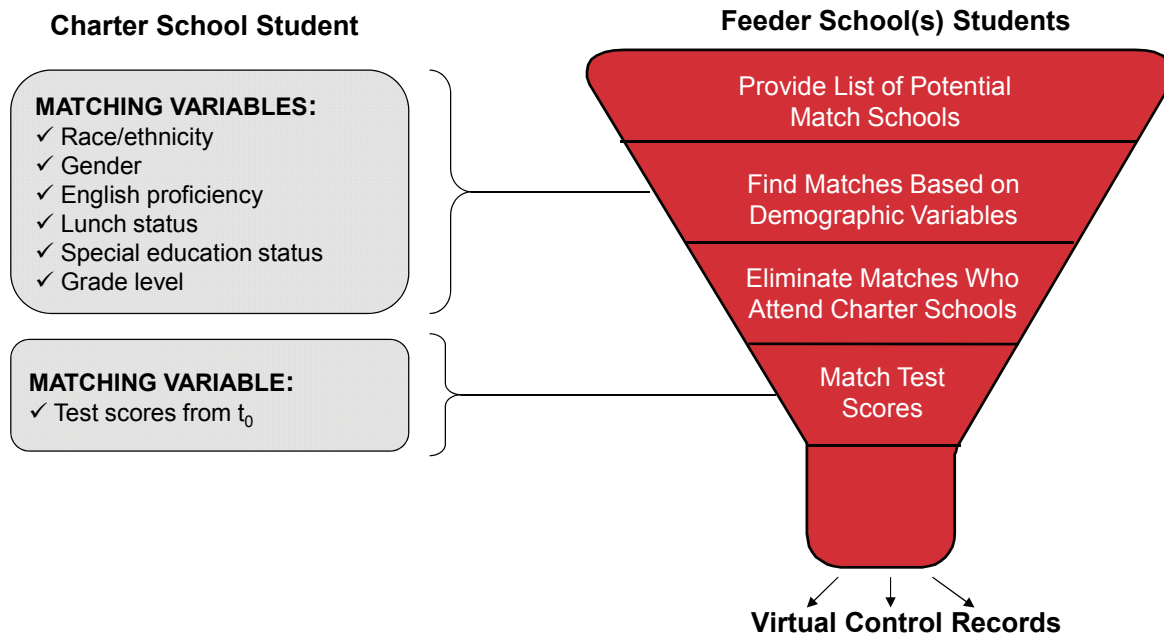
- Grade-level
- Gender
- Race/Ethnicity
- Free or Reduced Price Lunch Status
- English Language Learner Status
- Special Education Status
- Prior test score on state achievement tests

¹ A grant for this study was provided by the Joyce Foundation. CREDO gratefully acknowledges the support. The views in this report should not be construed to reflect positions of the Joyce Foundation; likewise, all errors are solely CREDO's.

² For the interested reader, the national report is available at credo.stanford.edu.

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 the specific school that originated the contributing records. 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. A technical appendix detailing our methodology is available at credo.stanford.edu.

Figure 1: CREDO VCR Methodology



This document reports on the analysis of 4 years of schooling, beginning with the 2004-2005 school year and concluding with the 2007-2008 data. A total of 8,959 charter school students from 42 charter schools are followed for as many years as data are available. The students are drawn from Grades 4 - 9, since these are the grades that are covered by the state achievement testing program that could be linked over this time period using our VCR methodology. An identical number of virtual comparison students are included in the analysis. In Indiana, it was possible to create virtual matches for 84 percent of the charter school students in reading and in math. This proportion assures that the results reported here can be considered indicative of the overall performance of charter schools in the state. The total number of observations is large enough to be confident that the tests of effect will be sensitive enough to detect real differences between charter school and traditional school students at the $p < .05$ level.

Academic growth on state achievement tests is used as the outcome of interest. The achievement testing for the years covered in this report occurred in the fall and therefore; the test covered the previous school year's academic progress. For purposes of this report, the time period denoted "2004" covers growth between the 2004-2005 and 2005-2006 school years. This period can also be thought of as the growth from fall 2005 test to fall 2006 test. The time period denoted "2005" corresponds to the year of growth between the 2005-2006 and 2006-2007 school years and the time period denoted "2006" corresponds to the year of growth between the 2006-2007 and 2007-2008 school years. In other words, the label refers to the first fall term of each growth period, not the fall of the testing year.

All test scores for each grade-subject-year test were standardized around the statewide average score for that specific test. The transformation of scores puts all tests on a common reference scale so that scores can be compared across subjects, across grades and across years. Academic growth for an individual student is judged relative to his place in the distribution of scores over time. If all students learn exactly the same amount in a year, then their places in the distribution will not change; but if some students learn more than others, then their scores moves ahead in the distribution.

In each case, the analysis examines whether students in charter schools in Indiana outperform their traditional public school counterparts under a variety of scenarios. In all the scenarios, a number of control factors are applied to the estimation so that the contribution of the schools themselves can be isolated from other potentially confounding influences. Each of the scenarios is presented in the following sections of the report.

First, we examine whether charter schools differ overall from traditional public schools in how much their students learn, while holding all other factors constant. The results appear in Figure 2. Students in Indiana charter schools learned significantly more on average than their virtual counterparts in both reading and mathematics. We also examine Indianapolis separately, and find similar results with charter students having significantly better gains than their virtual counterparts in both reading and math.

A Roadmap to the Graphics

The graphics in this report have a common format.

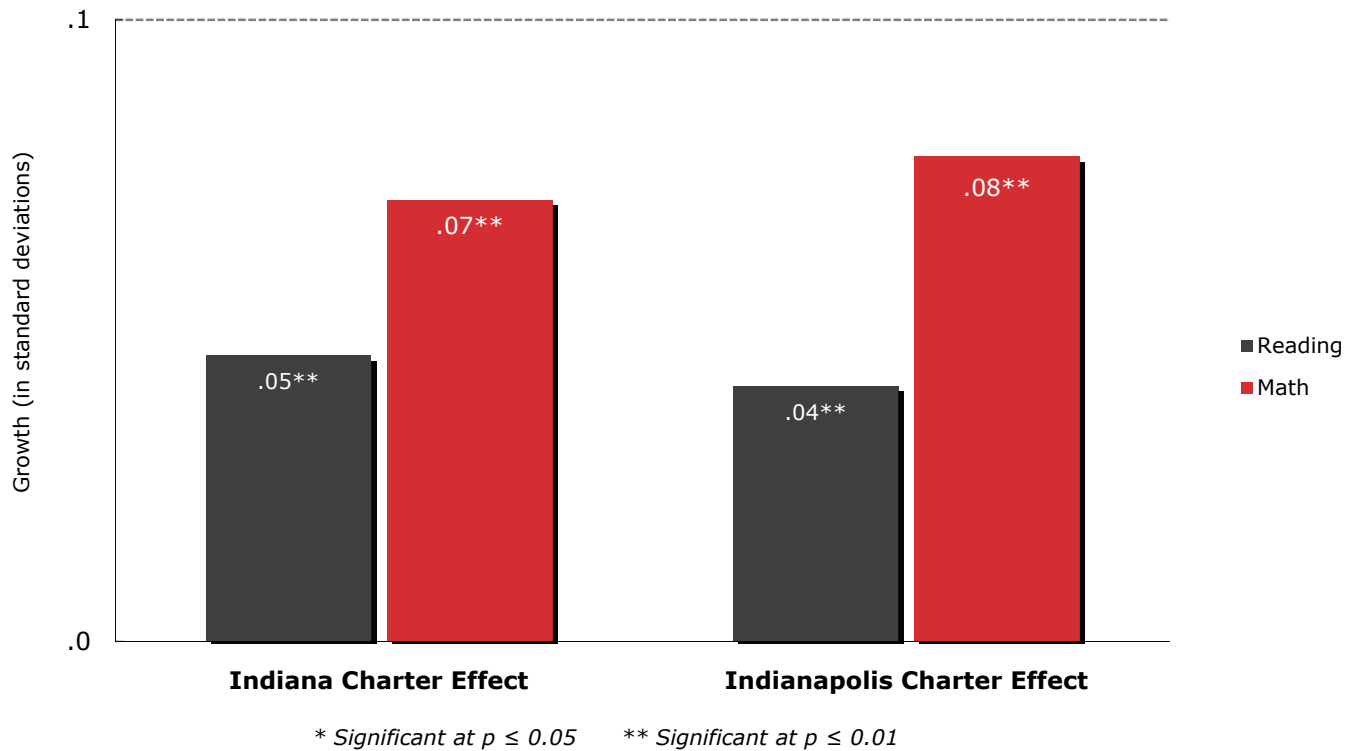
Each graph presents the average performance of charter students relative to their **pertinent comparison student**. The reference group differs depending on the specific comparison. Where a graph compares student sub-group performance, the pertinent comparison student is the same for both groups. Each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

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

Stars are used to reflect the level of statistical significance of the difference; the absence of stars means that the effect is not statistically different from zero.

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

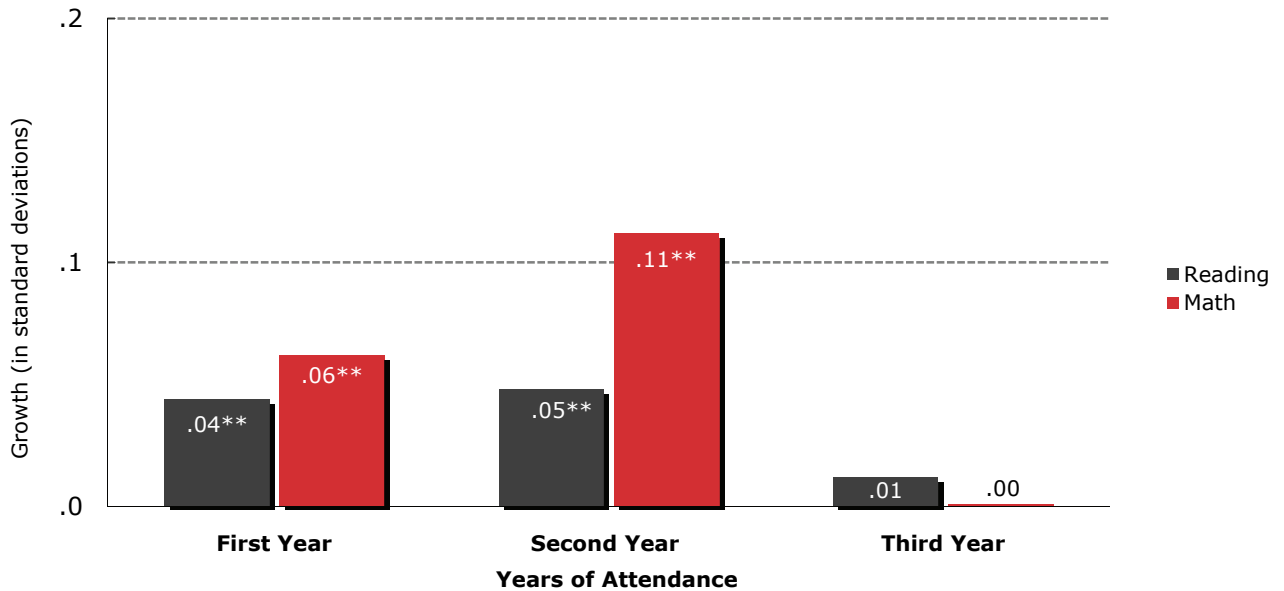
**Figure 2: Average Learning Gains in Indiana Charter Schools, 2004 – 2008
Compared to Gains for VCR Students in Each Charter Schools’ Feeder Schools**



CHARTER SCHOOL IMPACT BY STUDENTS’ YEARS OF ENROLLMENT AND AGE OF SCHOOL

To delve deeper into the charter school effects in Indiana, students were grouped by the number of consecutive years they were enrolled. In this scenario, we limit the analysis to the charter students who enrolled for the first time in the charter school between 2005-2006 and 2007-2008; although the number of students included will be smaller, it is the only way to make sure that the available test results align with the years of enrollment. This question examines whether the academic success of students who enroll in a charter school fluctuates as they continue their enrollment. The results appear in Figure 3 below.

Figure 3: Average Learning Gain by Students' Years of Enrollment in Charter Schools 2004 - 2008 Compared to the Average Learning Gain for VCR students in Feeder Schools

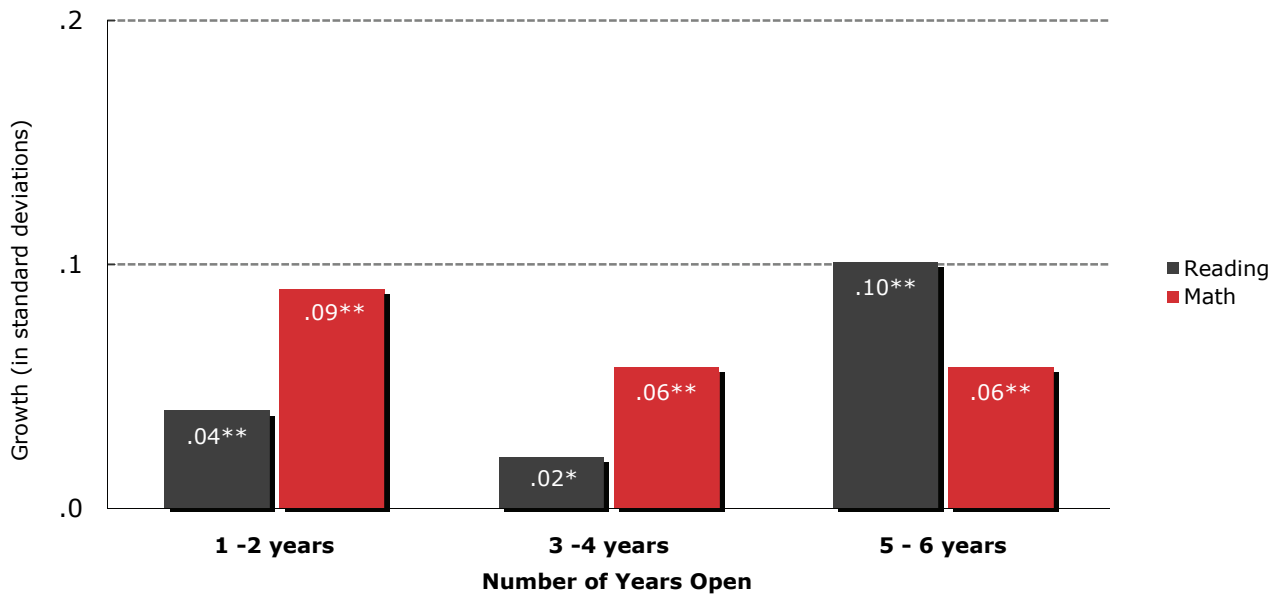


* Significant at $p \leq 0.05$ ** Significant at $p \leq 0.01$

The results suggest that new charter school students have an initial gain of learning compared to their counterparts in traditional public schools in reading and math. In the second year of attendance an even larger gain in learning compared to students in traditional public schools is observed in both reading and math. Starting in the third year there is no significant difference in learning compared to their counterparts in traditional public schools in either subject. As we were only able to test three growth periods we are not able to determine the trend in subsequent years of enrollment.

We also test the charter school effects based on the number of years a charter was open during the time period of study. These results can be seen in Figure 4.

**Figure 4: Average Learning Gains by Age of Charter School
Compared to the Average Learning Gain for VCR students in Feeder Schools**



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

We find that charter schools of all ages have positive and significant effects on learning gains in both reading and math for Indiana charter school students as compared to their traditional public school peers.

DISTRIBUTION OF CHARTER SCHOOL PERFORMANCE IN INDIANA

While numbers reported above represent the average learning gains for charter school students across the state, the average tells only part of the story. Parents and policy-makers are also interested in knowing the distribution around the average, and specifically how schools perform compared to it. In order to determine this distribution of performance, we test the average experience in the VCR sample for students in each school; put another way, we compared each school's average effect to the average of all the comparison students in traditional schools. The average VCR is the correct comparison, since charter schools are required to take any and all applicants or to select by lottery if they are oversubscribed.

Table 1 below shows the breakout of performance across the full set of 42 Indiana charter schools included in this study.

**Table 1: Performance of Indiana Charter Schools 2004 - 2008
Compared to Indiana Average VCR Learning Gains**

	Significantly Worse		No Significant Difference		Significantly Better	
	Number	Percent	Number	Percent	Number	Percent
Reading	1	2%	23	55%	18	43%
Math	0	0%	31	74%	11	26%

In 18 of the 42 charter schools (43%) have significantly better learning gains than traditional public schools in reading while 11 of the charter schools (26%) have significantly better learning gains in math. Only one charter school in Indiana shows lower growth than traditional public schools in reading and no charter school shows lower growth in math compared to traditional public schools.

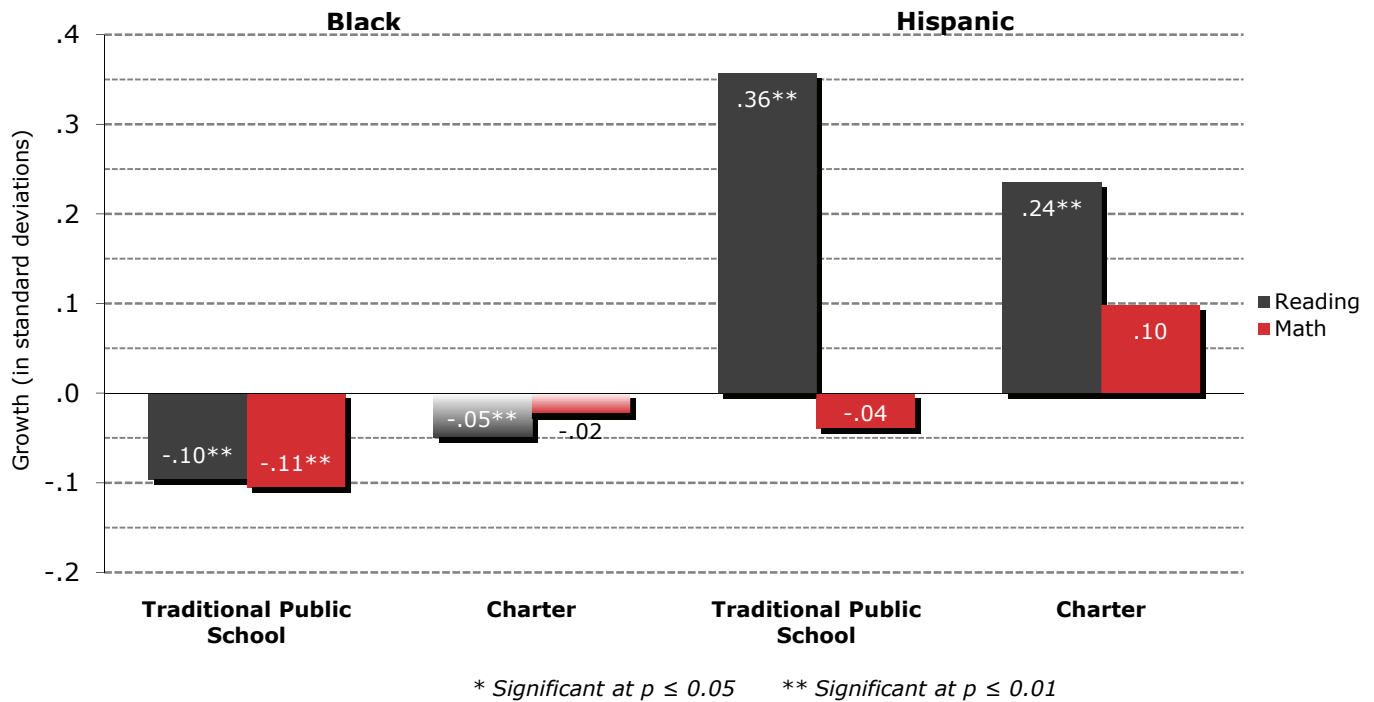
CHARTER SCHOOL IMPACT BY RACE/ETHNICITY

Attention in US public education to achievement differences by racial and ethnic backgrounds has increased in recent years. The effectiveness of charter schools across ethnic and racial dimensions is especially important since so many charter schools are focused on serving historically underserved minority students. The impact of charter schools on academic gains of Black and Hispanic students is presented in Figure 3, below.

The graph displays two distinct comparisons, described below:

- The first comparison displays the performance of traditional public students in the sub-groups of interest relative to the average white student in traditional public schools who does not qualify for Free or Reduced Price Lunch subsidies, Special Education services or English Language Learner support. The values that appear in each vertical bar indicate the magnitude of difference from the comparison student, with stars indicating the level of statistical significance. Thus, if there is no difference in the learning gains, the bar would be missing entirely; if the learning of the student group in question is not as great as the comparison baseline, the bar is negative and if the learning gains exceed the comparison, the bar is positive.
- A second comparison tests whether the learning gains in the charter school student sub-group differs significantly from their peers in the same student sub-group in TPS. Where the difference is significant, the charter school bar has gradient shading.

Figure 5: Average Learning Gains for Indiana Black and Hispanic Students Compared to White Traditional Public School VCR Gains



Black students in both traditional public and charter schools have smaller gains in reading than those of white students in traditional public schools, the baseline of comparison. Black students in traditional public schools also have learning deficits compared to the baseline student. However, Black students enrolled in charter schools show no significant difference as a result of charter school attendance compared to that same baseline, essentially learning at the same level as the average white student in traditional public schools in math. In both reading and math, Black students in charter schools have gains significantly better than Black students in traditional public schools.

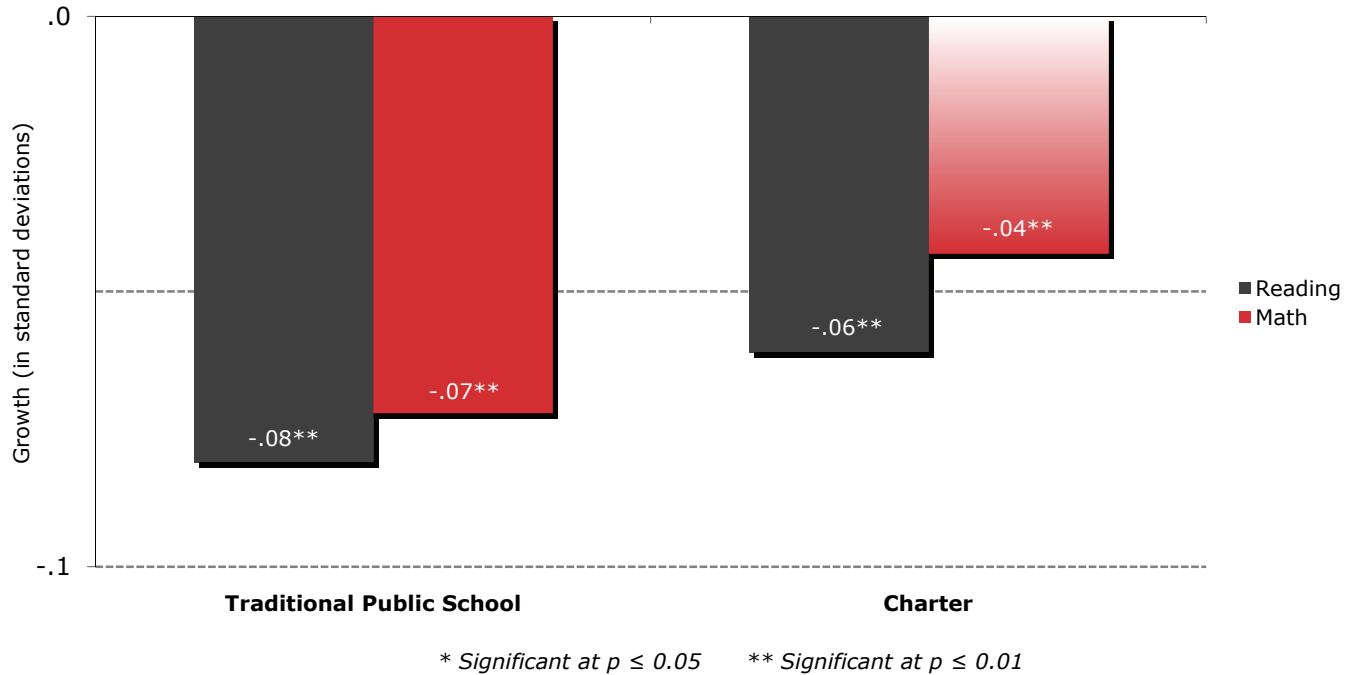
Hispanic students in both traditional schools and charter schools have gains in reading that are larger than those of white students in traditional public schools, the baseline of comparison. Hispanics enrolled in charter schools grow at similar rates compared to the average white student in traditional public schools in math. In both math and reading, Hispanic students in charter schools grow at similar rates to Hispanic students in traditional public schools.

CHARTER SCHOOL IMPACT ON STUDENTS IN POVERTY

Much of the motivation for developing charter schools aims at improving education outcomes for students who are in poverty. The enrollment profiles of charter schools across the country underscore this fact; in the Indiana sample 57 percent of the students are eligible for Free or Reduced Price Lunch, a proxy for low income households. Thus, the impact of charter schools on the learning of students in poverty is important both in terms of student outcomes and as a test of the commitment of charter school leaders and teachers to address the needs of the population in better ways than in other settings.

Figure 6 presents the results for Indiana. In this graph, the comparison student is a student who pays full price for lunch, a proxy for not being in poverty.

Figure 6: Average Learning Gains for Indiana Students in Poverty Compared to Non-Poverty VCR Gains



In Indiana, students in poverty grow at a rate significantly worse than their non-poverty peers. As shown in the figure above, students in poverty enrolled in charter schools receive no significant benefit or loss in reading but show better growth in math compared to students in poverty in traditional public schools.

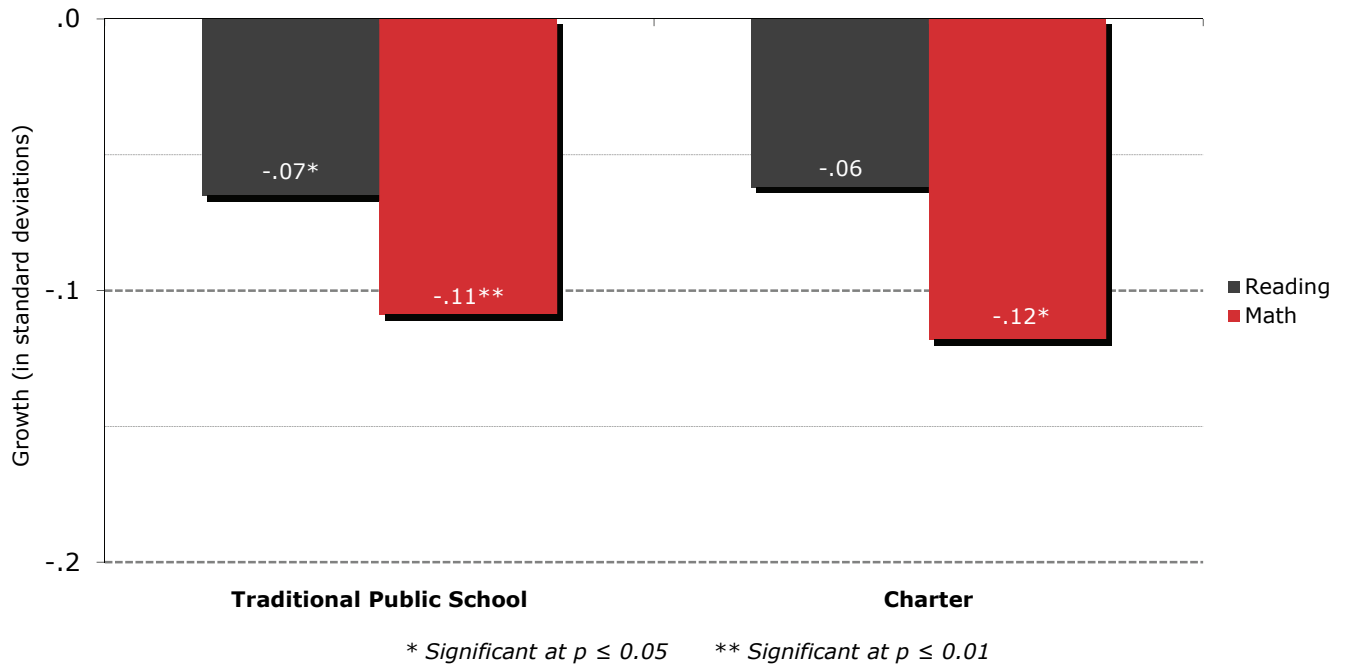
CHARTER SCHOOL IMPACT WITH SPECIAL EDUCATION STUDENTS

The demographic comparisons in the CREDO national charter school report released in 2009 indicated that across the charter sector, schools serve fewer Special Education students and in smaller proportions of their enrollment base than the traditional public schools. In some cases, this result is a deliberate and coordinated response with local districts, based on a balance of meeting the needs of the students and consideration of cost-effective strategies for doing so. In Indiana, the overall proportion of charter school students who are Special Education is 8 percent, which is significantly less than the 16 percent of students in traditional public schools who are Special Education in Indiana.

It is especially difficult to compare outcomes of Special Education students, regardless of where they enroll. The most serious problem is caused by small numbers and diverse typologies in use across states; the result is that there is tremendous variation when all categories are aggregated, a necessary and messy requirement. Of all the facets of the study, this one deserves the greatest degree of skepticism. With this cautionary note, the results are presented in Figure 7 below. The comparison

baseline is the typical academic growth of a traditional public school student who is not receiving Special Education services.

Figure 7: Average Learning Gains for Indiana Special Education Students Compared with Non-Special Education VCR Gains



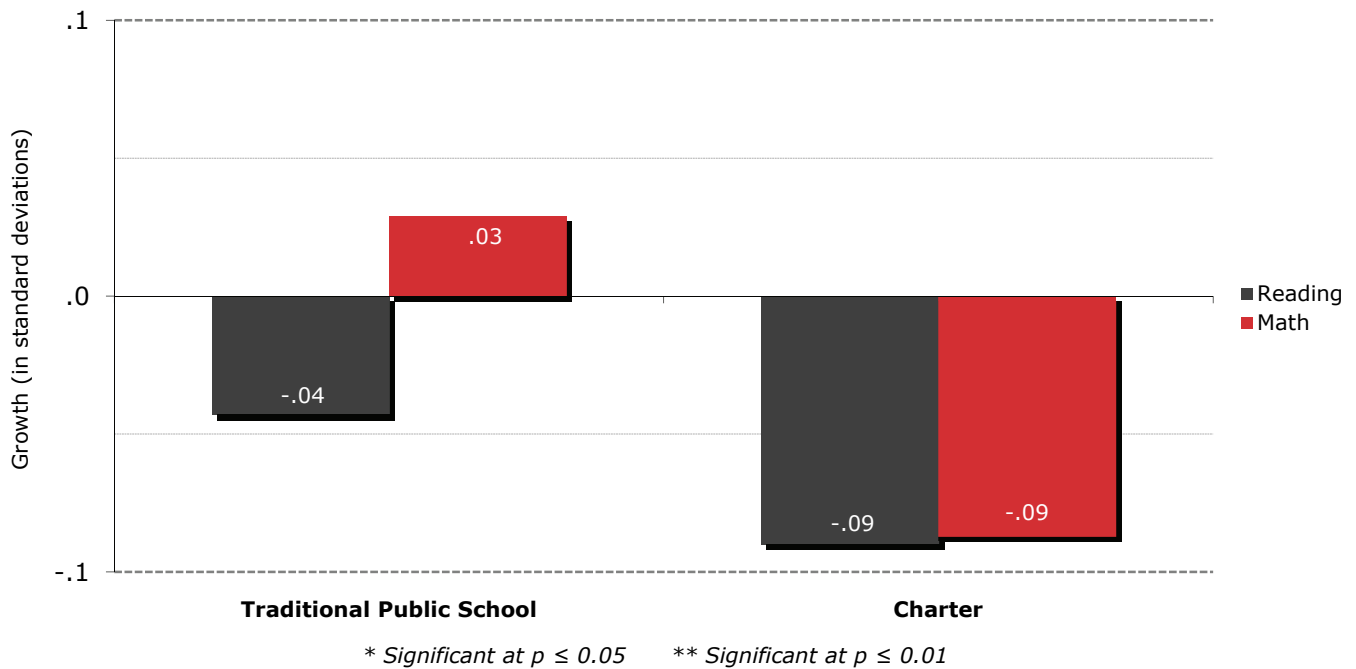
In charter schools in Indiana, Special Education students receive no significant benefit or loss from charter school attendance compared to their counterparts in traditional public schools in both reading and math.

CHARTER SCHOOL IMPACT ON ENGLISH LANGUAGE LEARNERS

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

The comparison of learning gains between charter school English Language Learners and their traditional school counterparts in Indiana appears in Figure 8. The baseline comparison student in this analysis is the typical traditional public school student who is a native English speaker.

Figure 8: Average Learning Gains for Indiana English Language Learners Compared with Native English Speaker VCR Gains

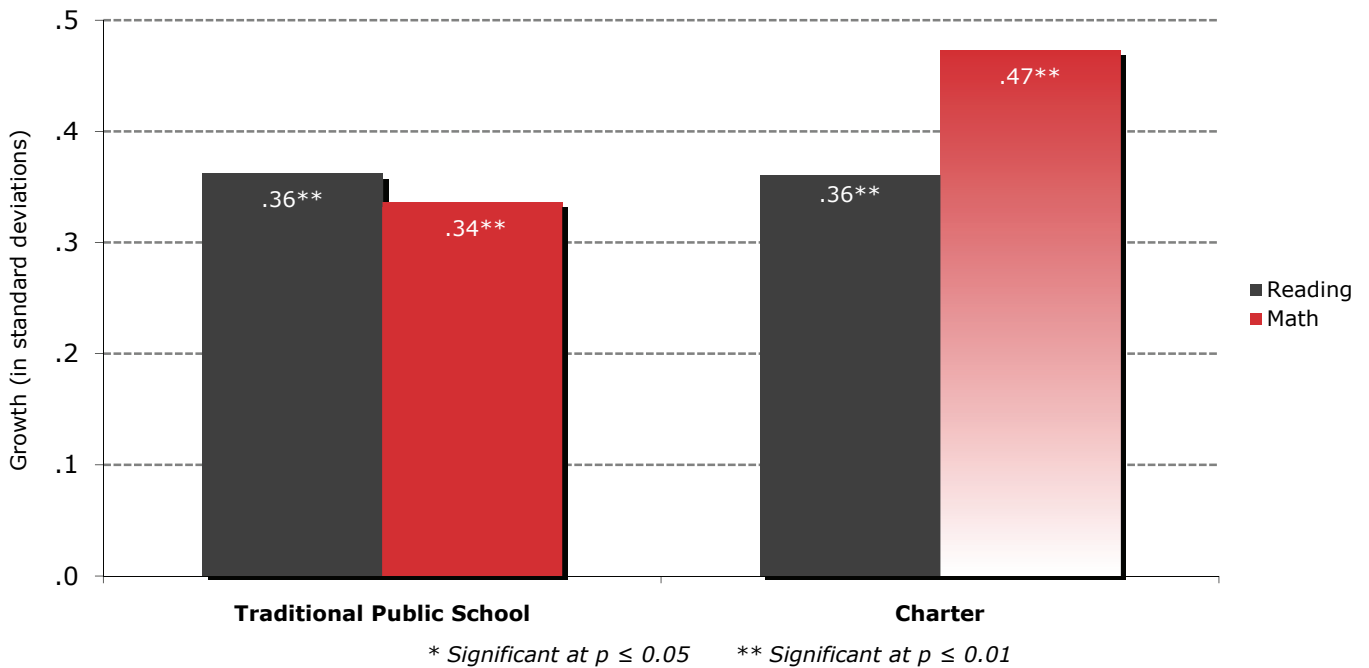


English Language Learner students in both traditional public schools and charter schools do not learn significantly different from the native/fluently English speakers in both reading and math.

CHARTER SCHOOL IMPACTS WITH GRADE-REPEATING STUDENTS

This study examined the outcomes of students who were retained. Often a highly charged topic, the underlying premise is that additional time in grade can help students by remediating deficits and shoring up grade-level competencies. Existing research on the outcomes of students who have been retained is limited and retention practices differ widely across the country and between the charter and traditional public school sectors. The fact that retained charter students have among the lowest match rates of any subgroup in our study suggests that charter schools are more likely to retain academically low-performing students. Regardless, in the observations of Indiana students, sufficient numbers of matches were found to enable the learning gains following retention to be estimated. The results appear in Figure 9.

Figure 9: Average Learning Gains for Indiana Grade-Repeating Students Compared with Non-Grade-Repeating VCR Gains



Retained students have gains better than non-retained students in both traditional public and charter schools in Indiana. Charter school students receive no significant benefit from charter school attendance compared to their counterparts in traditional public schools in reading but do have higher growth in math.

CHARTER SCHOOL IMPACT BY STUDENT'S STARTING DECILE

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

To do this, students were grouped into deciles based on their baseline test scores in reading and math on Indiana's achievement tests. The average growth of student achievement in each decile was then computed and compared. The results appear in Figures 10.a and 10.b below.

Figure 10.a: Impact by Students' Starting Decile - Reading

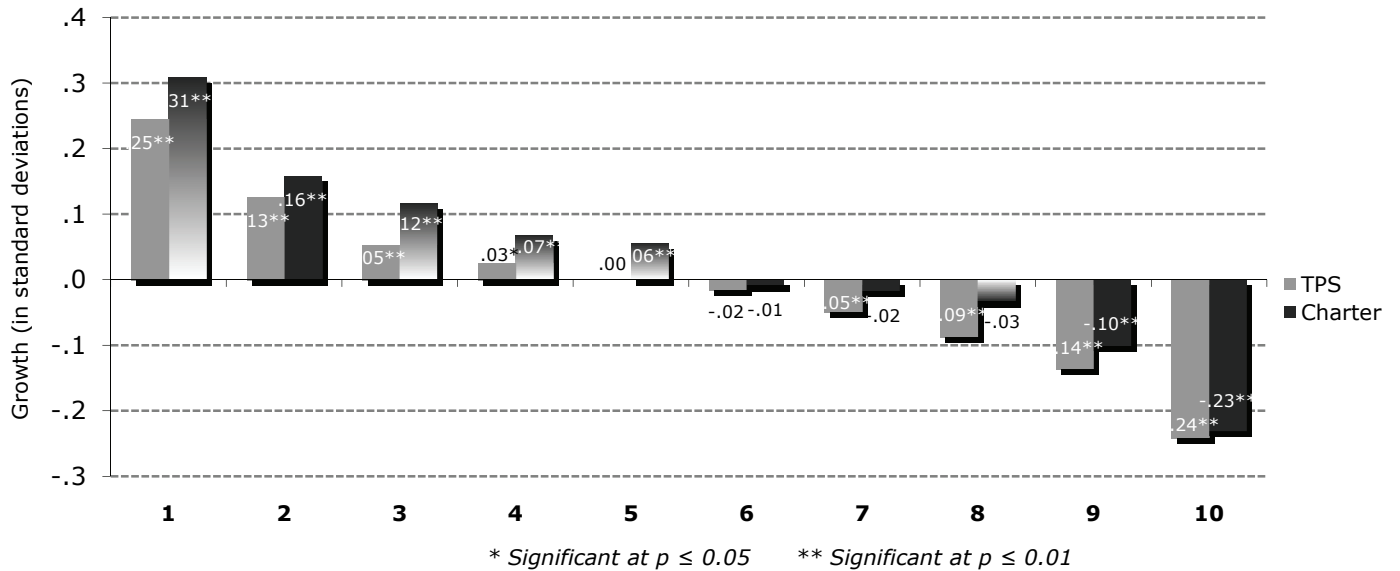
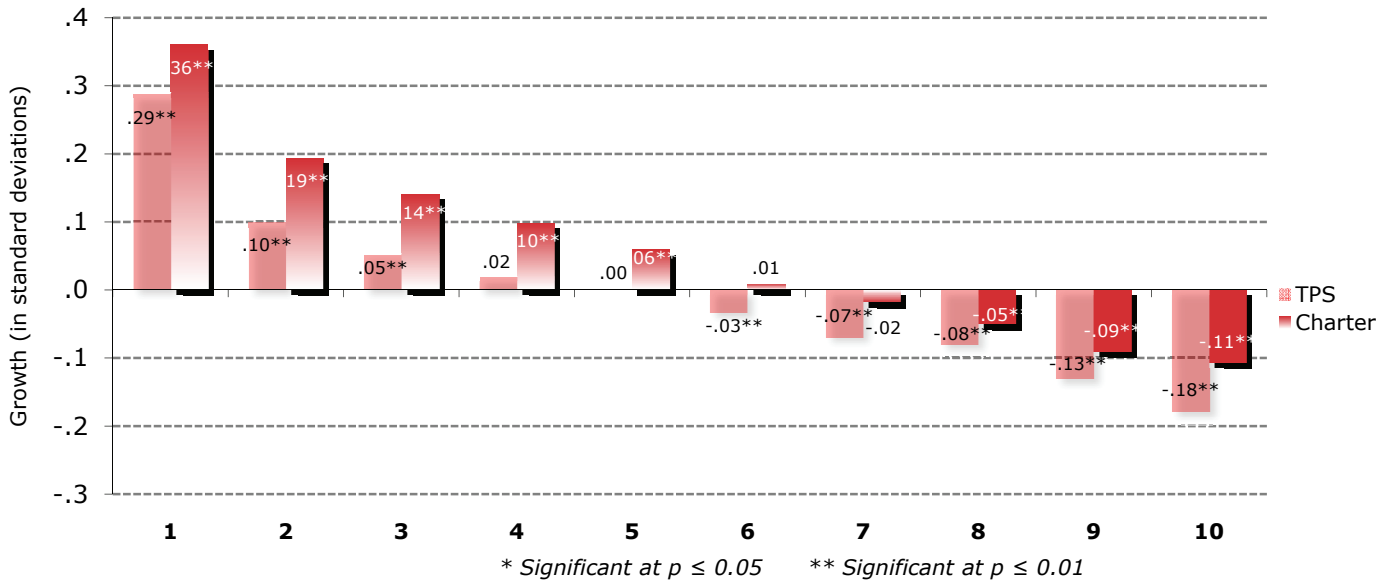


Figure 10.b: Impact by Students' Starting Decile - Math



Both figures demonstrate the expected “S”-shaped curve to the results. The overall curve reflects the typical pattern of larger learning gains for students with lower prior scores and larger learning losses for students with higher starting scores, a phenomenon known as “regression to the mean”. Here, the relative magnitudes are what is important: Do charter schools produce relatively better growth results than traditional public schools? If so, the charter curve would have larger gains on the low end and smaller losses on the high end of the distribution.

For students in Indiana, Figures 10.a and 10.b show that charter schools do better than traditional public schools in most respects. The effect of charter school attendance on growth results in both reading and math is mostly positive across the lower and middle deciles.

SUMMARY OF FINDINGS

This report covers academic growth at charter schools in Indiana over a four-year period. First, we look at growth at the school level and then by demography of students that attend charter schools. Overall, charter school growth in Indiana and Indianapolis outpaced the growth of traditional public schools. Looking at the distribution of school performance, 98% of the charter schools grew with similar or better rates than traditional public schools in reading and 100% of charter schools grew with similar or better rates in math compared to traditional public schools. Charter schools of all ages in Indiana on average grow at better rates than traditional public schools and charter school students grow at higher rates compared to their traditional public school peers in their first 2 years of enrollment in charter schools.

There was no significant difference in learning gains between charter school students and traditional public schools that are Hispanic in reading and math, but Black students in charter schools produce higher learning gains than Black students in traditional public schools. In fact, Black students in Indiana charter schools grow at similar rates to the average white student in a traditional public school in math. Charter school students in poverty also had learning gains better than their peers at traditional public schools in math as did charter school students that were retained a grade.

A summary of these findings can be found in Table 2, below.

**Table 2: Summary of Statistically Significant Findings for Indiana Charter Schools
Compared to the Average Learning Gain for VCR students in Feeder Schools**

	Reading	Math
Indiana Charter Students	✓	✓
Indianapolis Charter Students	✓	✓
First Year Enrolled in Charter School	✓	✓
Second Year Enrolled in Charter School	✓	✓
Third Year Enrolled in Charter School		
Charter Schools Age 1 – 2 Years	✓	✓
Charter Schools Age 3 – 4 Years	✓	✓
Charter Schools Age 5 – 6 Years	✓	✓
Black Charter School Students	✓	✓
Hispanic Charter School Students		
Free/Reduced Lunch Charter School Students		✓
Special Education Charter School Students		
English Language Learner Charter School Students		
Retained Charter School Students		✓