

A STRAIGHTFORWARD COMPARISON OF CHARTER SCHOOLS AND REGULAR PUBLIC SCHOOLS IN THE UNITED STATES

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ABSTRACT

This study compares the reading and mathematics proficiency of charter school students to that of their fellow students in neighboring public schools. Unlike previous studies, which include only a tiny fraction (3 percent) of charter school students, this study covers 99 percent of such students. The charter schools are compared to the schools that their students would most likely otherwise attend: the nearest regular public school and the nearest regular public school with a similar racial composition. In most cases, the two comparison schools are one and the same. Compared to students in the nearest regular public school, charter students are 4 percent more likely to be proficient in reading and 2 percent more likely to be proficient in math, on their state's exams. Compared to students in the nearest regular public school with a similar racial composition, charter students are 5 percent more likely to be proficient in reading and 3 percent more likely to be proficient in math. In states where charter schools are well-established, charter school students' proficiency "advantage" tends to be greater.

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EXECUTIVE SUMMARY

This study compares the reading and mathematics proficiency of charter school students in the United States to that of their fellow students in neighboring public schools. Unlike previous studies, which include only a tiny fraction of charter school students, this study covers 99 percent of such students. Nearly all students can be included because charter schools are public entities and their students thus take state exams.

Because charter schools enroll only 1.5 percent of students, it is important include nearly all of them in a study. To see this, consider a recent American Federation of Teachers (AFT) study which attempted to draw conclusions about states' charter school policies based on a sample of 3 percent of students.¹ That sample represents about 4 fourth graders in Connecticut charter schools, 14 in District of Columbia charter schools, 32 in New York charter schools, and 38 in New Jersey charter schools. Even in the charter-friendly state of Arizona, the number is only 108. Charter schools in an entire state cannot be evaluated based on one or two classrooms of students. Meaningful comparisons require larger numbers of students.

Because previous studies have investigated data on fourth graders from the National Assessment of Educational Progress, this study also focuses on the proficiency of fourth graders. In states where fourth graders are not tested, fifth or third graders' proficiency is used instead. In all states, charter school and public school students are compared in the same grade, on the same test, with the same proficiency threshold, facing the same regulations on testing.

The charter schools are compared to the schools that their students would most likely otherwise attend: the nearest regular public school and the nearest regular public school with a similar racial composition. Most (92.4 percent) of the time, the two comparison schools are one and the same because the nearest regular public school has a similar racial composition. Of course, the charter schools and comparison schools generally share a neighborhood.

Compared to students in the nearest regular public school, charter students are 4 percent more likely to be proficient in reading and 2 percent more likely to be proficient in math, on their state's exams. Compared to students in the nearest regular public school with a similar racial composition, charter students are 5 percent more likely to be proficient in reading and 3 percent more likely to be proficient in math. As a rule, the charter schools' proficiency "advantage" is larger when the comparison school has a similar racial composition.

In states where charter schools are well-established, charter school students' advantage in proficiency tends to be greater. For instance, in Arizona, fourth grade charter students are about 7 percent more likely to be proficient in reading and math than students in the nearest regular public schools. In California, the corresponding proficiency advantages are about 8 percent in reading and 3 percent in math. In Colorado, the corresponding proficiency advantages are about 11 percent in reading and math. In the District of Columbia, where 11.3 percent of students are enrolled in charter schools (by far the highest percentage of any state), the charter school advantage is large. There, fourth grade charter students' advantage is 35 percent or more in both reading and math. Other states in which charter students have a statistically significant

advantage in at least one subject are Alaska, Florida, Georgia, Hawaii, Illinois, Louisiana, Massachusetts, New Jersey, Nevada, Oregon, Pennsylvania, and Wisconsin.

North Carolina is the only state in which charter students' proficiency is statistically significantly lower, by 4 percent, in both reading and math, compared to students in the nearest public school. In addition, Texas' charter students appear to be statistically significantly less proficient in math (not reading).

A number of states have charter school laws but have only a handful of charter school students. Students in these charter schools contribute to the overall U.S. comparison, but are too few in number to produce meaningful results at the level of the individual state. The following states have fewer than 200 fourth graders in charter schools: Arkansas, Connecticut, Indiana, Kansas, Mississippi, New Mexico, Nevada, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wyoming. In addition, some states with a fair number of charter students do not produce statistically significant findings.

It is important to distinguish between results that are not statistically meaningful and a finding of zero difference between charter schools and public schools. A poll that is 50-50 with a margin of error of 1 percent indicates a zero difference or a dead heat. A poll that is 55-45 with a margin of error of 25 percent does not indicate a zero difference; it is simply not statistically useful for evaluating which candidate will win. In many states, the charter school - public school comparison is parallel to the latter poll: it is not statistically meaningful. Usually a pollster can poll more people when the margin of error is too large, but this study already includes all available charter school students. Fundamentally, it is just too early to evaluate charter policy in some states.

This study is useful because it is comprehensive and compares charter schools to the schools their students would otherwise likely attend. It demonstrates that, although it is too early to draw sweeping conclusions, the initial indications are that the average student attending a charter school has higher achievement than he or she otherwise would. These initial indications should give policy makers the patience to wait for the results of studies that follow students who are randomly assigned to attend and not attend charter schools. Because many charter schools have more applicants than places, they routinely hold lotteries, which allow scientific, random assignment studies to be conducted. Multiple such studies are underway. An early example is Hoxby and Rockoff (2004), who find that a large system of Chicago charter schools raised math and reading scores by about 6 percentiles, among students who entered in grade 3 or below.² (Relatively few students enter after grade 3, so there are no statistically significant findings for them.)

I. WHY A NATIONAL COMPARISON OF CHARTER AND REGULAR PUBLIC SCHOOLS?

Charter schools are a form of school choice that a growing number of people find interesting. This is because charter schools may provide positive competition for regular public schools. They may also be innovators in school management, curriculum, and the use of technology. They may provide alternatives for children who would otherwise be confined to failing schools. An effective, safe alternative school may be especially important for families who are disadvantaged because they often lack the means to escape a failing school by moving to another area. Charter schools are public schools and thus accept all students equally. Also, charter schools participate in their states' accountability systems and obey many state and federal regulations. The essential difference between charter schools and regular public schools is that charter schools exist on a fee-per-student basis. If they can attract students, they can grow. However, if they fail to attract students, they will inevitably close. In short, charter schools combine elements of regular public schools and private schools and therefore interest people who want to see reform in American education but who worry about a laissez faire market for education.

Charter schools are a fledgling reform: they enroll only 1.5 percent of American students. Several states have no charter schools at all, and only 7 states and the District of Columbia have more than 2 percent of their students in charter schools. Thus, charter schools are an important part of federal and state efforts to improve schools mainly because they help policy makers envision the future, not because they already enroll many students. Not surprisingly, much of the public is unfamiliar with charter schools and wonders how students fare in them. This study attempts to fill that gap by providing a comprehensive look at charter schools in the United States. It examines the achievement of 99 percent of fourth graders who attend charter schools.³ Their performance is compared to that of students in the regular public school nearest them—that is, the school that the charter students would otherwise most likely have attended.

It should be said at the outset that this study is useful because it is comprehensive and timely. The comparison it makes is reasonable and helps policy makers answer the question, "What if charter schools did not exist?" However, the best and most scientific way to determine how charter schools affect students is a randomized study that follows students over multiple years. Because charter schools often have more applicants than spaces and are not allowed to

select their students, they hold random lotteries among applicants. Therefore, a researcher can compare students who randomly were assigned to enroll and not enroll in a charter school. A researcher can follow the charter school students and the randomly selected comparison group over several years of education, confident that both groups had families who were motivated to apply to charter schools. (Parents may be motivated to apply because they are ambitious for their children, but parents may also be motivated to apply because their children are already performing poorly in their regular school.) In addition, a researcher can often see how students were performing *before* they applied to charter schools. Using pre-application data, a researcher can verify that the lottery was random and show which types of students are attracted to charter schools.

Studies using the randomized method are currently underway. An early example is Hoxby and Rockoff (2004), who study a large system of Chicago charter schools and find that they raise achievement by about 6 percentiles among students who enroll in charter schools in grade three or earlier.⁴ (There are too few students who enroll in later grades to produce statistically significant results for them.)

The reason that randomized studies are so valuable is that they guarantee that a researcher is comparing apples to apples. A randomized study tells us what would have happened to students if they had not attended charter schools. This is the best answer to policy makers' "what if" question: what if charter schools did not exist and students attended whatever school they would have attended in their absence?

A poorly designed study of charter schools compares apples to oranges—that is, it compares charter schools to schools that the charter students were unlikely to attend in any case. Keep in mind that the typical American student does not attend a charter school. Affluent parents whose children are doing fine in suburban schools rarely send them to fledgling charter schools. Instead, charter schools disproportionately arise where families are relatively poor, likely to be racial minorities, likely to speak English as a second language, and likely to have a single parent. Policy makers' "what if" question cannot be answered by, say, comparing a charter school student who would otherwise have attended an inner-city public school to a student in an affluent, suburban school.

The American Federation of Teachers (AFT) has recently promoted statistics based on the comparison of fourth graders in charter schools to the typical fourth grader in regular public

schools. Much attention has been paid to this crude comparison, and many people have incorrectly interpreted it as sound evidence that charter schools reduce achievement. Little attention has been given to the fact that when the AFT compared black students to black students or Hispanic students to Hispanic students, the results did not confirm the crude comparison. In other words, even a mild attempt to compare apples to apples showed that the crude comparison was misleading. Moreover, the AFT study was based on a sample of only 3 percent of students. Because charter schools enroll only 1.5 percent of students in America, a 3 percent sample amounts to only 4 fourth graders in Connecticut charter schools, 14 in DC charter schools, 32 in New York charter schools, and 38 in New Jersey charter schools. Even in the charter-friendly state of Arizona, the number is only 108. A state's charter school policy cannot be evaluated using the equivalent of one or two classrooms of students. An analysis of charter schools that is statistically meaningful requires larger numbers of students.⁵

Fortunately, a comprehensive study is possible because charter school students take their states' exams, under the same regulations as apply to students in regular public schools. This study uses assessment data on 99 percent of fourth graders enrolled in charter schools, except that fifth or third graders are used in states that do not test fourth graders. It is important to understand that this is not a sample: it is all charter students for whom results are reported. (The missing 1 percent are in first year start-up schools or schools so small that scores are kept confidential to protect individual students). Moreover, the comprehensive data make it possible to compare charter schools to the schools that their students would otherwise most likely attend: the nearest regular public school and the nearest regular public school with a similar racial composition. The data make it possible to stay within the neighborhood—a charter school never ends up being compared to regular public schools that are in different states or face very different local circumstances.

This study is designed to be straightforward. The findings are based on computing the difference between each charter school and its comparison school and then averaging those differences. The averages shown are representative of charter students in the United States or charter students in a particular state. No complicated statistics are used. The only computation that requires statistical training is the calculation of standard errors, which help us distinguish between differences that are statistically significant and differences that are not meaningful.

II. WHAT THIS STUDY DOES

II.A. Comparisons of Proficiency

This study examines differences in achievement between charter school students and students in regular public schools. The students' performance on their state tests is examined.⁶ To facilitate comparison between this study and national data, this study focuses on fourth graders, a sample of whom were tested by the National Assessment of Educational Progress (NAEP) in 2002-03.⁷ The District of Columbia and all 36 of the states that had charter school students enrolled in the relevant grade in 2002-03 are included. Of these states, 25 tested fourth graders, 11 tested fifth graders, and one tested third graders. Fourth grade test results are used when they exist; otherwise, the fifth or third grade results are used. Keep in mind that students are always being compared to others in *the same grade*. A charter school and its neighboring public school administer the same exams, in the same grade.

This study focuses on reading achievement and mathematics achievement, which are tested by all states and NAEP.⁸ This study shows its findings in terms of proficiency levels, which all states and NAEP publish.⁹ Although states set proficiency levels somewhat differently, charter students are always compared to regular public school students who face the *same* proficiency standards. If a state has a high standard for proficiency, the percentage of students who reach it will typically be lower in *both* the charter school and in the nearest regular public school. In addition, this study shows findings for individual states whenever they are statistically meaningful.

Under the No Child Left Behind (NCLB) law, all schools are encouraged to have very high participation rates on their state's exam in order to make Adequate Yearly Progress. Also, NCLB mandates publication of disaggregated data whenever publication does not imperil the confidentiality of students' records. Therefore, by using the most recent year of performance data that is available, this study maximizes the coverage of charter school students and their public school peers.¹⁰ Keep in mind, however, that charter school students are always compared to regular public school students who face the *same* regulations on test participation and publication of test scores.

In short, the data are chosen to facilitate comparison with national data. Students are always compared to others who take the same test, follow the same regulations, participate in the same state assessment program, and face the same proficiency standards.

II.B. Matching Charter Schools to the Public School Nearest Them

Each school address in the United States is translated into a latitude and longitude.¹¹ The distance between each charter school and each regular public school is calculated and the nearest is picked.¹² The nearest schools form the first comparison group used in this study. Of course, they share the charter school's neighborhood and local circumstances to the maximum extent possible. Usually, they also have a racial composition that is similar to that of the charter school.¹³

Occasionally, there is a second public school near a charter school that is almost as close as the nearest public school but is more similar to the charter school on the basis of racial composition. When such a second public school exists nearby, it is likely that the charter school is drawing from it, not the very closest school. After all, a charter school cannot draw black students, say, from a regular public school that does not have them. Thus, this study defines a second comparison group for the charter schools: the regular public school with the racial composition most similar to that of the charter school, selected from the public schools that are no more than 5 percent or 0.5 miles (whichever is larger) further away than the nearest public school. The vast majority (92.4 percent) of the time, the school that is nearest is also the school with the most similar racial composition among nearby schools.

A benefit of focusing on fourth graders is that it is easier to predict the school they would attend if the charter school did not exist. This is because parents are wary of sending their younger students far away for primary school.

II.C. Computing the Differences in Proficiency

The procedure for computing the average difference in proficiency between charter school and regular public school students is as follows. Subtract the percentage of students who are proficient in the nearest regular public school from each charter school's percentage of students who are proficient. This is the individual charter school's difference. Average these individual differences over all charter schools in the United States, weighting each school's difference by its number of students. The averages thus produced are representative of charter school students in the United States.¹⁴ The same process is repeated for individual states.

Because many charter schools are small and the proficiency of a single cohort of fourth graders is an imperfect measure of true achievement, an individual charter school's difference is often a noisy indicator of its true advantage or disadvantage vis-a-vis its neighboring public

school. It is important not to overinterpret the individual charter schools' differences. Rather, the individual differences need to be averaged, as described, until the average includes a sufficient number of students to be statistically meaningful.

A standard error is computed for each average.¹⁵ The standard errors indicate how much confidence we have that an average difference is meaningfully different from random noise. It is conventional to report as statistically significant only findings about which we have at least 90 percent confidence. These are the findings I report.¹⁶

It will turn out that the average differences for the entire United States are statistically significant. Also, the average differences tend to be statistically significant for individual states in which charter schools are relatively prevalent. However, the average differences are not statistically significant in a number of states where charter school students are so few that one cannot distinguish the average from noise with any real confidence. For instance, all of the following states have fewer than 200 fourth graders in charter schools and do not produce statistically meaningful results: Arkansas, Connecticut, Indiana, Kansas, Mississippi, New Mexico, Nevada, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wyoming. In addition, some states with a fair number of charter students do not produce statistically significant results because the charter schools' individual differences vary a lot, indicating that there is "noise" produced by factors like a new and unfamiliar test, brand-new charter schools, or other social or economic circumstances that affect students indirectly.

Saying that a difference is statistically insignificant or meaningless is *not* evidence that there is zero difference in performance between charter schools and regular public schools. It is important to distinguish between results that are statistically insignificant and a finding of zero difference. An analogy may help. A poll that is 50-50 with a margin of error of 1 percent indicates a zero difference or a dead heat between political candidates. A poll that is 55-45 with a margin of error of 25 percent does *not* suggest that there is a dead heat, yet it is also not statistically meaningful evidence that one candidate will win. It is indistinguishable from noise. In many states, the charter school - public school comparison is parallel to the 55-45 poll with a 25 percent margin of error. When pollsters find that their margin of error is too large, they usually go out and poll additional people in the hope of reducing the error. Because this study already includes all available assessment data on charter school students, there is nothing to be done about an individual state that does not produce statistically meaningful results.

Fundamentally, the data are telling us that it is too early to evaluate charter policy there.

Keep in mind that all states' charter students are included in the overall United States average, so it is truly representative of the nation.

III. THE STUDY'S COVERAGE

Table 1 shows the states that had charter school students enrolled in the relevant grade (usually fourth) in 2002-03. Notice that most states had only a small fraction of their students attending charter schools. Even among states with charter school enrollment, most had fewer than 2 percent of their students in such schools. The exceptions are Arizona (6.1 percent), California (2.5 percent), Colorado (3.8 percent), Delaware (4.3 percent), the District of Columbia (11.3 percent), Florida (2 percent), Michigan (3.8 percent), and Wisconsin (2.2 percent).

Table 1 also shows the number of charter schools with at least 10 students in the relevant grade. (The 10 student cut-off is used because test results by grade are generally not reported for smaller groups of students.) The total number of students in the relevant grades who attended these schools was 50,479 in 2002-03, which is the most recent year for which federal enrollment data are available.¹⁷ The study covers approximately 99 percent of the relevant students.¹⁸ Overall, the study covers the vast majority of charter school students in the relevant grades and provides an accurate representation of them.

IV. PROFICIENCY DIFFERENCES BETWEEN CHARTER SCHOOL STUDENTS AND STUDENTS AT THE REGULAR PUBLIC SCHOOLS NEAREST THEM

Tables 2 and 3 present findings on the proficiency differences between charter school students and students at nearby regular public schools. In each table, the left-hand column shows the results of comparing the charter students to students at the nearest public school. This is the comparison that is easiest to describe. The right-hand column shows the results when the comparison group is students at the nearest public school with a similar racial composition. This is the comparison that is probably most useful for evaluating charter school policy because it does the best job of identifying the schools from which the charter students are drawn. The two sets of results are generally very similar, however. This is to be expected because the two

comparison schools are one and the same 92.4 percent of the time.

Findings that are statistically significant at the 90 percent level (one asterisk) or the 95 percent plus level (two asterisks) are shown. A state is shown in the tables if it has at least one result that is statistically significant. None of the states with fewer than 200 students in the relevant grade appear.

Table 2 shows that, for the United States as a whole, charter school students are 3.8 percent more likely to be proficient on their state's reading examination when compared to students in the nearest public school. They are 4.9 percent more likely to be proficient when compared to students in the nearest public school with a similar racial composition. These findings are an average over states where charter schools are prevalent and well-established and states that have only a handful of students in fledgling charter schools.

The states where charter schools are relatively prevalent tend to have results that are statistically significant at the state level.¹⁹ Let us focus on the results in the right-hand column because they are the most useful for policy analysis. Compared to students in the nearest regular public school with a similar racial composition, Alaska's charter students are about 20 percent more likely to be proficient in reading; Arizona's, California's, Massachusetts', and Pennsylvania's are about 8 percent more likely to be proficient; Colorado's, New Jersey's, and Nevada's are 10 to 11 percent more likely to be proficient; Florida's and Georgia's are 5 to 6 percent more likely to be proficient; Hawaii's, Illinois', and Oregon's are 14 to 16 percent more likely to be proficient; and Louisiana's and the District of Columbia's are more than 30 percent more likely to be proficient. North Carolina's charter students are about 4 percent less likely to be proficient in reading. Michigan presents a mixed picture. The results for the nearest public school suggest that charter students are about 4 percent less likely to be proficient in reading, but this result disappears when the comparison group is students in the nearest public school with a similar racial composition. The Michigan results are so sensitive to a small difference in how race is treated that they suggest that student achievement varies significantly by race in Michigan. In consequence, we need to be more careful, not less careful, about comparing charter schools to the schools their students would otherwise likely attend.

Now turn to Table 3, which show mathematics proficiency. It shows that, for the United States as a whole, charter school students are 1.6 percent more likely to be proficient on their state's math examination when compared to students in the nearest public school. They are 2.8

percent more likely to be proficient when compared to students in the nearest public school with a similar racial composition. It is not surprising that the differences are smaller in mathematics than in reading, simply because schools tend to emphasize the reading skills in the grades leading up to grade four. Thus, the earlier the grade, the more reading results are the precise indicator of school effectiveness. (This tendency reverses itself in secondary school grades, where math results are often more precise measures of achievement.)

Now examine some individual states with enough charter school students to produce statistically significant findings for math. Let us again look mainly at the results in the right-hand column because they are the most useful for policy analysis. Compared to students in the nearest regular public school with a similar racial composition, Alaska's charter students are about 17 percent more likely to be proficient in math; Arizona's, Massachusetts', and Wisconsin's are about 7 to 8 percent more likely to be proficient; California's are about 3 percent more likely to be proficient; Colorado's and Hawaii's are 12 to 13 percent more likely to be proficient; Illinois' are about 21 more likely to be proficient; Louisiana's are about 29 percent more likely to be proficient, and the District of Columbia's are about 41 percent more likely to be proficient.

North Carolina's charter students are about 4 percent less likely to be proficient in math. This makes it the only state with both reading and math results that suggest charter school students being at a disadvantage. Texas' charter schools are about 8 percent less likely to be proficient in math. New York and Ohio present mixed pictures because the results for the nearest public school suggest that charter students are about 9 to 10 percent less likely to be proficient in reading, but this result disappears when the comparison group is students in the nearest public school with a similar racial composition. The sensitivity of these results to small differences in how race is treated suggests that achievement varies substantially with race in these states. This should make us more careful about comparing charter schools from to the schools from which they actually draw.

On important lesson to take from Tables 2 and 3 is that, in many states, it is too early to do straightforward comparisons of charter schools and regular public schools. More will be learned when these states have more charter students and more and longer-established charter schools.

V. CONCLUSIONS

In this study, charter school students' achievement is compared in a straightforward way to the achievement of students in the nearby regular public schools that the charter students would likely otherwise attend. The results are comprehensive and representative for charter school students in the about the fourth grade. Over the United States as a whole, the charter school students are 4 to 5 percent more proficient in reading and 2 to 3 percent more proficient in math. States where charter schools are prevalent tend to have larger positive results, but there are exceptions such as North Carolina. Because there are a number of states with results that are not statistically meaningful or easily interpretable, it is evident that it is early days for evaluating charter schools. On the whole, the results suggest that the average charter school student in the United States benefits from having a charter school alternative. These results should presumably make us patient enough to wait for the results of multi-year studies based on random lotteries among charter school applicants. Such studies use the scientific method most likely to inform policy debates on charter schools.

TABLE 1
STATES' CHARTER SCHOOL ENROLLMENT AND THE STUDY'S COVERAGE

State	Charter Enrollment as a % of State's Total Enrollment	Charter Schools Operating in 2002- 03 with at least 10 Students in the Relevant Grade (usually 4th)	Relevant Enrollment in those Charter Schools	This Study Covers Approximately this % of Charter Students in the Relevant Grade
United States			50,479	99%
Alaska	1.9%	11	252	100%
Arizona	6.1%	113	3,380	89%
Arkansas	0.2%	1	36	100%
California	2.5%	199	11,231	100%
Colorado	3.8%	58	2,743	100%
Connecticut	0.4%	4	129	100%
Delaware	4.3%	8	522	100%
D.C.	11.3%	12	471	100%
Florida	2.0%	93	3,964	100%
Georgia	1.7%	28	2,575	97%
Hawaii	1.8%	7	233	100%
Idaho	1.2%	7	271	100%
Illinois	0.4%	9	366	100%
Indiana	0.1%	7	150	100%
Kansas	0.4%	5	107	60%
Louisiana	0.6%	8	330	88%
Massachusetts	1.6%	20	1,211	100%
Michigan	3.8%	135	6,729	99%
Minnesota	1.4%	30	792	100%
Mississippi	0.1%	1	42	100%
Missouri	1.1%	14	783	100%
Nevada	0.8%	6	199	92%
New Jersey	0.9%	34	1,270	94%
New Mexico	1.4%	5	197	80%
New York	0.4%	23	1,059	100%
North Carolina	1.5%	59	1,963	100%
Ohio	1.9%	68	2,811	100%
Oklahoma	0.4%	1	40	100%
Oregon	0.4%	7	125	100%
Pennsylvania	1.8%	47	2,552	100%
Rhode Island	0.4%	2	26	54%
South Carolina	0.2%	4	94	100%
Texas	1.3%	86	2,524	100%
Utah	0.3%	4	130	100%
Virginia	0.0%	1	13	100%
Wisconsin	2.2%	26	1,146	100%
Wyoming	0.1%	1	13	100%

Notes: Some percentages are less than 100 because states do not report performance of students in grades where few students have test results or where the school has started up only that year. Sources: National Center for Education Statistics, Common Core of Data; Author's Calculations Using States' Test Data

TABLE 2
DIFFERENCES IN READING PROFICIENCY BETWEEN CHARTER SCHOOLS
AND THE REGULAR PUBLIC SCHOOLS NEAREST THEM

State	Average Difference in the Percentage of Students who are Proficient in Reading	
	Comparing Charter Schools to the Nearest Regular Public School	Comparing Charter Schools to the Nearest Regular Public School with Similar Racial Composition
United States	3.8 **	4.9 **
Alaska	19.3 **	20.1 **
Arizona	7.0 **	7.6 **
California	7.4 **	8.2 **
Colorado	11.5 **	11.4 **
District of Columbia	35.3 **	36.6 **
Florida	4.4 **	4.6 **
Georgia	5.9 **	5.9 **
Hawaii	13.7 **	14.3 **
Illinois	14.9 **	16.2 **
Louisiana	32.9 **	32.9 **
Massachusetts	7.1 **	8.4 **
Michigan	-3.8 *	n/a
North Carolina	-4.2 **	-4.1 **
New Jersey	n/a	10.1 **
Nevada	10.3 **	10.3 **
New York	n/a	n/a
Ohio	n/a	n/a
Oregon	13.6 **	13.6 *
Pennsylvania	n/a	8.5 **
Texas	n/a	n/a
Wisconsin	n/a	n/a

Notes: Author's calculations based on states' proficiency data and computations described in text. The grade tested is generally the fourth grade, but fifth or third graders' results are used for states that do not test the fourth grade. See the Data Appendix for a full list. A single asterisk indicates that the difference is statistically significant with a confidence level of 90 percent. Double asterisks indicate that the difference is statistically significant with a confidence level of 95 percent. "n/a" indicates that there is no statistically significant finding to report (see text).

Table 3
DIFFERENCES IN MATH PROFICIENCY BETWEEN CHARTER SCHOOLS
AND THE REGULAR PUBLIC SCHOOLS NEAREST THEM

State	Average Difference in the Percentage of Students who are Proficient in Math	
	Comparing Charter Schools to the Nearest Regular Public School	Comparing Charter Schools to the Nearest Regular Public School with Similar Racial Composition
United States	1.6 **	2.8 **
Alaska	19.6 **	16.9 **
Arizona	6.1 **	7.4 **
California	3.0 *	3.3 **
Colorado	11.0 **	12.9 **
District of Columbia	40.0 **	41.5 **
Florida	n/a	n/a
Georgia	n/a	n/a
Hawaii	11.4 **	11.7 **
Illinois	n/a	21.0 **
Louisiana	29.1 **	29.1 **
Massachusetts	7.3 **	7.8 **
Michigan	n/a	n/a
North Carolina	-4.2 **	-4.1 **
New Jersey	n/a	7.0 *
Nevada	n/a	n/a
New York	-9.7 *	n/a
Ohio	-8.7 **	n/a
Oregon	n/a	n/a
Pennsylvania	n/a	n/a
Texas	-11.4 **	-8.3 **
Wisconsin	7.8 *	7.9 *

Notes: Author's calculations based on states' proficiency data and computations described in text. The grade tested is generally the fourth grade, but fifth or third graders' results are used for states that do not test the fourth grade. See the Data Appendix for a full list. A single asterisk indicates that the difference is statistically significant with a confidence level of 90 percent. Double asterisks indicate that the difference is statistically significant with a confidence level of 95 percent. "n/a" indicates that there is no statistically significant finding to report (see text).

DATA APPENDIX

The following list contains the sources of state assessment data and federal enrollment data. An additional source of geographical data is also listed. The most recent assessment data published by a state in mid August 2004 were used. States not shown had no charter school enrollment in the relevant grade in 2002-03.

State of Alaska, Department of Education and Early Development.
Terra Nova Cat/6, Reading and Mathematics exam, Grade 4 Results, 2002-03 school year.
Electronic data. <http://www.eed.state.ak.us/tls/assessment/results.html>.

State of Arizona, Department of Education, Accountability Division, Research and Evaluation Section.
Arizona's Instrument to Measure Standards (AIMS) test, Grade 5 results, 2003-04 school year.
Electronic data. <http://www.ade.state.az.us/profile/publicview/>

State of Arkansas, Department of Education.
Arkansas Benchmark Exam, Grade 4 Results, 2003-04 school year.
Electronic data. http://arkedu.state.ar.us/whats_new/BENCHMARK.htm

State of California, Department of Education.
California Standardized Testing and Reporting (STAR) program, Grade 4 Results, 2003-04 school year.
Electronic data. <http://star.cde.ca.gov/star2004/index.asp>

State of Colorado, Department of Education.
Colorado Student Assessment (CSAP), Grade 4 reading results, Grade 5 mathematics results, 2003-04 school year.
Electronic data. http://www.cde.state.co.us/index_assess.htm

State of Connecticut, Department of Education.
Connecticut Mastery Test (CMT), Grade 4 Results, 2002-03 school year.
Electronic data. <http://www.cmtreports.com>

State of Delaware, Department of Education.
Delaware Student Testing Program (DSTP), Grade 5 results, 2003-04 data school year.
Electronic data. <http://dstp.doe.state.de.us/DSTPMART/SummaryMenu.asp>

District of Columbia Public Schools. Stanford 9 test, Grade 4 results, 2003-04 school year.
Electronic data. <http://silicon.k12.dc.us/apds/APDSSummaryReports.asp>

District of Columbia Public Charter School Board. Stanford 9 test, Grade 4 results, 2003-04 school year.
Electronic data. <http://www.dcpubliccharter.com/>

State of Florida, Department of Education.

Florida Comprehensive Assessment Test (FCAT), Grade 4 results, 2003-04 school year.
Electronic data. <http://fcat.fldoe.org/>

State of Georgia, Department of Education.
Criterion Referenced Competency Test (CRCT), Grade 4 results, 2002-03 school year.
Electronic data. <http://reportcard.gaosa.org/>

State of Hawaii, Department of Education.
Hawaii State Assessment (HSA) test, Grade 5 results, 2002-03 school year.
Electronic data. <http://doe.k12.hi.us/>

State of Idaho, Board of Education.
Idaho Standards Achievement Test (ISAT), Grade 4 results, 2003-04 school year.
Electronic data. <http://www.idahoboardofed.org/saa/>

State of Illinois, Board of Education.
Illinois Standards Achievement Test (ISAT), Grade 5 results, 2002-03 school year.
Electronic data. <http://www.isbe.net/research/default.htm>

State of Indiana, Department of Education.
Indiana Statewide Testing for Educational Progress-Plus (ISTEP+), Grade 3 results, 2003-04 school year.
Electronic data. <http://www.doe.state.in.us/istep/welcome.html>

State of Kansas, Department of Education.
Kansas State Assessment, Grade 5 results, 2002-03 school year.
Electronic data. <http://www.ksde.org/assessment/>

State of Louisiana, Department of Education.
Louisiana Educational Assessment Program (LEAP), Grade 4 results, 2003-04 school year.
Electronic data. <http://www.doe.state.la.us/lde/accountability/home.html>

Commonwealth of Massachusetts, Department of Education.
Massachusetts Comprehensive Assessment System (MCAS), Grade 4 results, 2002-03 school year.
Electronic data. <http://www.doe.mass.edu/mcas/>

State of Michigan, Department of Education.
Michigan Education Assessment Program (MEAP), Grade 4 results, 2003-04 school year.
Electronic data. <http://www.michigan.gov/mde>

State of Minnesota, Department of Education.
Minnesota Comprehensive Assessment (MCA), Grade 5 results, 2003-04 school year.
Electronic data. <http://education.state.mn.us/ReportCard2004/>

State of Mississippi, Department of Education.

Mississippi Curriculum Test Data (MCT), Grade 4 results, 2003-04 school year.
Electronic data. <http://www.mde.k12.ms.us/ACAD/>

State of Missouri, Department of Elementary and Secondary Education.
Missouri Assessment Program (MAP), Grade 4 results (math), Grade 3 results (reading, known as Communication Arts), 2003-04 school year.
Electronic data. <http://www.dese.state.mo.us/commissioner/statereportcard/>

State of Nevada, Department of Education.
Nevada Criterion-Referenced Examination, Grade 5 results, 2003-04 school year.
Electronic data. <http://nevadareportcard.com/>

State of New Jersey, Department of Education.
Elementary School Proficiency Assessment (ESPA), Grade 4 results, 2002-03 school year.
Electronic data. <http://education.state.nj.us/rc/index.html>

State of New Mexico, Public Education Department.
New Mexico Standards-Based Assessment (NMSBA), Grade 4 results, 2003-04 school year.
Electronic data. <http://www.sde.state.nm.us>

State of New York, State Education Department (University of the State of New York).
New York State Testing Program, Grade 4 results, 2002-03 school year.
Electronic data. <http://www.emsc.nysed.gov/irts/>

State of North Carolina, State Board of Education, Department of Public Instruction.
ABCs of Public Education Tests, Grade 4 results, 2003-04 school year.
Electronic data. <http://abcs.ncpublicschools.org/abcs/>

State of Ohio, Department of Education.
Ohio Achievement Tests, Grade 4 results, 2003-04 school year.
Electronic data. <http://ilrc.ode.state.oh.us/>

State of Oklahoma, Department of Education.
Oklahoma Core Curriculum Test, Grade 5 results, 2002-03 school year.
Electronic data. <http://www.schoolreportcards.org/>

State of Oregon, Department of Education.
Oregon Statewide Assessment (OSA), Grade 5 results, 2003-04 school year.
Electronic data. www.ode.state.or.us/asmt/

Commonwealth of Pennsylvania, Department of Education.
Pennsylvania System of School Assessment (PSSA), Grade 5 results, 2003-04 school year.
Electronic data. http://www.pde.state.pa.us/a_and_t/

State of Rhode Island, Department of Elementary and Secondary Education.
New Standards Reference Exam, Grade 4 results, 2002-03 school year.

Electronic data. <http://www.ridoe.net/standards/stateassessment/>

State of South Carolina, Department of Education.

Palmetto State Achievement Tests (PACT), Grade 4 results, 2002-03 school year.

Electronic data. <http://www.myschools.com/reportcard/2003/>

State of Texas, Department of Education.

Texas Assessment of Knowledge and Skills (TAKS), Grade 4 results, 2002-03 school year.

Electronic data. <http://www.tea.state.tx.us/perfreport/>

State of Utah, Office of Education.

Core CRT test, Grade 4 results, 2003-04 school year.

Electronic data. <http://www.usoe.k12.ut.us/eval/evaluation/>

State of Virginia, Department of Education.

Standards of Learning (SOL), Grade 5 results, 2002-03 school year.

Electronic data. <http://www.pen.k12.va.us/VDOE/Assessment/home.shtml>

State of Wisconsin, Department of Public Instruction.

Wisconsin Knowledge and Concepts Examination (WKCE), Grade 4 results, 2003-04 school year.

Electronic data. <http://data.dpi.state.wi.us/data/performance.asp>

State of Wyoming, Department of Education.

Wyoming Comprehensive Assessment System (WyCAS), Grade 4 results, 2003-04 school year.

Electronic data. <http://www.k12.wy.us/aa.asp>

Location, Enrollment, and School Classification Information:

United States Department of Education, National Center for Education Statistics.

Common Core of Data, 2002-03 school year.

Electronic data. <http://nces.ed.gov/ccd/ccddata.asp>

supplemented with data from www.geocode.com when necessary.

Endnotes

1. The study is posted on www.aft.org.
2. See Caroline M. Hoxby and Jonah Rockoff, “The Impact of Charter Schools on Student Achievement: A Study of Students Who Attend Schools Chartered by the Chicago Charter School Foundation.” It and an executive summary are posted online at www.economics.harvard.edu/~choxby/papers.
3. In states where fourth graders are not tested, fifth or third graders’ achievement is examined. See below for details.
4. See endnote 2.
5. The National Assessment of Educational Progress (NAEP) is a reliable test that has proven extraordinarily useful for tracking American achievement over time. Its sampling scheme is carefully designed to this end. However, NAEP was not designed for comparisons between regular public schools and a phenomena as scarce and as idiosyncratically distributed as charter schools. Essentially, the problem is the following. NAEP is designed to be representative of American schools in general. NAEP picks up charter schools but only where they really are and in proportion to their share in the population (1.5 percent of students). Because charter schools are highly unusual and idiosyncratically distributed, the NAEP sample of charter school students is unusual and idiosyncratically distributed. The NAEP sample of regular public school students is, in contrast, usual. It thus includes many students who have no comparable peer in the charter school sample. Crude comparisons using NAEP data inevitably include inappropriate public school students in the control group.
6. The list of tests and data sources is in the Data Appendix.
7. In addition, it is wise to focus on elementary schools because charter schools are disproportionately elementary schools. For instance, fourth graders make up more than 11.3 percent of charter school students, even though they would make up only 7.6 percent if charter schools were equally distributed over all grades between kindergarten and twelfth.
8. Some states have an English language arts exam or exams. In all cases, the exam or part of the exam closest to reading is used.
9. The No Child Left Behind (NCLB) law has caused all states to be explicit about their proficiency standards. The states’ proficiency levels were used. The vast majority of the time, these are also the levels used for Adequate Yearly Progress calculations under NCLB. This study presents results based on proficiency levels because they are available for all states and are measured in the same units (the percentage who are proficient). Many states publish scale scores also. When standardized, the scale scores produce findings that confirm those based on the proficiency levels.
10. At the time this study was conducted, the District of Columbia and 14 states had published their data for the 2003-04 school year. 2002-03 data are used for the remaining 22 states. It is advantageous to use the 2003-04 data whenever available because participation rates rose in

nearly all states between the two year, owing to the implementation of NCLB.

11. In most cases, the *Common Core of Data 2002-03* provides the latitude and longitude of schools. The remaining school addresses were translated into latitude and longitude by geocode.com. See Data Appendix for citations.

12. The geocoding of address data has a small margin of error because addresses are mapped to discrete, not continuous, points of latitude and longitude in the United States. For instance, most addresses are mapped to a Census block. Then, the latitude and longitude at the center of that block are used. (The block is the smallest summary area used by the United States Census of Population). Some addresses are mapped by broader area—at worst, to a zipcode area.

The result of mapping addresses to discrete points of latitude and longitude is that schools with distances within 3 percent of one another are ties for the nearest public school. In dense urban areas, 0.3 miles rather than 3 percent defines a tie. When a tie occurs (usually, there is none), it is broken by using the school with the racial composition most similar to that of the charter school. The pool of potential comparison schools does not include non-regular public schools, such as alternative schools, schools for the disabled, schools that admit students based on examinations, and magnet schools to which a student must apply.

13. Compared to students in the nearest regular public school, charter schools' fourth graders are 2.4 percent more likely to be black, 1 percent less likely to be Asian, and 8 percent less likely to be Hispanic. If the free and reduced-price lunch programs generated pure measures of poverty, it would also be useful to match charter schools on the basis of these programs. However, the lunch program measures participation, not the eligibility of students, which is based purely on their family income. Charter schools that are small or recent start ups tend not to participate in the lunch programs even if some of their students are eligible. For a small school, the costs of running a formal program may exceed the benefits, and the school can always run an informal meals program

14. Strictly speaking, they are representative of the 99 percent of charter school students who are covered by this study.

15. The computation of standard errors that are robust to heteroskedasticity does not affect which are reported.

16. In the tables, asterisks are used to indicate whether the confidence level is 90 percent or 95 percent.

17. The federal enrollment data are from the United States Department of Education, *Common Core of Data, 2002-03*. It is useful for computing comparable enrollment statistics across states, for computing the racial composition of schools, and for identifying the location of schools. See the Data Appendix for the full citation.

18. The coverage ratio is approximate, not exact, because some students who are enrolled in the fall are no longer enrolled in the same school when state tests are administered. In addition, federal enrollment data are not yet available for 2003-04.

19. Whether a state has results that are statistically significant depends not only on its number of charter school students but also on the variation in the difference between charter students' achievement and the achievement of students in the comparison schools. The greater is this variation, the greater the noise, and the less likely are the results to be statistically significant.