

Charter School Performance in Michigan

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Introduction

Across the country, charter schools occupy a growing position in the public education landscape. Heated debate has accompanied their existence since their start in Minnesota two decades ago. Similar debate has occurred in Michigan as well, with charter advocates extolling such benefits of the sector as expanding parental choice and introducing market-based competition to education. Little of that debate, however, is grounded in hard evidence about their impact on student outcomes. This report contributes to the discussion by providing evidence for charter students' performance in Michigan for six years of schooling, beginning with the 2005-2006 school year and concluding in 2010-2011.

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

This report provides an in-depth examination of the results for charter schools in Michigan. It is CREDO's first attempt to analyze the performance of Michigan's charter schools, as their data was not made available to us for inclusion in the CREDO national charter school study from 2009.¹ This report has three main benefits. First, it provides a rigorous and independent view of the performance of the state's charter schools. Second, the study design is consistent with CREDO's reports on charter school performance in other locations, making the results amenable to being benchmarked against those nationally and in other states. Thirdly, the study includes a section on the charter performance in the Detroit area, where much attention has been focused lately.

The analysis presented here takes two forms. We first present the findings about the effects of charter schools on student academic performance. These results are expressed in terms of the academic progress that a typical charter school student in Michigan would realize from a year of enrollment in a charter school. The second set of findings is presented at the school level. It is important to understand the range of performance at the school level since legislation and public policy work at this level. These findings look at the performance of students by school and present school average results.

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

Compared to the educational gains that charter students would have had in a traditional public school (TPS), the analysis shows that, on average, students in Michigan charter schools make larger learning gains in both reading and mathematics. Thirty-five percent of the charter schools have significantly more positive learning gains than their TPS counterparts in reading, while two percent of charter schools have significantly lower learning gains. In math, forty-two percent of the charter schools studied outperform their TPS peers and six percent perform worse. These findings position Michigan among the highest performing charter school states CREDO has studied to date.

Charter students in the city of Detroit (27% of the state's charter students), are performing even better than their peers in the rest of the state, on average gaining nearly three months achievement for each year they attend charter schools.

Study Approach

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

This statewide analysis uses the Virtual Control Record (VCR) methodology that has been used in previous CREDO publications.² The approach is a quasi-experimental study design with matched student records that are followed over time. "This analysis first answers the question on an aggregate state-wide level. Then, the general question is extended to consider whether the observed charter school performance is consistent when the charter school population is disaggregated along a number of dimensions, such as race/ethnicity, geographic location and so on. Answers to all these questions require that we ensure that the contribution of the schools – either the charter schools or the TPS schools – is isolated from other potentially confounding influences. For this reason, these analyses include an array

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

of other variables whose purpose is to prevent the estimate of the effect of charter schooling to be tainted by other effects. In its most basic form, the analysis includes controls for student characteristics: standardized starting score, race/ethnicity, special education and lunch program participation, English proficiency, grade level, and repeating a grade.

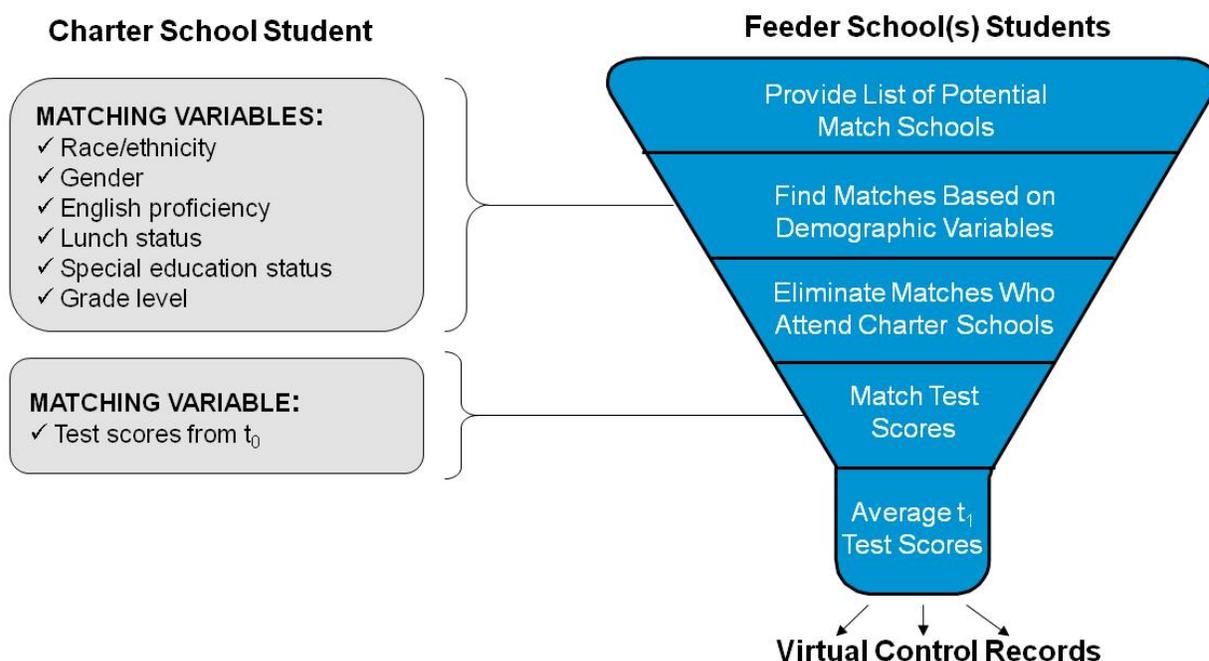
To create a reliable comparison group for our study, we attempted to build a VCR for each charter school student. A VCR is a synthesis of the actual academic experience of students who are identical to the charter school students, except for the fact that they attend a TPS that the charter school students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

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

Match factors include:

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

Figure 1: CREDO Virtual Control Record Methodology



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

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

With six years of student records in Michigan, it is possible to create five periods of academic growth. One growth period needs a "starting score", (i.e., the

achievement test result from the fall of one year) and a "subsequent score" (i.e., the test score from the following fall) to create a growth score. To simplify the presentation of results, each growth period is referred to by the year in which the second fall test score is obtained. For example, the growth period denoted "2008" covers academic growth that occurred between the end of the 2006-2007 and the end of the 2007-2008 school years. Similarly, the time period denoted "2011" corresponds to the year of growth between the 2009-2010 and 2010-2011 school years.³

With six years of data and six tested grades (3rd - 8th), there are 36 different sets of data each for reading and math; each subject-grade-year group of scores has slightly different mid-point averages and distributions. All test scores have been converted to "bell curve" standardized scores so that year-to-year computations of growth can be made.⁴

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

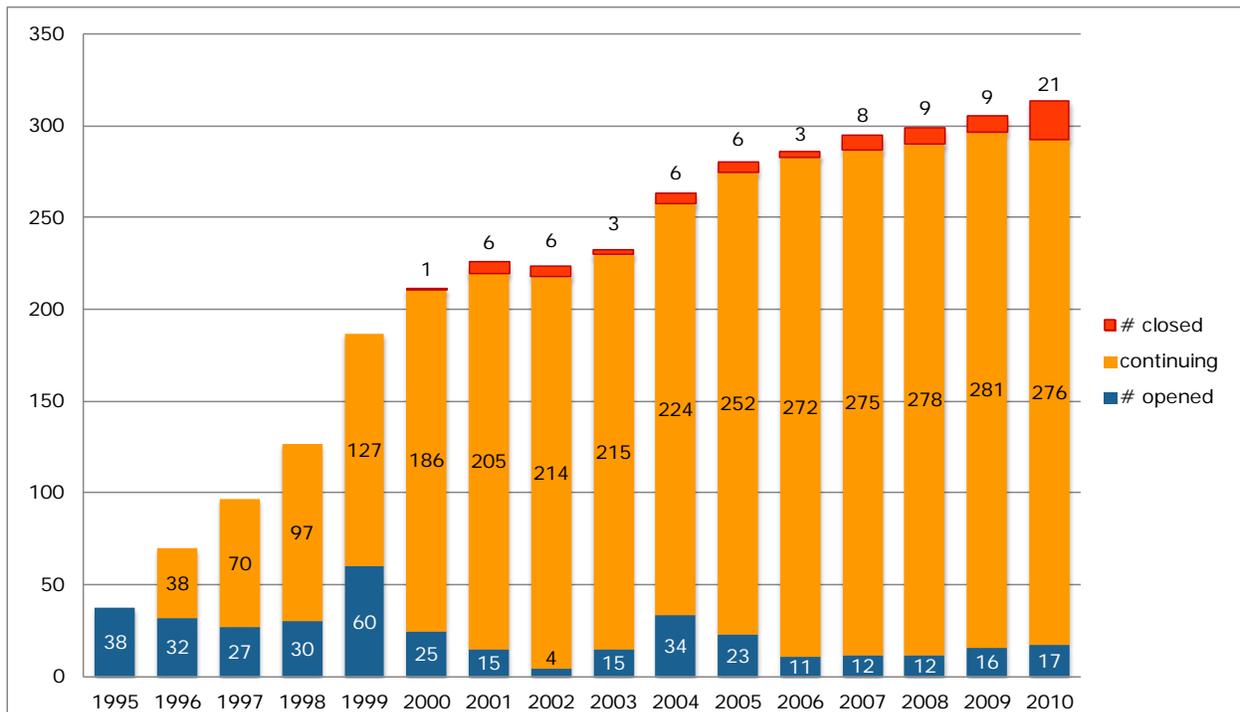
³ Fall exams reflect the achievement of the prior academic year, so we matched the fall scores to the school attended in the previous school year. For example, a student's fall 2007 exam score is attributed to the school attended in the 2006-2007 school year.

⁴ For each subject-grade-year set of scores, scores are centered around a standardized midpoint of zero, which corresponds to the actual average score of the test before transformation. Then each score of the original test is recast as a measure of deviation around that new score of zero, so that scores that fell below the original average score are expressed as negative numbers and those that were larger are given positive values. These new values are assigned so that in every subject-grade-year test, 68 percent of the former scores fall within a given distance, known as the standard deviation.

Michigan Charter School Demographics

The Michigan charter school sector has grown markedly since its inception in 1995. Figure 2 below notes the new, continuing and closed charter school campuses from the fall of 1995 to the fall of 2010.

Figure 2: Opened and Closed Charter Campuses, 1995-2010



According to the National Center for Education Statistics (NCES), there were 288 charter schools open in Michigan in the 2009-2010 school year.⁵ Because charter schools are able to choose their location, the demographics of the charter sector may not mirror that of the TPS sector as a whole. Furthermore, charter schools create a degree of sorting through their offer of different academic programs and alternate school models. In addition, parents and students who choose to attend charter schools select schools for a variety of reasons such as location, school safety, school size, academic focus or special interest programs. The cumulative result of all these forces is that the student populations at charters and their TPS feeders may differ. Table 1 below compares the student populations of all

⁵ This is the most recent year available from the NCES Common Core of Data Public School Universe.

Michigan’s traditional public schools, the charters’ feeder schools, and the charter schools themselves.

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

	TPS	Feeders	Charters
Number of Schools	3,579	1,289	297
Average enrollment per School	421	438	377
Total number of Students Enrolled	1,507,621	564,351	110,904
Greater Detroit Students	6%	11%	49%
Students in Poverty	43%	55%	70%
English Language Learners	3%	5%	5%
Special Education Students	11%	12%	9%
White Students	73%	64%	33%
Black Students	17%	25%	57%
Hispanic Students	5%	6%	6%
Asian/Pacific Islander Students	3%	3%	2%
Native American Students	0.9%	0.9%	0.8%

Nearly half of Michigan’s charter students are located in greater Detroit. For this reason alone, one would not expect charter school populations to parallel the demographics of the Michigan TPS population as a whole. Table 1 bears this out: charter schools have more students in poverty, more Black students and fewer White students than their TPS counterparts.

The feeder school populations would be expected to more closely align demographically, but even here there are significant differences. Charter schools enroll greater shares of Black students and students in poverty than the feeder schools.

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

The profile for English Language Learners shows that, in the aggregate, charter schools and their feeder schools enroll a larger share than do the TPS. This is likely due to the areas in which charter schools choose to operate.

Table 2: Demographic Composition of Charter Students in the Study

Student Group	All Charter Students Tested		Matched Charter Students	
	Number	Percent	Number	Percent
Michigan Charter Students	99,130		85,650	
% Matched	85,650	86%		
Black Students	55,504	56%	50,765	59%
Hispanic Students	6,380	6%	4,219	5%
White Students	32,558	33%	28,526	33%
Students in Poverty	66,592	67%	58,199	68%
Special Education Students	9,248	9%	6,162	7%
English Language Learners	4,471	5%	2,938	3%
Grade Repeating Students	4,501	5%	1,067	1%

NOTE: The appendix includes additional descriptive demographics.

For this analysis, a total of 85,650 charter school students (with 170,862 observations across 5 periods) from 273 charter schools are followed for as many years as data are available.⁶ The students are drawn from Grades 3 – 8 since these are the continuous grades that are covered by the state achievement testing program for reading and math⁷. An identical number of virtual comparison records are included in the analysis. In Michigan, it was possible to create virtual matches for 86 percent of the

A Roadmap to the Graphics

The graphics in this report have a common format.

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

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

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

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

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

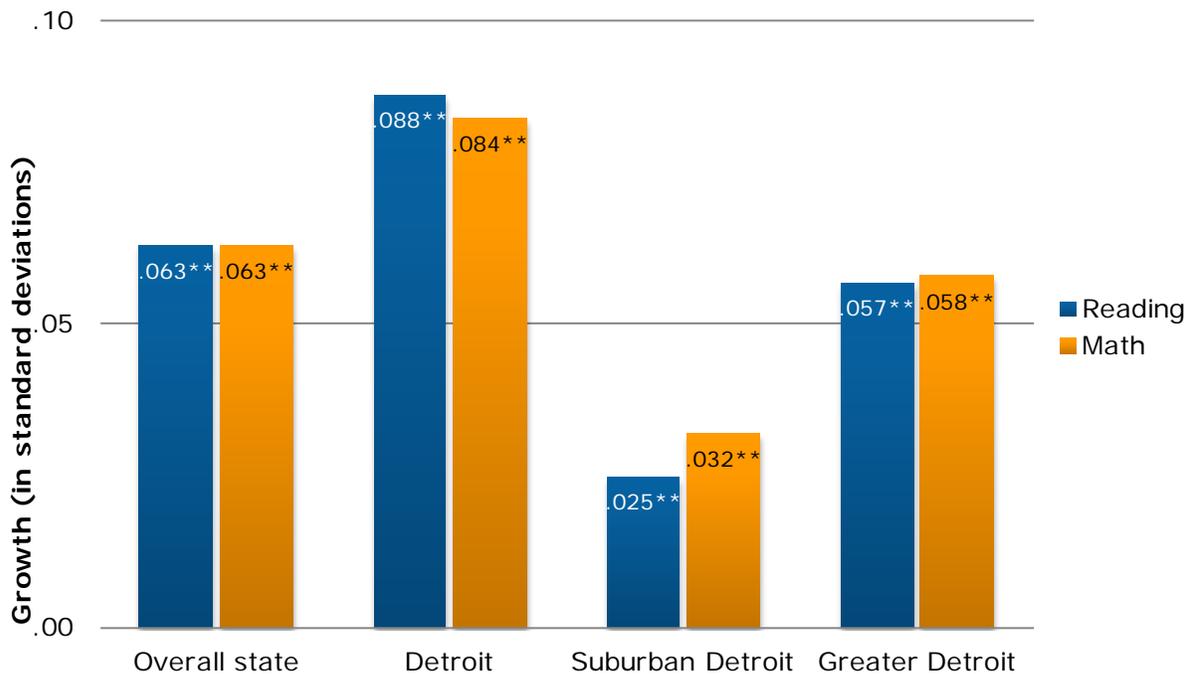
⁷ Testing data exists for only grade 11 in high schools, so no continuous growth could be measured.

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

Overall Charter School Impact

First, we examine whether charter schools differ overall from traditional public schools in how much their students learn, holding other factors constant. To answer this question, we average the pooled performance for all charter school students across all the growth periods and compare it with the same pooled performance of the VCRs. The result is a measure of the typical learning of charter school students in one year compared to their comparison VCR peers from the feeder schools nearby. The results appear in Figure 3. On average, students in Michigan charter schools learned significantly more than their virtual counterparts in reading and mathematics.

Figure 3: Average Learning Gains in Michigan Charter Schools, 2007-2011 Compared to Gains for VCR Students in Each Charter Schools' Feeder TPS



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

For this study, we distinguished between the city of Detroit, suburban Detroit (where many students who live in the city of Detroit attend school), and "Greater Detroit," which combines the two. It may be that the gains in Detroit itself may be the driving force for the gains in the charters in the state.

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

Table 3: Transformation of Average Learning Gains

Growth (in standard deviations)	Gain (in months of learning)
0.00	0.0
0.05	1.8
0.10	3.6
0.15	5.4
0.20	7.2
0.25	9.0
0.30	10.8
0.35	12.6

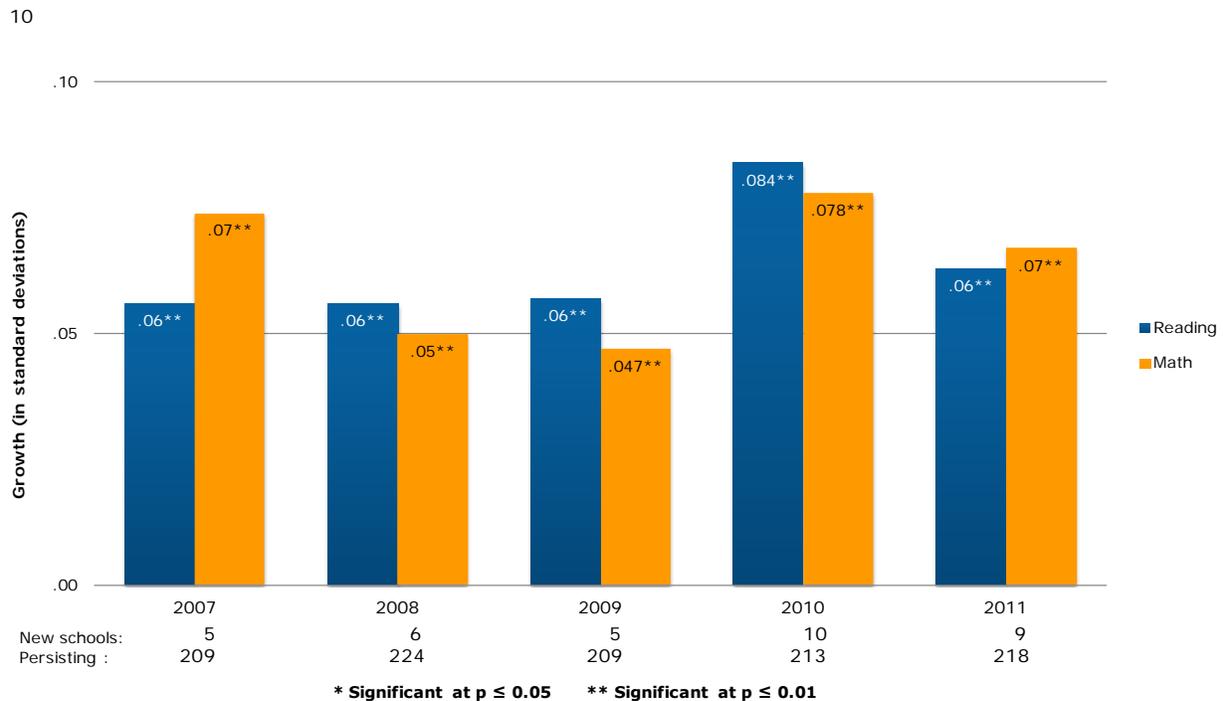
Using the results from Figure 3 and the transformations from Table 3, per year of schooling, we can see that, on average, charter students in Michigan gain an additional two months of learning in reading and math over their TPS counterparts. The charter students in Detroit gain over three months per year more than their counterparts at traditional public schools.

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

Charter School Impact by Growth Period

To determine whether performance remained consistent over all the periods of this study, the average charter school effects were disaggregated into the five growth periods. Results are shown in Figure 4 along with the number of newly opened and persisting schools for each year.

Figure 4: Impact by Growth Period, 2007-2011⁹



In both reading and math, charter students in Michigan learned significantly more than their virtual peers in all five periods analyzed. The increase observed between the 2009 and 2010 periods is due to the fact that the new schools that opened in that time period performed especially well. Another factor may be the highly dynamic market, as can be seen in Figure 2, with 94 charter schools opening and 55 closing between 2005 and 2010, creating a net positive stock of charter schools.

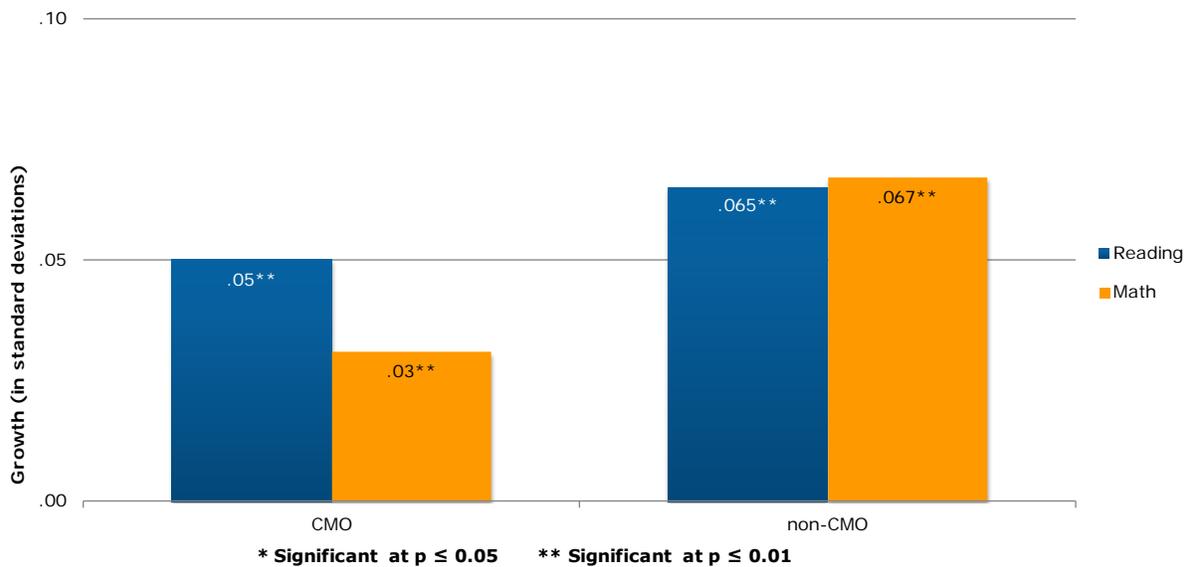
⁹ The graph tracks students starting in the fall of 2005, going through the spring of 2011.

¹⁰ Note: These numbers report only charters with tested students, so they are a subset of the counts on figure 2.

Charter School Impact by CMO and EMO Affiliation¹¹

The growth of charter management organizations (CMOs), which directly operate charter schools within a network of affiliated schools, has accelerated in recent years. Figure 5 below shows the charter impacts for students at schools that are part of a CMO and schools with no CMO affiliation.

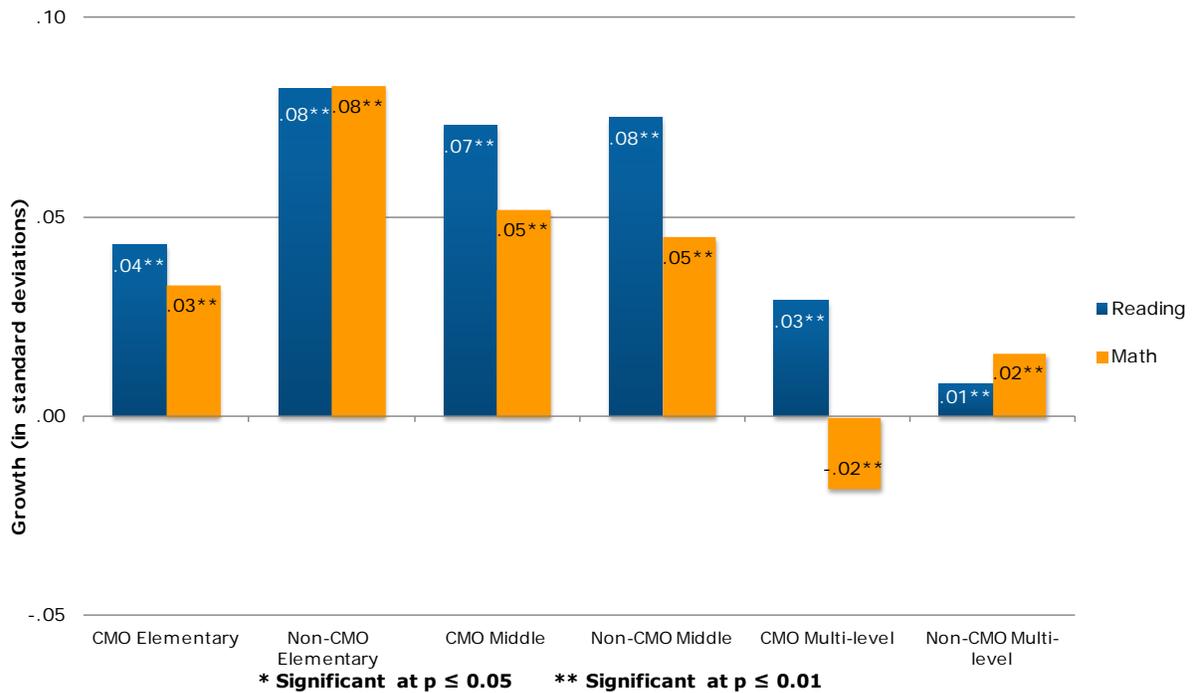
Figure 5: Impact by CMO Affiliation



The results show that students in charter schools have stronger growth in reading and math whether or not the charter school is affiliated with a CMO. The results for non-CMO-affiliates are significantly greater in both reading and math than the results for schools that are not part of a CMO. This appears to be primarily the influence of the elementary schools, as shown in Figure 5a.

¹¹ For the purposes of this study, CMOs and EMOs are defined as operating at least three schools.

Figure 5a: Impact by CMO Affiliation vs. Grade span



A different structural feature that influences student learning is whether the student attends a school that is operated under contract by an Education Management Organization (EMO). EMOs are organizations that contract with the governing boards of charter schools to provide staff, curriculum and other services. Because of the explicit contractual nature of the arrangement, one might expect the parties to have more explicit expectations for academic performance. In any case, it would be reasonable to expect EMOs to have heightened attention to academic success of the students they serve in order to maintain the relationship over time. Compared to other states, Michigan is unusual in that the CMO presence is much smaller compared to that of the EMOs, representing only 9% of the charter students vs. 50% in EMO schools. The performance of students in EMO schools is presented below.

Figure 5b: Impact by EMO Affiliation

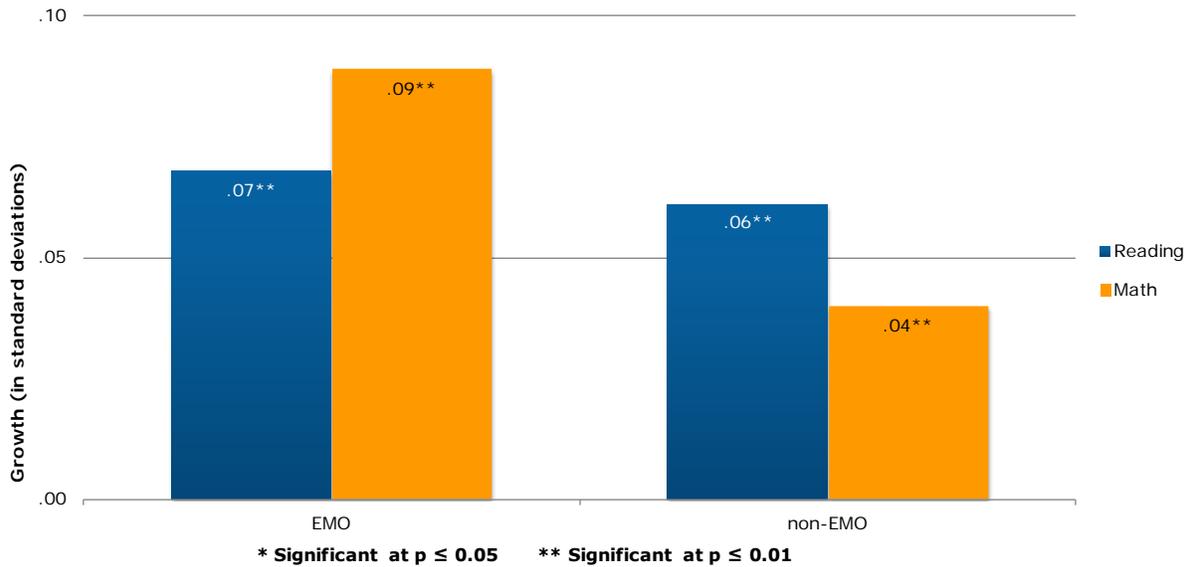
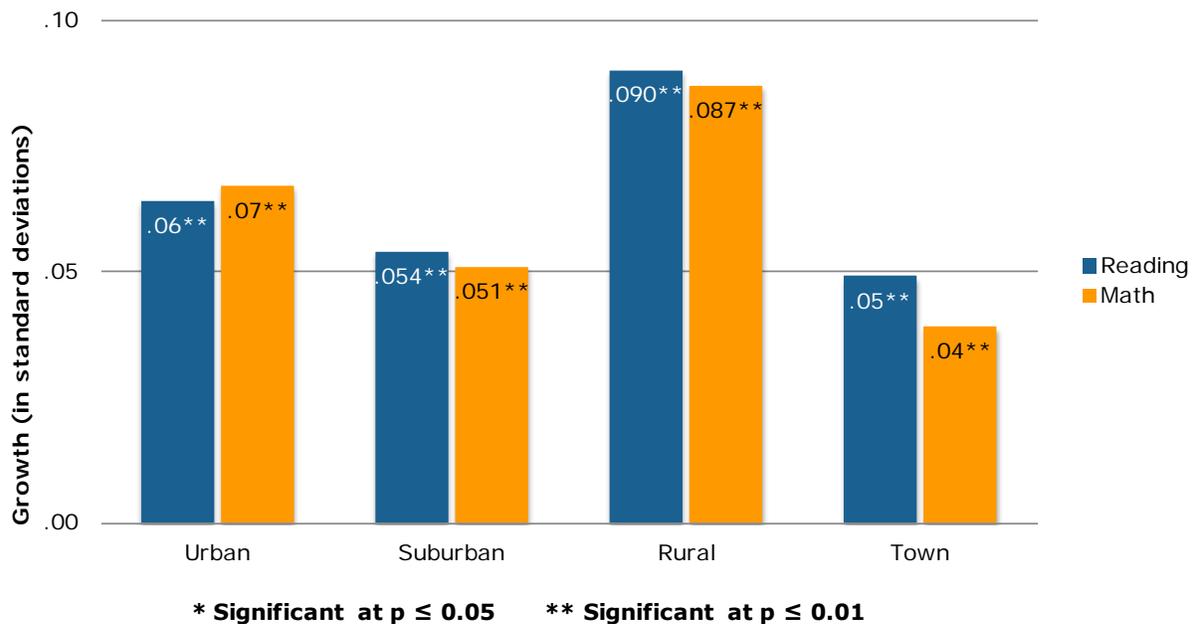


Figure 5b shows that in both reading and math, students who attend schools operated by EMOs post larger learning gains. The difference between EMO and non-EMO educated students is significant in reading and in math.

Charter School Impact by Location

Although charter schools in urban areas receive the bulk of media attention, charter schools can and do choose to serve in other locales. Differences in location may correlate to different average charter school effects. The results in Figure 6 represent the disaggregated impacts for urban, suburban, rural and town charter schools.

Figure 6: Impact by School Location



Students enrolled in charter schools in all types of communities in Michigan learn significantly more in both reading and math compared to their peers in TPS. Students in rural charter schools showed the biggest gains over their TPS peers in both reading and math.¹²

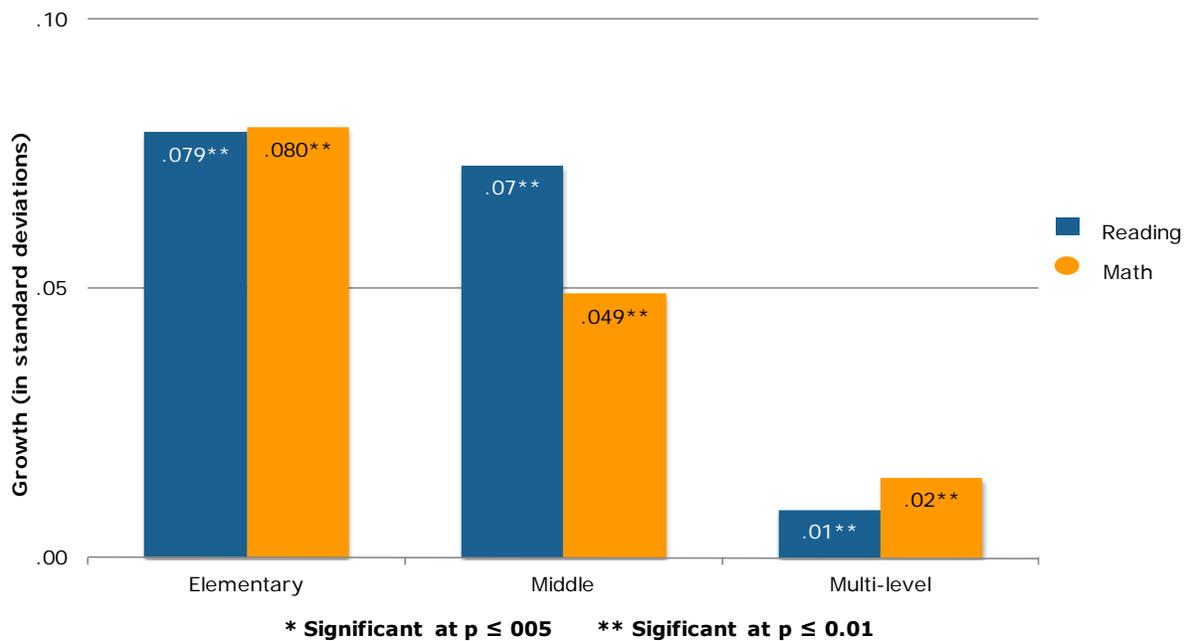
¹² Rural students make up only 11% of the state charter student population, so their performance is overshadowed by the students in the urban and suburban charter schools in the overall comparisons, Figure 3.

Charter School Impact by School Level

The flexibility and autonomy enjoyed by charter schools allow them to choose which grade levels to serve, with many charter operators deciding to focus on particular ages while others seek to serve a broader range of students. For example, 21% of Michigan charter schools are multi-level and serve grade ranges larger than traditional elementary, middle or high schools. The school levels are tracked by the National Center for Education Statistics, which allows us to disaggregate charter school impacts for different grade spans.

This study examined the outcomes of students enrolled in elementary, middle and multi-level schools. The results appear in Figure 7. Growth scores could not be calculated for high schools since testing data exists for only one grade level in that grade span (grade 11). End-of-course exams results were not available for this study, therefore, we are not able to estimate the effectiveness of high schools.

Figure 7: Impact by School Level



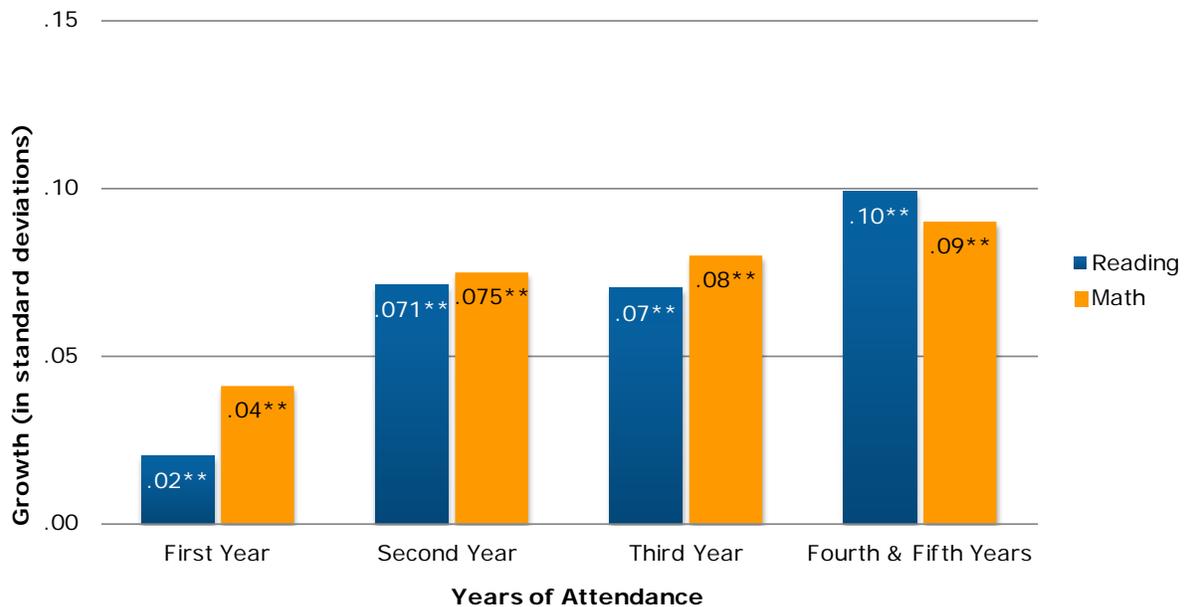
On average, charter students learn significantly more than their virtual counterparts in both reading and math regardless of the grade span served by the charter they attend. This is especially true for elementary schools (72% of the state's charter students) and middle schools (5% of state's charter students). Charter students in

elementary schools had a larger effect in both subjects. Students in multi-level schools had significantly stronger growth as well, but the increase was much smaller than for elementary and middle schools.

Charter School Impact by Students' Years of Enrollment

Student learning growth in charter schools may change as students continue their enrollment over time. To test this, students were grouped by the number of consecutive years they were enrolled in charter schools. In this scenario, the analysis is limited to the charter students who enrolled for the first time in a charter school between 2006-2007 and 2010-2011. 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. For this reason, the results of this analysis should not be contrasted with other findings in this report. This question examines whether the academic success of students who enroll in a charter school changes as they continue their enrollment in a charter school. The results are shown below in Figure 8.

Figure 8: Impact by Students' Years of Enrollment¹³



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

¹³ Due to natural aging out and transfer to other schools, the total # for the students enrolled four or five years is 1220.

The results suggest that new charter school students have an initial gain in reading and math compared to their counterparts in traditional public schools. There is a steady gain in learning the longer the students are enrolled in charter schools.

These findings reinforce the overall charter school impacts, and show that students in Michigan charter schools reap additional months of learning on a consistent basis as they continue their enrollment.

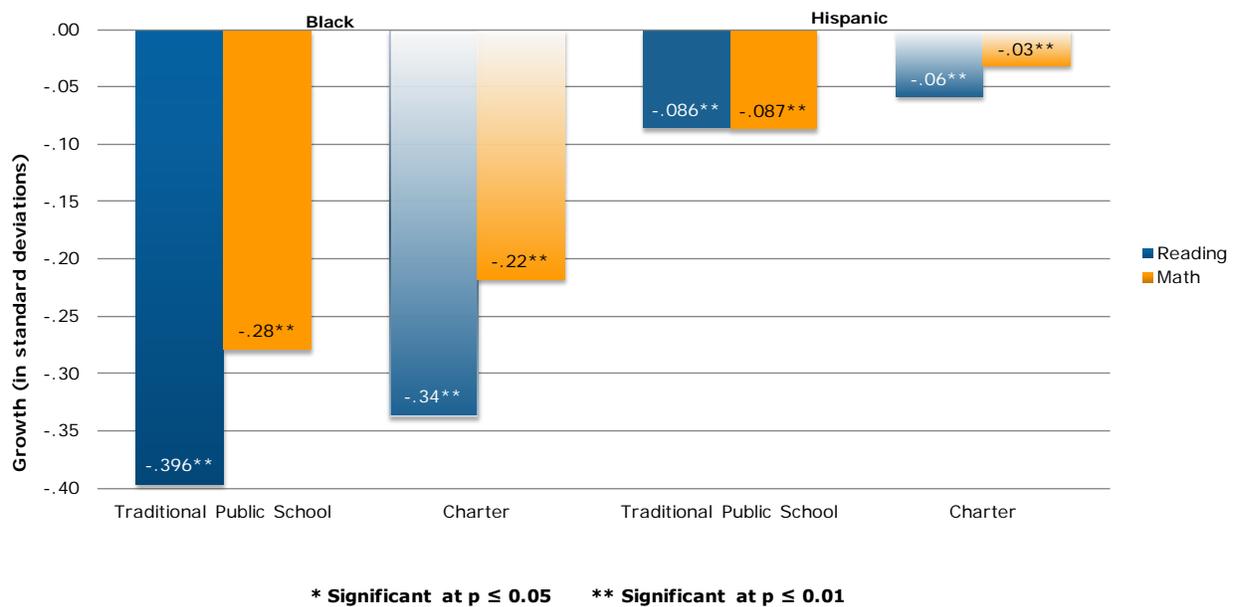
Charter School Impact by Race/Ethnicity

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

The graph displays two distinct comparisons, described below:

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

Figure 9: Impact by Black and Hispanic Students



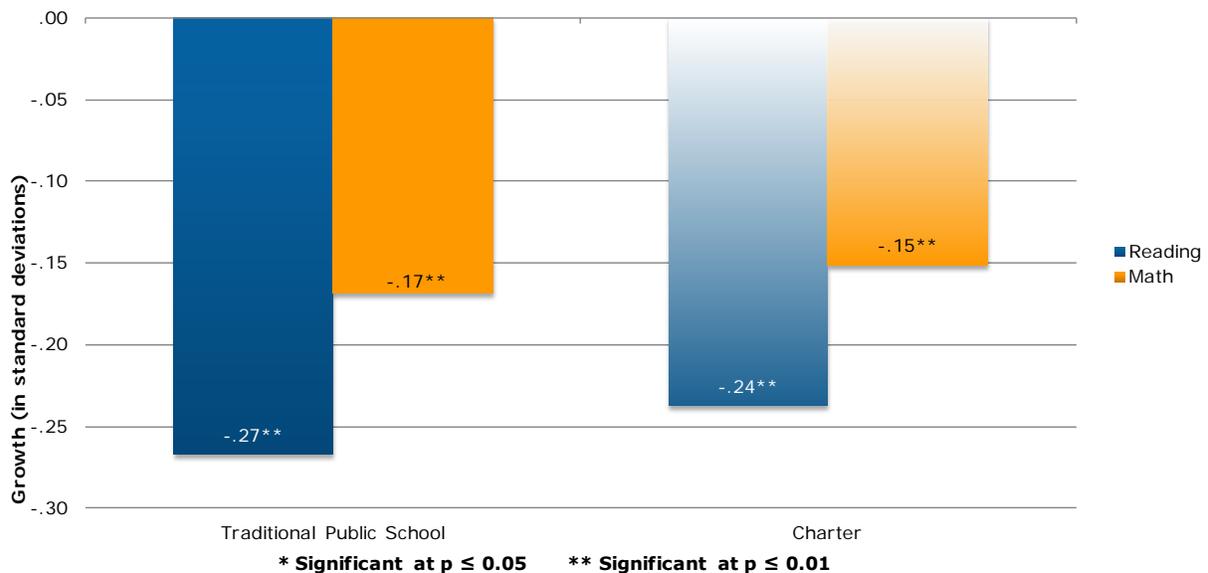
While on average Black students in both TPS and charter schools have significantly smaller learning gains in reading and math than those of average White students in TPS, the baseline of comparison, Black students enrolled in charter schools show significantly better performance in reading and math compared to Black students in TPS. In the figure above, the significance of differences between minority charter and minority TPS students are designated by the frosted bars.

Hispanic students in both TPS and charter schools also have gains in math and reading that are smaller than those of white students in TPS, the baseline of comparison. In both reading and math, Hispanic students in charter schools perform significantly better than Hispanic students in TPS (again, as represented by the shading of the charter school bars for Hispanic students.)

Charter School Impact with Students in Poverty

Much of the motivation for developing charter schools aims at improving education outcomes for students in poverty. The enrollment profiles of charter schools across the country underscore this fact; in Michigan, 70 percent of charter students are eligible for subsidized school meals, a proxy for low income households. Thus, the impact of charter schools on the learning of students in poverty is important both in terms of student outcomes, and as a test of the commitment of charter school leaders and teachers to address the needs of this population. Figure 10 presents the results for students in poverty. In this graph, the comparison student is a student who is eligible for subsidized school meals in TPS.

Figure 10: Impact with Students in Poverty



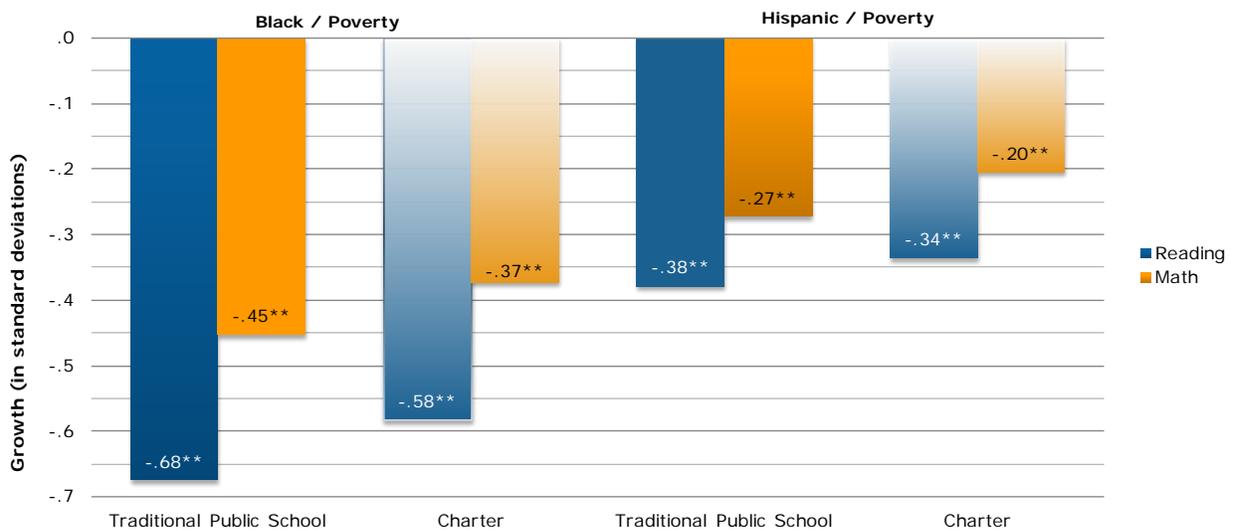
As shown in the figure above, in Michigan, students in poverty perform significantly worse than their non-poverty peers regardless of whether they attend a TPS or a charter. However, students in poverty have comparatively stronger growth if enrolled in charter schools.

Charter School Impact by Race/Ethnicity and Poverty

The most academically needy students in public education are those who are both living in poverty and are a racial or ethnic minority that has been historically underserved. These students represent the most challenging subgroup, and their case has been the focus of decades of attention. This group receives particular attention within the national charter school community.

The impact of charter schools on the academic gains of Black students living in poverty and Hispanic students living in poverty is presented in Figure 11 below.

Figure 11: Impact with Black and Hispanic Students in Poverty



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

Black students in poverty who are enrolled in charter schools show significantly better performance in reading and math compared to Black students in poverty in TPS. However, the stronger growth of poor Black students attending charter schools is not enough to offset the lower values compared to White TPS students.

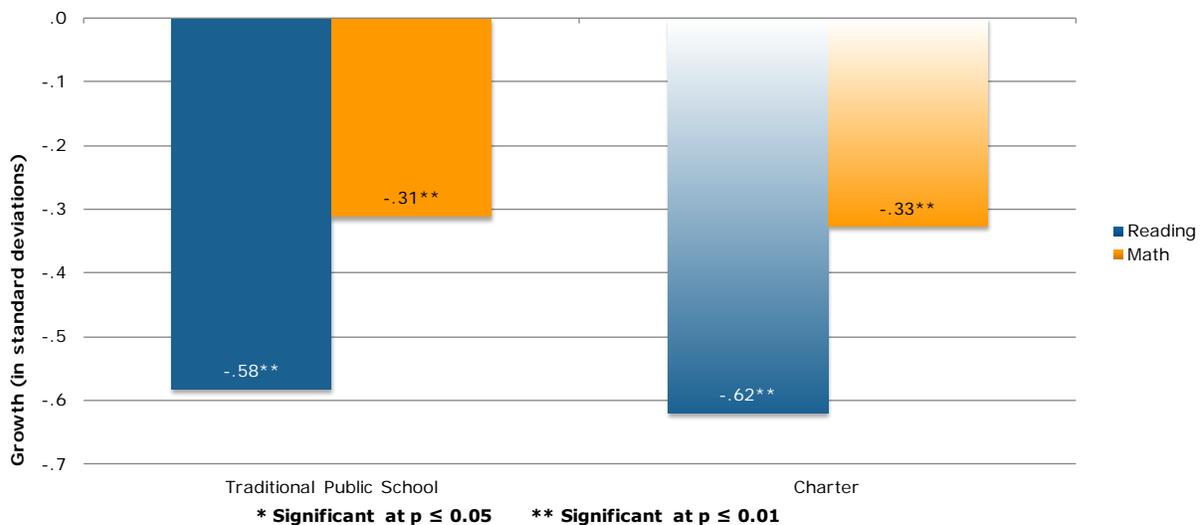
As above, Hispanic students in poverty attending charter schools have significantly stronger growth than Hispanic students in poverty who attend TPS schools, but even the stronger growth of these charter school students is still significantly weaker than TPS non-poverty White students.

Charter School Impact with Special Education Students

The demographic comparisons in the CREDO national charter school report released in 2009 indicated that across the charter sector, schools serve fewer Special Education students than the traditional public schools both in number of students and as a proportion of their enrollment. In some cases, this is a deliberate and coordinated response with local districts, based on a balance of meeting the needs of the students and a consideration of cost-effective strategies for doing so. In Michigan, the overall proportion of charter school students who are classified as Special Education is 9 percent, compared to 11 percent in TPS statewide and 12 percent in the charter schools' feeder schools. The difference in proportions of enrolled Special Education students is smaller in Michigan than in many other states. Anecdotal evidence suggests that TPS and charters may differ in their criteria for designating students as needing to be assessed for special education services; this topic has been flagged for future study on student enrollments.

The results are presented in Figure 12 below.

Figure 12: Impact with Special Education Students



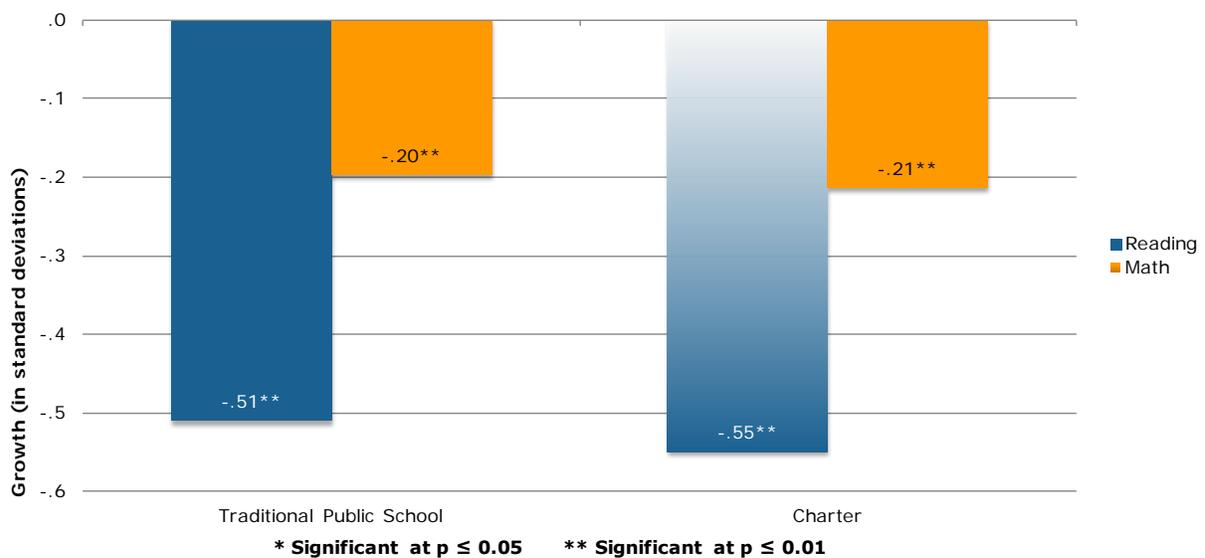
Special Education students enrolled in both TPS and charter schools have significantly smaller gains than students not receiving special education services. In charter schools in Michigan, Special Education students' gains are significantly smaller in both reading and math than their counterparts in TPS.

Charter School Impact with English Language Learners

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

The comparison of learning gains of charter school English Language Learners and their TPS counterparts appears in Figure 13. The baseline of comparison is the typical learning gains of the comparison peers in traditional public schools who are proficient in English.

Figure 13: Impact with English Language Learners



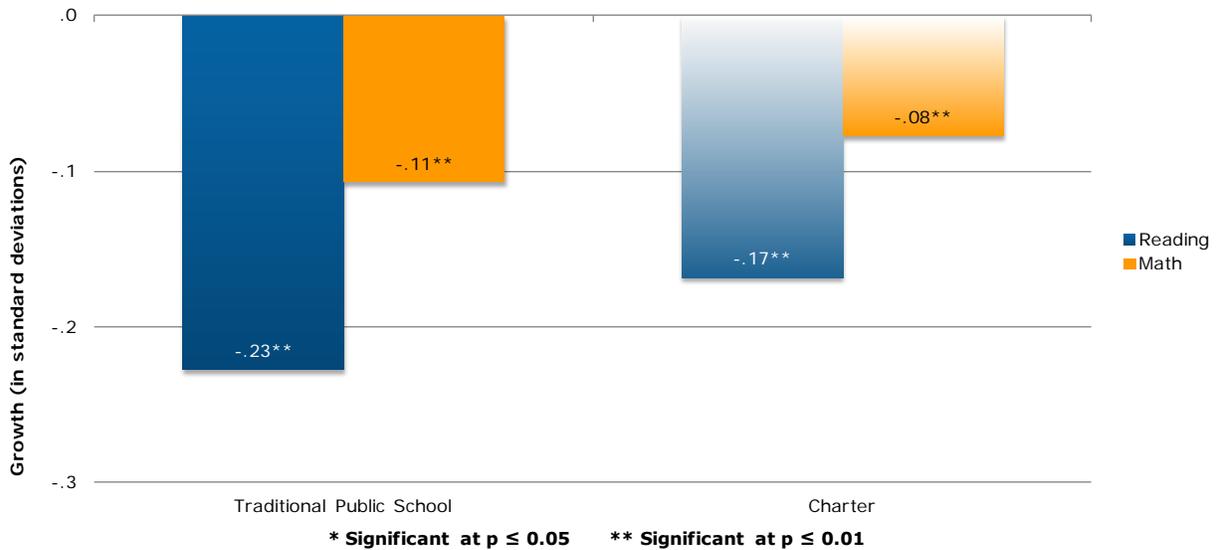
As has been found in other studies, Michigan English Language Learner students in both TPS and charter schools learn significantly less than native/fluent English speakers. This was true in both reading and math. The larger difference in reading performance directly relates to the acquisition of language, whereas learning in math is more conceptual and language-neutral. Charter students' gains are significantly less than TPS students in reading, and have equivalent learning in math.

Charter School Impact with Grade-Repeating Students

This analysis examined the outcomes of students who were retained.

Retention practices differ widely across the country and between the charter and TPS sectors. The fact that retained charter students have the lowest match rate (20 percent) of any subgroup in our study suggests that charter schools are more likely to retain academically low-performing students. The results of learning gains following retention appear in Figure 14.

Figure 14: Impact with Grade-Repeating Students



Retained students included in the analysis had weaker growth than non-retained students in both TPS and charter schools in reading and math. However, the retained students at charter schools had significantly larger growth in both subjects than their counterparts who attended traditional public schools.

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. Furthermore, many charter schools, including several in Michigan, have as part of their mission a specific emphasis on serving students who have not thrived academically in TPS and whose early performance is well

below average. We examined the performance of charter schools to see if they produced equivalent results across the spectrum of student starting points and in relation to the results observed for equivalent students in TPS.

To do this, for charter school students and their VCRs, their baseline achievement test scores in reading and math were disaggregated into deciles. In this analysis, the base of comparison is the average academic growth of the TPS students in Decile 5, which corresponds to students in the 50th to 60th percentiles in the state. Student achievement growth in each decile for charter school students and their VCRs was then compared. The results appear in Figures 15 and 16 below.

Figure 15: Impact by Students' Starting Decile – Reading

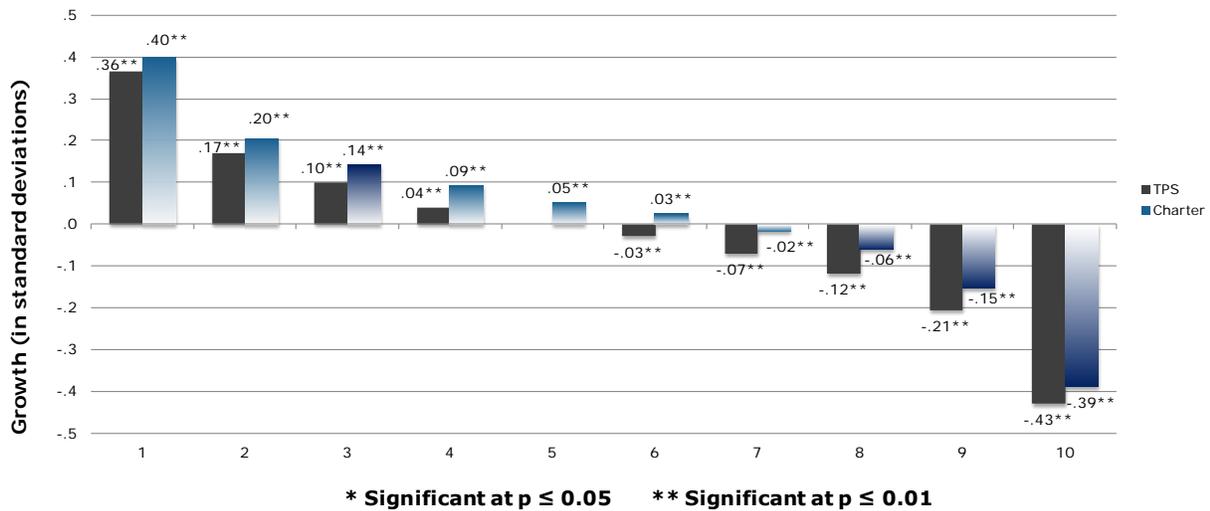
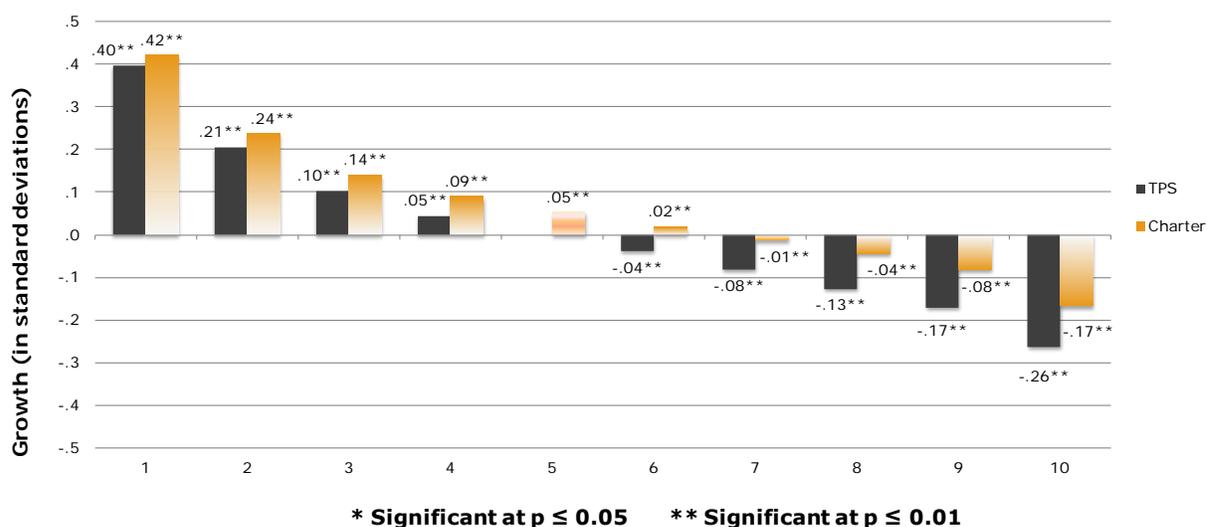


Figure 16: Impact by Students' Starting Decile – Math



Both figures demonstrate the expected “S”-shaped curve for 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 magnitude is what’s important: Do charter schools produce relatively better growth results than TPS? If so, the charter curve would have larger gains on the low end and smaller losses on the high end of the distribution. For students in Michigan, Figures 15 and 16 show that charter schools do better than TPS across the deciles in both reading and math. They move low-performing students ahead with larger gains, and preserve more of the learning for high-performing students.

School-level Analysis

Comparative School-level Quality The numbers reported above represent the average learning gains for charter school students across the state; however, the pooled average effects tell only part of the story. Parents and policymakers are also interested in school-level performance. Parents make choices about enrolling their children based on school-level factors, one of which is performance. And policy makers who are interested in the quality of education also need to know about the distribution of quality across the range of schools.

In order to determine the current distribution of charter school performance, the academic growth of students over the two most recent growth periods (2010 and 2011) is aggregated to the school level and an average learning gain is derived. These school-wide averages allow us to compare the effect of charter schools on

student learning to the experience the students would have realized in their local traditional public schools.¹⁴ The performance of the VCR students associated with each charter school comprises this measure of the local educational market. This analysis isolates the average contribution to student learning gains for each charter school. This measure is called the school's effect size, and is expressed in standard deviations of growth.

As noted in Table 1, charter schools are generally smaller than their corresponding feeder schools. In addition, some charter schools elect to open with a single grade and mature one grade at a time. Consequently, care is needed when making school-level comparisons to ensure that the number of tested students in a school is sufficient to provide a fair test of the school impact. Our criteria for including a school in this analysis was for the school to have at least 60 matched charter student records over the two years, or at least 30 matched charter records for new schools with only one year of data. Of the sample of 269 Michigan charter schools with test scores in 2010 and 2011 for reading, 61 schools had an insufficient number of individual student records to calculate a representative school-wide average growth score. As a result, the final school sample for reading has 208 charter schools and their corresponding TPS comparisons. For math, 61 of 273 charter schools had too few student records to be representative of the school, resulting in a sample of 212 charter schools with an equal number of comparison TPS schools.

For reading, the school effect size ranged from a low of -0.14 standard deviations of growth to a high of 0.41. The gap between the lowest and highest effect sizes for charter schools was larger in math; they were -0.23 and 0.36, respectively. It is important to emphasize that these effect size measures represent an average for each school; within each school, individual students will have learning gains that distribute around the school average. This point is especially pertinent when the effect size for a school is negative.

Table 4 below shows the breakout of performance for the Michigan charter schools that qualified for the analysis.

¹⁴ We chose to include only the two most recent growth periods in this analysis for two reasons. First, we wanted a highly relevant contemporary distribution of charter school performance. Second, using only two periods of data ensured that all schools' effect sizes were measured fairly; they are all based on one or two periods of data instead of one period for some schools and four periods for others.

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

Subject	Significantly Worse		Not Significant		Significantly Better	
	Number	Percent	Number	Percent	Number	Percent
Reading	4	2%	131	63%	73	35%
Math	12	6%	112	53%	88	42%

In reading, 73 of 208 (35%) of charter schools perform significantly better than their traditional public school market, while 42% perform significantly better in math. Both of these results are better than the 2009 national average proportion of better-performing charters, which was 17%.¹⁵ Equally noteworthy is the small proportion of Michigan charter schools whose performance is significantly worse than their TPS counterparts: only 2% of schools have reading gains that are worse, and only 6% have significantly inferior math gains. These percentages are also better than those reported in the 2009 national report. A larger proportion of Michigan charter schools were not significantly different from their market in reading than in math.

¹⁵ CREDO. *Multiple Choice: Charter School Performance in 16 States* (2009). <http://credo.stanford.edu>.



Impact of Growth on Achievement

While the impacts of charter schools on academic growth relative to their local competitors is instructive, the most important aspect of growth relates to how well students are being prepared. Because many of the students served by charter schools start at low levels of achievement, it is vital to understand how well their academic growth advances their absolute achievement. Each school's average growth is associated with their average achievement level, which is compared to the rest of the state. The results appear in Tables 5 and 6 below. For growth, we use the effect sizes discussed above. The school's average achievement level is the mean achievement of the students over the same two periods covered by the effect size (2010 and 2011).¹⁶ The 50th percentile indicates statewide average performance for all public school students (traditional and charter). A school achievement level above the 50th percentile indicates that the school performs above the statewide average.

A Note about Tables 5 and 6

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

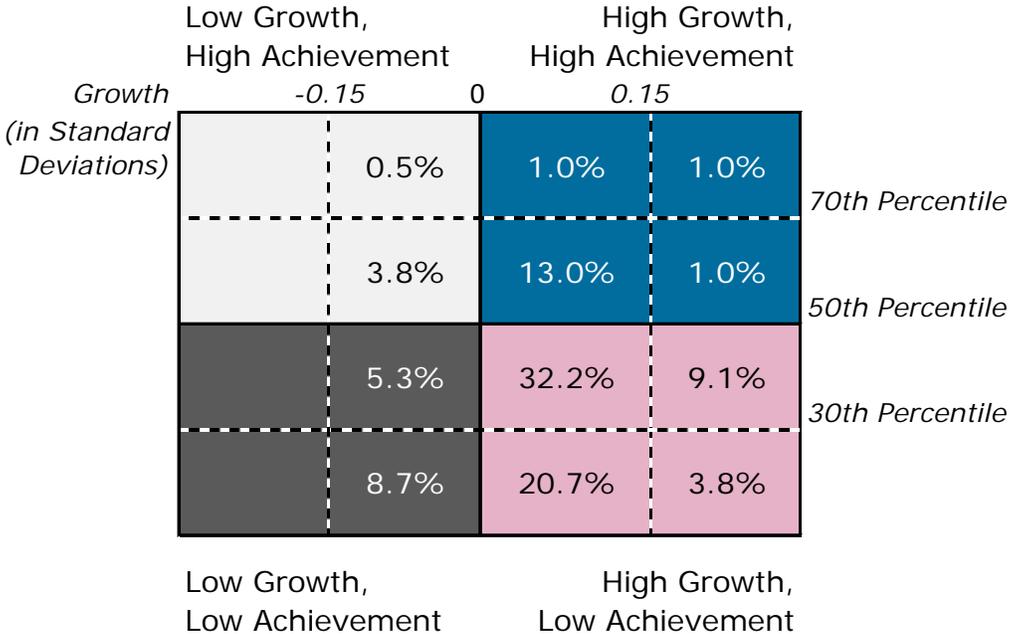
The uppermost box on the left denotes the percentage of charters with very low average growth but very high average achievement. The box in the bottom left corner is for low-growth, low-achieving schools.

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

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

¹⁶ Average achievement was computed using students' z-scores from the end of the growth period (e.g., spring 2010 and spring 2011), and the resulting school-level mean was then converted into a percentile.

Table 5: Reading Growth and Achievement



In Michigan, 170 of 208 charter schools (about 82 percent) had positive average growth in reading, regardless of their average achievement. (This percentage is the sum of the squares in the two right quadrants.) About 16 percent of charters had positive growth and average achievement above the 50th percentile of the state (i.e., the total for the blue quadrant on the top right). About 80 percent of charters perform below the 50th percentile of achievement (the sum of the two bottom quadrants). Of concern are the 29 schools (14 percent of charters) in the gray bottom left quadrant, which represents low growth and low achievement.

Table 6: Math Growth and Achievement

Growth (in Standard Deviations)	Low Growth, High Achievement		High Growth, High Achievement		
	-0.15	0	0.15		
	0.5%	0.9%	0.5%		70th Percentile
	2.4%	8.0%	3.8%		50th Percentile
	15.1%	21.7%	11.8%		30th Percentile
	1.4%	8.5%	20.3%	5.2%	
	Low Growth, Low Achievement		High Growth, Low Achievement		

For math, 153 of 212 charter schools (72 percent) had positive average growth, as seen in the two right quadrants. Thirteen percent of charters had positive growth and average achievement above the 50th percentile (the top right orange quadrant). About 84 percent of charters have achievement results below the 50th percentile of the state (the sum of the two bottom quadrants). More than half of Michigan charters have positive growth and achievement below the 50th percentile in the state, as seen in the bottom right pink quadrant. If those schools continue their trends of positive academic growth, their achievement would be expected to rise over time.

Detroit

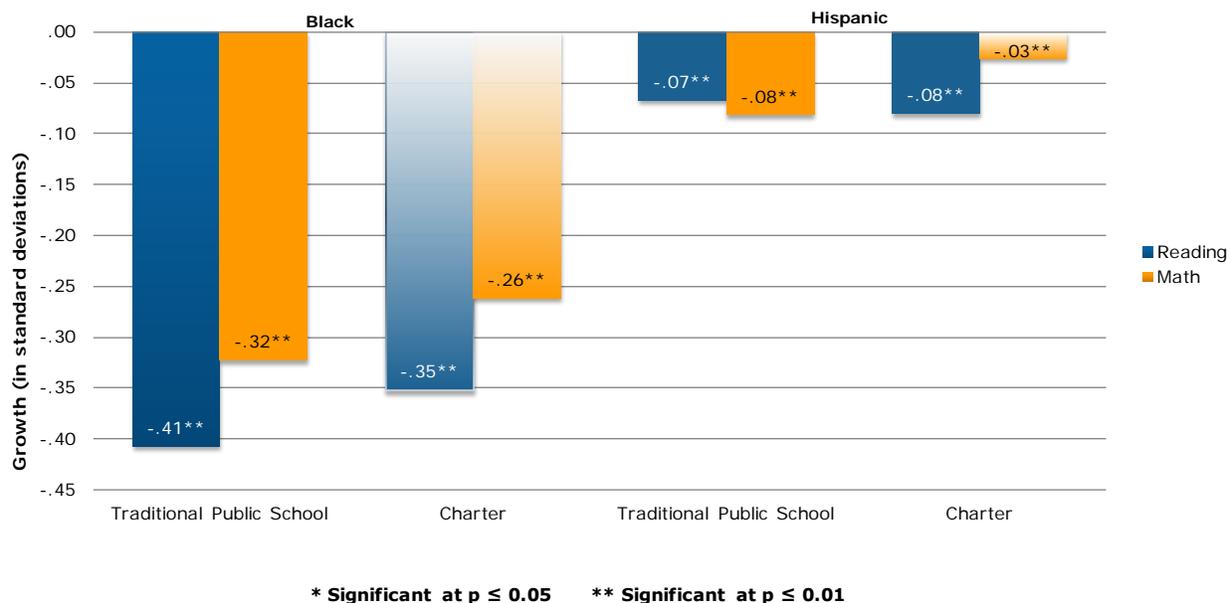
Due to the statewide focus on school quality in Detroit, in this section we delve more deeply into charter school performance there, where more than 27 percent of Michigan charter students attend school. In recent years, many students from Detroit have begun attending charter schools in the suburban areas surrounding the city, so we have included these charter schools in the analyses in this section.

As with the earlier statewide graphs, each graph in this section displays two distinct comparisons:

- The first comparison displays the performance of Detroit TPS and charter students in the subgroup of interest relative to the "average statewide student in TPS." The values that appear in each vertical bar indicate the magnitude of difference from this comparison student, and the stars indicate the level of statistical significance. Thus, if there is no difference in the learning gains, the bar would be missing entirely; if the learning of the Detroit student group in question is not as great as the statewide 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 Detroit charter school student subgroup differs significantly from their peers in the same student subgroup in Detroit traditional public schools. Where the difference is significant, the charter school bar has gradient shading.

Impact by Black and Hispanic Students Eighty percent of tested Detroit charter students are Black and about five percent are Hispanic, making these two historically underserved groups the majority student populations in the city's charter schools. The impact of charter schools on the academic gains for Black and Hispanic students in Detroit are in Figure 17 below.

Figure 17: Impact by Black and Hispanic Students in Detroit

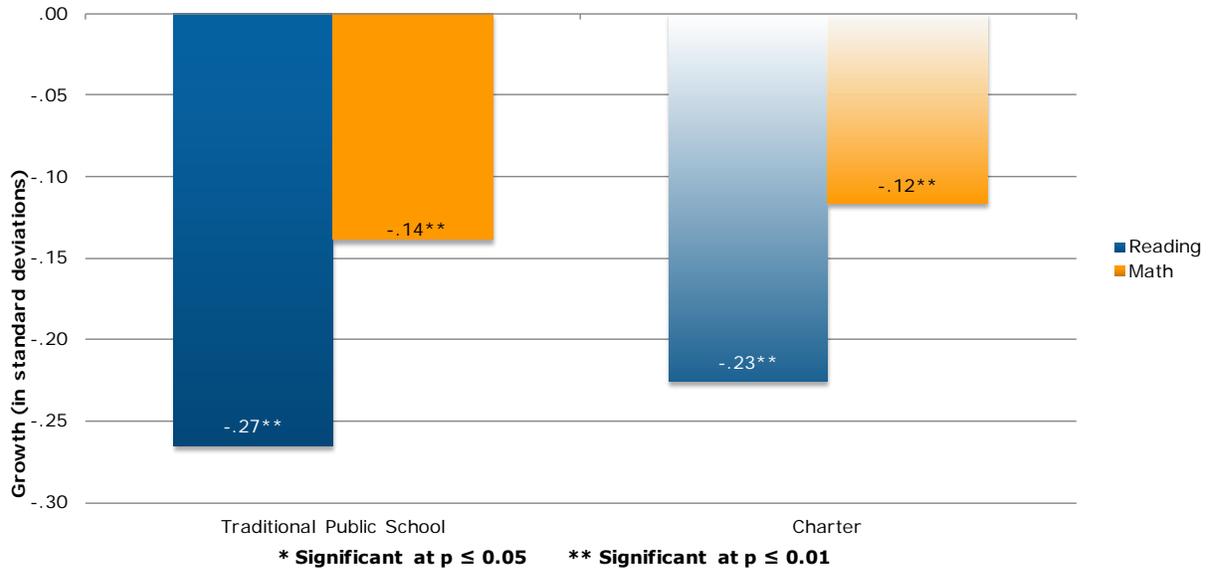


Detroit’s Black students have smaller learning gains in reading and math than those of White students in traditional public schools. Black students’ learning gains were smaller regardless of the type of school they attend. In both reading and math, Black students in Detroit charter schools have significantly larger growth compared to Black students in Detroit TPS.

Even though the gap is not as large, Hispanic students in both traditional public and charter schools in Detroit also have smaller rates of growth in reading and math than the average White student statewide in traditional public schools. However, Hispanic charter students in Detroit show significantly better outcomes in math compared to their Hispanic TPS counterparts in Detroit. There is no difference in reading learning gains for Hispanic charter students and Hispanic TPS students in Detroit.

Impact by Students in Poverty In addition to Black and Hispanic students, another historically underserved group, students in poverty, comprises 78 percent of the Detroit charter school population. Results for students in poverty are shown in Figure 18 below.

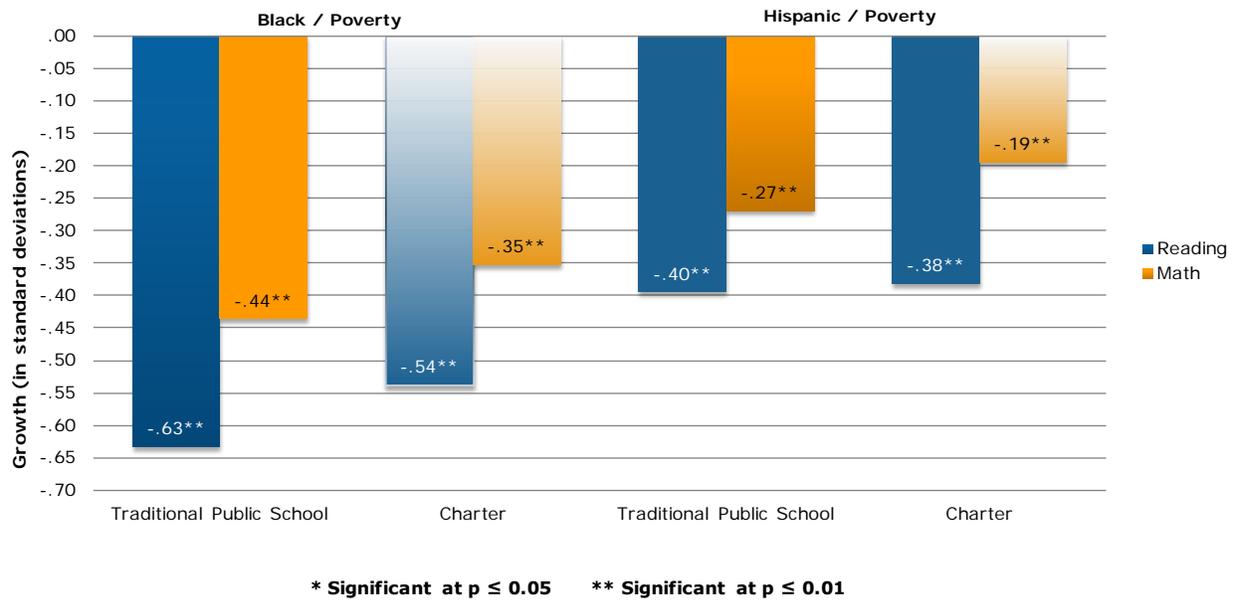
Figure 18: Impact by Students in Poverty in Detroit



Results for Detroit students in poverty were similar to the state results. Students in poverty grow at a rate that is significantly worse than their non-poverty peers statewide. Figure 18 shows Detroit students in poverty enrolled in charter schools receive significant benefits in learning gains in both reading and math as compared to Detroit students in poverty attending TPS. However, it bears noting that the magnitude of the differences for both subjects is modest.

Impact by Race/Ethnicity and Poverty In Detroit, 60 percent of students are Black and living in poverty, while 4 percent are Hispanic and living in poverty, making charter schools' impact with these students extremely important. The impact of Detroit charter schools on the academic gains of Black students living in poverty and Hispanic students living in poverty is presented in Figure 19 below.

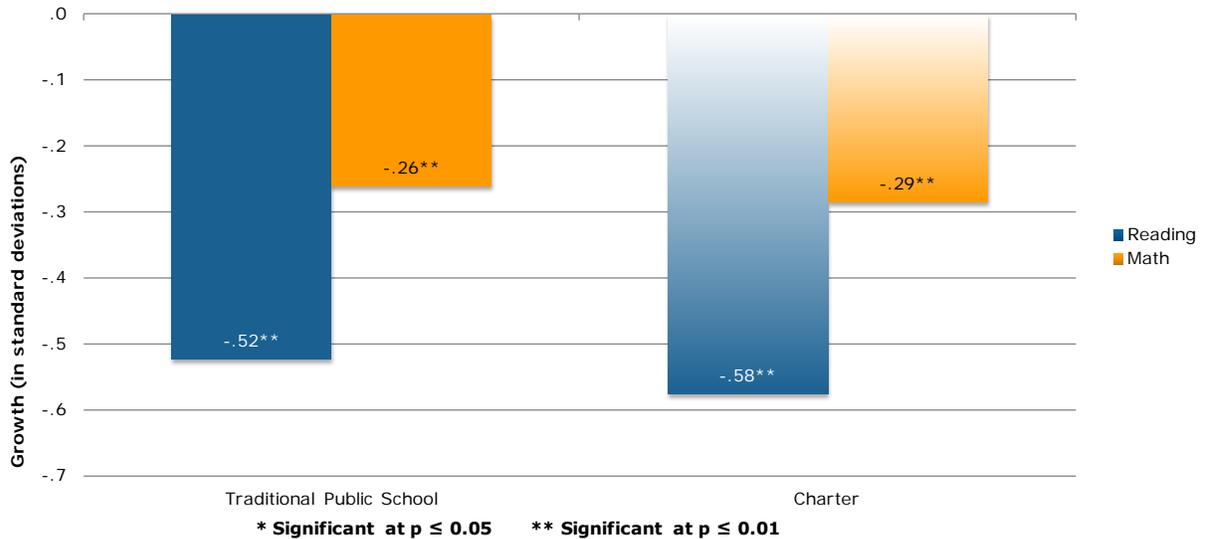
Figure 19: Impact by Detroit Black and Hispanic Students in Poverty



Detroit’s Black and Hispanic students in poverty have smaller gains in reading and math than White TPS students statewide. This remains true whether students attend TPS or charter schools. Black students in poverty who are enrolled in Detroit charter schools did show significantly better performance in reading and math compared to Black students in poverty in Detroit TPS. Hispanic charter students in poverty show larger gains in math than Hispanic students in Detroit TPS, but there were no statistical differences in reading between charter and TPS Hispanic students in poverty.

Impact with Special Education Students The results for Detroit students who receive special education services are shown in Figure 20 below.

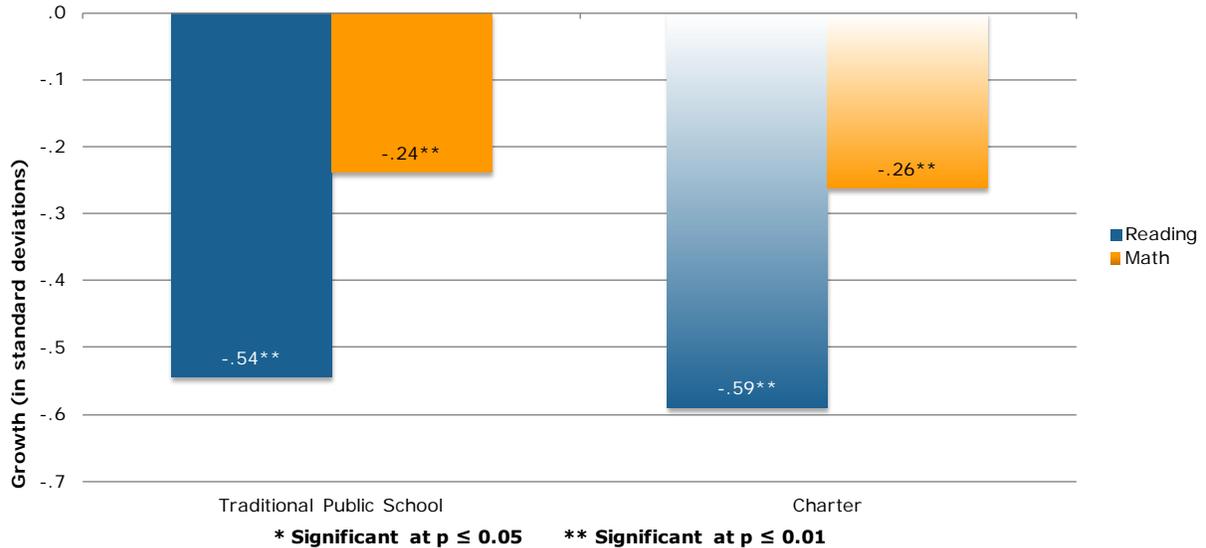
Figure 20: Impact with Special Education Students in Detroit



Special education students in Detroit charter schools progressed significantly less than their counterparts in Detroit TPS in both reading and math, though the degree of difference was small. When these differences were added to the general lower performance of the average SPED student, their growth was significantly weaker than that of the comparison group, TPS non-SPED students. These results are in line with findings at the state level.

Impact with English Language Learners The results for Detroit students who are English Language Learners are shown in Figure 21 below.

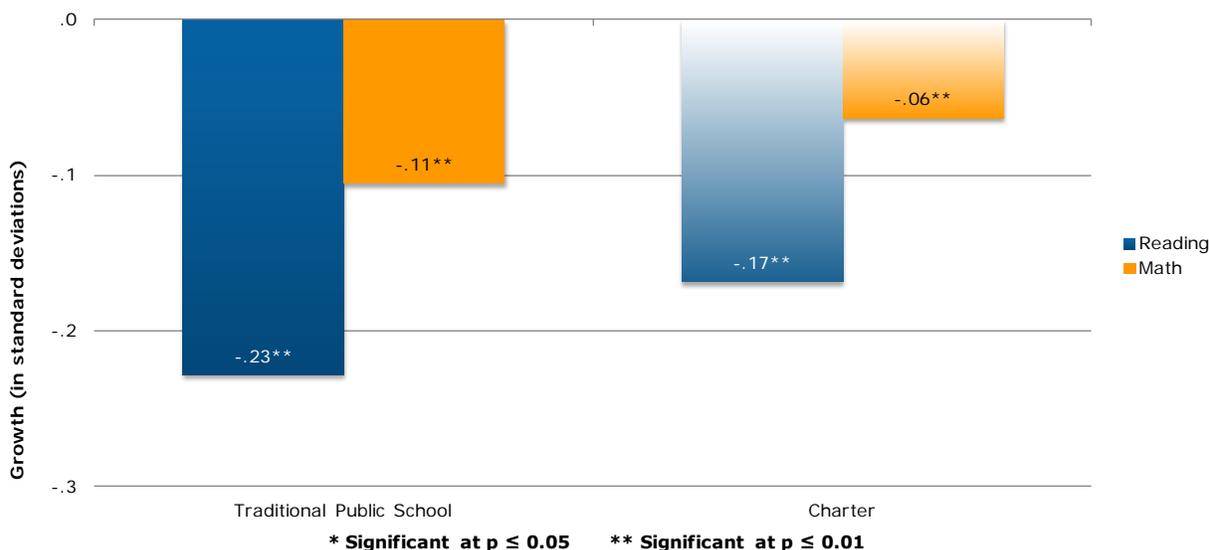
Figure 21: Impact with Detroit English Language Learners



Students who are English Language Learners in traditional public and charter schools in Detroit have significantly lower learning gains than the typical statewide TPS student who is a native or fluent English speaker. As is typical, the ELL students in Detroit display better results in math than for reading in both charter and TPS settings. Their academic progress in charter schools is slightly weaker than their peers in TPS for both subjects. The comparison is statistically significant.

Impact with Grade-Repeating Students As was found statewide, retained charter students in Detroit have the lowest match rate of any subgroup in our study, which suggests that Detroit charter schools are more likely to retain academically low-performing students than their feeder TPS. The results for Detroit students who are repeating a grade are shown in Figure 22 below.

Figure 22: Impact with Detroit Grade-Repeating Students



In both reading and math, retained students in Detroit charter schools have significantly better learning gains than their Detroit TPS counterparts. Nonetheless, retained students in both Detroit TPS and charter schools have overall lower reading and math gains compared to non-retained students statewide in traditional public schools, the baseline of comparison.

Comparative School-level Quality As with the statewide results, comparing charter school performance to the local traditional public school alternative in Detroit can be an informative measure of quality. Using the same criteria that were described in the section above on statewide comparative school-level quality, it was possible to include 97 Detroit charter schools in reading comparisons and 98 schools in math for this analysis. The results for these Detroit charter schools are shown in Table 7 below.

Table 7: Performance of Detroit Charter Schools Compared to Their Local Markets

Subject	Significantly Worse		Not Significant		Significantly Better	
	Number	Percent	Number	Percent	Number	Percent
Reading	1	1%	50	52%	46	47%
Math	7	7%	43	44%	48	49%

In reading, 47 percent of charter schools perform significantly better than their traditional public school market, which is more positive than the 35% for Michigan charter schools as a whole. In math, 47 percent of Detroit charter schools perform significantly better than their local peers, the same proportion as for the charters as a whole statewide. Both of these results are dramatically better than the 2009 national study's proportion of better-performing charters (17 percent).¹⁷ Slightly more than half of Detroit charter schools were not significantly different from their market.

By comparison to the state, 12% more of Detroit's schools are significantly better in reading than their local market (47% vs 35% of the state overall.) A similar proportion of schools are doing worse than their local market. In math, 7% more of Detroit's schools have higher growth than their local market (49% vs. 42%)

Synthesis and Conclusions

Based on the findings presented here, the typical student in Michigan charter schools gains more learning in a year than his TPS counterparts, amounting to about two months of additional gains in reading and math. These positive patterns are even more pronounced in Detroit, where historically student academic performance has been poor. These outcomes are consistent with the result that charter schools have significantly better results than TPS for minority students who are in poverty.

A substantial share of Michigan charter schools appear to outpace TPS in how well they support academic learning gains in their students in both reading and math. Thirty-five percent of Michigan charters outpace the learning impacts of TPS in

¹⁷ CREDO. *Multiple Choice: Charter School Performance in 16 States* (2009). <http://credo.stanford.edu>.



reading, and forty-nine percent do so in math. These findings are even more positive in Detroit, where the figures are forty-seven percent in reading and forty-two percent in math. Fourteen percent of Michigan charter schools have below-average growth and below-average achievement, and the same is true for twenty-five percent of the charter schools in math. Students in these schools will not only have inadequate progress in their overall achievement but will fall further and further behind their peers in the state over time.

The share of underperforming charter schools is offset, however, by the fact that the proportion of charter schools that are either already achieving at high levels or at positions to reach those levels. In both reading and math, a majority of charter schools have academic growth that is above the average for all public schools in Michigan. For reading, the proportion is 82 percent and for math it exceeds 72 percent. Should these trends continue, the share of schools which currently lag the state average for absolute achievement would be expected to decline. These absolute improvements are within sight in Michigan.

Table 8 presents a summary of the results.

: Summary of Statistically Significant Findings for Michigan Charter School Students Compared to the Average Learning Gains for VCR Students

	Reading	Math
Michigan Charter Students	Positive	Positive
Detroit Charter Students	Positive	Positive
Suburban Detroit Charter Students	Positive	Positive
Charters in 2007	Positive	Positive
Charters in 2008	Positive	Positive
Charters in 2009	Positive	Positive
Charters in 2010	Positive	Positive
Charters in 2011	Positive	Positive
Students attending schools affiliated with CMOs	Positive	Positive
Students attending schools not affiliated with CMOs	Positive	Positive
Urban Students	Positive	Positive
Suburban Students	Positive	Positive
Rural Students	Positive	Positive
Elementary Charter Schools	Positive	Positive
Middle Charter Schools	Positive	Positive
Multi-Level Charter Schools	Positive	Positive
First Year Enrolled in Charter School	Positive	Positive
Second Year Enrolled in Charter School	Positive	Positive
Third Year Enrolled in Charter School	Positive	Positive
Fourth or More Year Enrolled in Charter School	Positive	Positive
Black Charter School Students	Positive	Positive
Hispanic Charter School Students	Positive	Positive
Charter School Students in Poverty	Positive	Positive
Black Charter School Students in Poverty	Positive	Positive
Hispanic Charter School Students in Poverty	Positive	Positive
English Language Learner Charter School Students		Negative
Special Education Charter School Students	Negative	Negative
Retained Charter School Students	Positive	Positive

Appendices

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

Appendix Table 1: Number of Observations for All Results

Student Group	Matched Charter Students	
	Reading	Math
Michigan Charter Students	169,130	172,594
Students in Detroit	46,287	46,858
Students from Suburban Detroit	40,664	41,453
Students in Charters in 2007	30,575	31,302
Students in Charters in 2008	33,268	33,919
Students in Charters in 2009	34,671	35,280
Students in Charters in 2010	34,517	35,237
Students in Charters in 2011	36,099	36,856
Students in Urban Schools	91,158	92,905
Students in Suburban Schools	54,478	55,797
Students in Town Schools	3,908	4,012
Students in Rural Schools	19,586	19,880
Students in Elementary Schools	123,202	125,491
Students in Middle Schools	9,011	9,152
Students in High Schools	936	1,004
Students in Multi-level Schools	35,936	36,897
Students First Year Enrolled in Charter School	27,917	28,783
Students Second Year Enrolled in Charter School	11,877	12,161
Students Third Year Enrolled in Charter School	4,019	4,147
Students Fourth Year Enrolled in Charter School	1,204	1,220
Black Students	99,388	100,853
Hispanic Students	7,885	8,477
White Students	57,731	58,911
Students in Poverty	112,786	115,421
Black Students in Poverty	78,734	79,790
Hispanic Students in Poverty	6,879	7,393
Special Education Students	10,217	11,681
English Language Learners	5,328	5,777
Grade Repeating Students	1,525	1,951

Appendix Table 2: Number of Observations for All Results in Greater Detroit

Student Group	Matched Charter Students	
	Reading	Math
Detroit Charter Students	86,951	88,311
Detroit Black Students	72,227	72,910
Detroit Hispanic Students	3,493	3,664
Detroit White Students	10,347	10,752
Detroit Students in Poverty	68,685	69,768
Detroit Black Students in Poverty	56,968	57,473
Detroit Hispanic Students in Poverty	3,302	3,450
Detroit Special Education Students	5,453	5,992
Detroit English Language Learners	4,190	4,475
Detroit Grade Repeating Students	1,187	1,455

Appendix Table 3: Starting Deciles in Michigan

Student Group	Matched Charter Students	
	Reading	Math
Students in Decile 1	23,303	22,243
Students in Decile 2	24,688	31,922
Students in Decile 3	22,140	27,129
Students in Decile 4	18,621	21,112
Students in Decile 5	19,264	16,800
Students in Decile 6	14,183	15,932
Students in Decile 7	15,066	12,962
Students in Decile 8	14,114	10,004
Students in Decile 9	10,131	7,527
Students in Decile 10	7,620	6,963

Appendix 4: Demographic Composition of Charter Students in Greater Detroit

Student Group	All Charter Students Tested		Matched Charter Students	
	Number	Percent	Number	Percent
Detroit Charter Students	48,797		44,434	
% Matched	44,434	91%		
Black Students	38,913	80%	36,697	83%
Hispanic Students	2,517	5%	1,839	4%
White Students	6,372	13%	5,431	12%
Students in Poverty	38,236	78%	35,153	79%
Special Education Students	4,148	9%	3,185	7%
English Language Learners	3,032	6%	2,291	5%
Grade Repeating Students	1,806	4%	841	2%