

## WWC Review of the Report “National Charter School Study: 2013”<sup>1</sup>

The findings from this review do not reflect the full body of research evidence on charter schools.

### What is this study about?

The study examined the effect of charter schools on annual student achievement growth in reading and math in 25 states, the District of Columbia, and New York City. The study primarily used data on students in grades 3–8, but additional elementary and high school grades were included for several states.

Researchers analyzed data from state-level standardized reading and math tests administered during the 2008–09 through 2010–11 school years. The study authors also updated a previous analysis that had been conducted on a subset of 16 states with additional years of data.

More than 1.5 million charter school students were matched to students attending traditional public schools based on test scores and demographic characteristics. Eighty-five percent of charter school students were successfully matched.

To measure the impact of charter schools on annual achievement growth, study authors compared the year-to-year test score changes of charter school students with those of matched students attending traditional public schools.

### Features of Charter Schools

Charter schools are public schools that are established on the basis of a contract, or charter, that a private board holds. They are exempt from many state and district regulations that govern traditional public schools, including those involving staffing, curriculum, and budget decisions.

### WWC Rating

#### *The research described in this report meets WWC evidence standards with reservations*

This study was a large, multi-year analysis in which the authors matched students using demographic and academic characteristics.

Although the study matched charter school students with traditional public school students based on observed demographic characteristics and test scores, unobserved differences between the two groups may have existed. For example, charter school students may have been more motivated to do well in school or may have had other unobserved characteristics that influenced student achievement.

In addition, the primary study results described in this report (and summarized in Appendix C) do not have a straightforward interpretation because they blend the 1-year gains students experienced during their first year of charter school attendance and 1-year gains during subsequent years.<sup>2</sup>

Finally, the effect sizes reported in this study (which are based on an analysis of achievement gains) are not directly comparable to effect sizes reported by other studies that analyzed achievement levels.

### What did the study find?

The authors reported that charter school students in the sample (25 states, the District of Columbia, and New York City) had annual reading score growth that was 0.01 standard deviations higher than that of students in traditional public schools. This difference was statistically significant. There was no statistically significant difference between charter school students and traditional public school students in their year-to-year gains in math.

### Appendix A: Study details

Center for Research on Education Outcomes (CREDO). (2013). *National Charter School Study: 2013*. Stanford, CA: Author.

#### *Additional source:*

Center for Research on Education Outcomes (CREDO). (2013). *National Charter School Study Technical Appendix: 2013*. Stanford, CA: Author.

**Setting** The study analyzed data gathered from students who attended charter schools and traditional public schools in 25 states, the District of Columbia, and New York City. The 25 states were: Arizona, Arkansas, California, Colorado, Florida, Georgia, Illinois, Indiana, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, and Utah. The authors refer to this as a “27-state” sample because they estimated impacts separately for New York City and for the state of New York excluding New York City, and they counted the District of Columbia as a state. In addition to impacts estimated for the 27-state sample, the authors estimated impacts for a subset of 16 states that were included in an earlier study (CREDO, 2009. *Multiple choice: Charter school performance in 16 states*. Stanford University, CA).<sup>3</sup> The 16 states in the earlier study were: Arizona, Arkansas, California, Colorado (Denver only), the District of Columbia, Florida, Georgia, Illinois (Chicago only), Louisiana, Massachusetts, Minnesota, Missouri, New Mexico, North Carolina, Ohio, and Texas.

**Study sample** For each state, the study used data for students in grades 1–11 who attended charter schools and traditional public schools during 5 school years (from 2006–07 to 2010–11), as available. The specific grades and school years available for each state differed, but all states had data for grades 3–8, and all states except New Jersey had data from the 2008–09 through 2010–11 school years. The study emphasized analyses based on data from the 2008–09 through 2010–11 school years, so this review focuses on the corresponding findings.

For each year of the study, the authors identified feeder schools—defined as traditional public schools that students in charter schools would have attended had the charter schools not existed. Each student in a given charter school was matched to one or more students from the relevant feeder school on race/ethnicity, gender, English proficiency, subsidized lunch status, special education status, and grade level. Exact matches were required on each of these variables, and students in traditional public schools who attended a charter school in later years were excluded from being matched to a charter school student. Additional matching was done using the reading or math test score from the prior school year. The matching was conducted separately for reading and math test scores. To be considered a valid match, the prior year test scores of intervention and comparison students were required to differ by no more than 0.10 standard deviations. Using this process, it was possible for a charter school student to be matched to more than one traditional public school student. A “virtual twin” record was created for each charter school student by averaging the outcomes of up to seven traditional public school students with whom the charter school student was matched.

For the 27-state sample, valid matches were created for 86% of the tested charter school students in reading and 84% of the tested charter school students in math. The match percentages by state and subject range from a low of 73% in New Jersey for math to a high of 96% for Tennessee in reading. After conducting matches, the 27-state sample included more than 1.5 million charter school students from more than 4,500 charter schools. The 16-state sample included nearly 2,500 charter schools whose students had been included in the earlier CREDO study.

### **Intervention group**

The intervention group included students who were enrolled in a charter school in a study state during the 2008–09 through 2010–11 school years. Charter schools are public schools that are established on the basis of a contract, or charter, that a private board holds. Charter schools are typically intended to improve student learning and achievement by encouraging the use of different and innovative learning methods and establishing a new system of accountability for schools. Charter schools are exempt from many state and district regulations that govern traditional public schools, including those involving staffing, curriculum, and budget decisions.

### **Comparison group**

The comparison group included students from traditional public schools that were feeder schools to the charter schools included in the study. Students from traditional public schools who subsequently attended a charter school were excluded from the comparison group.

### **Outcomes and measurement**

The analyses that are the focus of this review examined year-to-year gains in standardized reading and math test scores from state-level assessments that were administered to students in the spring of each school year from 2008–09 through 2010–11. For a more detailed description of these outcome measures, see Appendix B.

### **Support for implementation**

Not applicable.

### **Reason for review**

This study was identified for review by the WWC by receiving significant media attention.

### Appendix B: Outcome measures for each domain

#### General reading achievement

##### *Gain in standardized reading scores*

Reading assessment scores were obtained from state-administered assessments given to students in specific grades. These scores were transformed into standardized reading scores by the study authors so that the standardized scores had a mean of 0 and a standard deviation of 1 within a state, grade, and year. The gain in standardized reading scores for a student was calculated as the difference between the student's standardized reading score in the current year and the standardized reading score in the previous year.

#### General math achievement

##### *Gain in standardized math scores*

Math assessment scores were obtained from state-administered assessments given to students in specific grades. These scores were transformed into standardized math scores by the study authors so that the standardized scores had a mean of 0 and a standard deviation of 1 within a state, grade, and year. The gain in standardized math scores for a student was calculated as the difference between the student's standardized math score in the current year and the standardized math score in the previous year.

Appendix C: Study findings for each domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
<b>General reading achievement</b>								
<i>Gain in standardized reading scores</i>	27 states	4,549 charter schools/ 1,734,232 charter school students	nr	nr	0.01	0.01	0	< 0.01
<b>Domain average for general reading achievement</b>						<b>0.01</b>	<b>0</b>	<b>Statistically significant</b>
<b>General math achievement</b>								
<i>Gain in standardized math scores</i>	27 states	4,547 charter schools/ 1,672,167 charter school students	nr	nr	-0.01	-0.01	0	> 0.05
<b>Domain average for general math achievement</b>						<b>-0.01</b>	<b>0</b>	<b>Not statistically significant</b>

**Table Notes:** Positive results for mean difference, effect size, and improvement index favor the intervention group; negative results favor the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the change (measured in standard deviations) in an average student’s outcome that can be expected if the student is given the intervention. The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. Because this study examined year-to-year *gains* in achievement, the effect sizes and improvement indices presented are not directly comparable to effect sizes that would be estimated in an analysis of achievement *levels*. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study’s domain average was determined by the WWC. nr = not reported.

**Study Notes:** No corrections for clustering or multiple comparisons and no difference-in-differences adjustment were needed. The p-values presented here were reported in the original study. The means and standard deviations for the 16-state sample were provided to the WWC by the authors. Means and standard deviations for the 27-state sample that is the focus of the study and this single study review were not included in the report, nor were they available from the authors because of data restrictions; the authors did, however, provide the number of charter students and schools for each analysis.

This study is characterized as having a statistically significant positive effect on general reading achievement because the effect for at least one measure within the domain is positive and statistically significant, and no effects are negative and statistically significant. This study is characterized as having indeterminate effects on general math achievement because no estimated effects within the domain were statistically significant. For more information, please refer to the WWC Standards and Procedures Handbook, version 2.1, page 96.

Appendix D: Supplemental findings by domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
<b>General reading achievement</b>								
<i>Gain in standardized reading scores</i>	27 states, Black students	4,549 charter schools/ 464,314 charter school students	nr	nr	0.02	0.02	+1	< 0.01
<i>Gain in standardized reading scores</i>	27 states, Hispanic students	4,549 charter schools/ 561,155 charter school students	nr	nr	0.00	0.00	0	> 0.05
<i>Gain in standardized reading scores</i>	27 states, White students	4,549 charter schools/ 624,914 charter school students	nr	nr	-0.02	-0.02	-1	< 0.01
<i>Gain in standardized reading scores</i>	27 states, Asian students	4,549 charter schools/ 60,783 charter school students	nr	nr	-0.01	-0.01	0	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students receiving free/reduced-price lunch	4,549 charter schools/ 974,981 charter school students	nr	nr	0.02	0.02	+1	< 0.01
<i>Gain in standardized reading scores</i>	27 states, English language learners	4,549 charter schools/ 112,007 charter school students	nr	nr	0.05	0.05	+2	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students receiving special education services	4,549 charter schools/ 60,783 charter school students	nr	nr	0.01	0.01	0	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students in charter school for 1 year	nr	nr	nr	-0.06	-0.06	-2	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students in charter school for 2 years	nr	nr	nr	0.03	0.03	+1	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students in charter school for 3 years	nr	nr	nr	0.06	0.06	+2	< 0.01
<i>Gain in standardized reading scores</i>	27 states, students in charter school for 4 or more years	nr	nr	nr	0.07	0.07	+3	< 0.01

(continued)

<i>Gain in standardized reading scores</i>	16 states, all charter schools	3,619 charter schools/ 1,425,630 charter school students	-0.02 (0.71)	-0.02 (0.48)	0.01	0.01	+1	< 0.01
<i>Gain in standardized reading scores</i>	16 states, charter schools in the 2009 study	2,459 charter schools/ 1,198,974 charter school students	-0.02 (0.70)	-0.02 (0.48)	0.01	0.01	+1	< 0.01
<i>Gain in standardized reading scores</i>	16 states, new charter schools since the 2009 study	1,160 charter schools/226,656 charter school students	-0.03 (0.71)	-0.02 (0.48)	-0.01	-0.01	-1	< 0.01
<b>General math achievement</b>								
<i>Gain in standardized math scores</i>	27 states, Black students	4,547 charter schools/ 456,470 charter school students	nr	nr	0.02	0.02	+1	> 0.05
<i>Gain in standardized math scores</i>	27 states, Hispanic students	4,547 charter schools/ 531,183 charter school students	nr	nr	-0.01	-0.01	0	> 0.05
<i>Gain in standardized math scores</i>	27 states, White students	4,547 charter schools/ 605,728 charter school students	nr	nr	-0.07	-0.07	-3	< 0.01
<i>Gain in standardized math scores</i>	27 states, Asian students	4,547 charter schools/ 53,488 charter school students	nr	nr	-0.04	-0.04	-2	< 0.05
<i>Gain in standardized math scores</i>	27 states, students receiving free/reduced-price lunch	4,547 charter schools/ 937,554 charter school students	nr	nr	0.03	0.03	+2	< 0.01
<i>Gain in standardized math scores</i>	27 states, English language learners	4,547 charter schools/ 102,095 charter school students	nr	nr	0.05	0.05	+2	< 0.01
<i>Gain in standardized math scores</i>	27 states, students receiving special education services	4,547 charter schools/ 102,291 charter school students	nr	nr	0.02	0.02	+1	< 0.01
<i>Gain in standardized math scores</i>	27 states, students in charter school for 1 year	nr	nr	nr	-0.08	-0.08	-3	< 0.01
<i>Gain in standardized math scores</i>	27 states, students in charter school for 2 years	nr	nr	nr	0.02	0.02	+1	< 0.01

(continued)

<i>Gain in standardized math scores</i>	27 states, students in charter school for 3 years	nr	nr	nr	0.03	0.03	+1	< 0.01
<i>Gain in standardized math scores</i>	27 states, students in charter school for 4 or more years	nr	nr	nr	0.06	0.06	+2	< 0.01
<i>Gain in standardized math scores</i>	16 states, all charter schools	3,582 charter schools/ 1,348,562 charter school students	-0.04 (0.68)	-0.03 (0.46)	-0.01	-0.01	-1	< 0.01
<i>Gain in standardized math scores</i>	16 states, charter schools in the 2009 study	2,425 charter schools/ 1,129,199 charter school students	-0.03 (0.68)	-0.03 (0.46)	-0.01	-0.01	-1	< 0.01
<i>Gain in standardized math scores</i>	16 states, new charter schools since the 2009 study	1,157 charter schools/ 219,363 charter school students	-0.05 (0.69)	-0.02 (0.46)	-0.03	-0.03	-2	< 0.01

**Table Notes:** The supplemental findings presented in this table are additional findings that do not factor into the determination of the evidence rating. Positive results for mean difference, effect size, and improvement index favor the intervention group; negative results favor the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the change (measured in standard deviations) in an average student's outcome that can be expected if the student is given the intervention. The improvement index is an alternate presentation of the effect size, reflecting the change in an average student's percentile rank that can be expected if the student is given the intervention. Because this study examined year-to-year *gains* in achievement, the effect sizes and improvement indices presented are not directly comparable to effect sizes that would be estimated in an analysis of achievement *levels*. nr = not reported.

**Study Notes:** No corrections for clustering or multiple comparisons and no difference-in-differences adjustment were needed. The *p*-values presented here were reported in the original study. The means and standard deviations for the 16-state sample were provided to the WWC by the authors. Means and standard deviations for the 27-state sample that is the focus of the study and this single study review were not included in the report, nor were they available from the authors because of data restrictions; the authors did, however, provide the number of charter students and schools for each analysis.



### Endnotes

\* On March 20, 2014, the WWC modified this report in response to an independent review by a quality review team. Based on the review, the WWC clarified the second caution described in the WWC Rating box on p. 1 and added endnote 2. In addition, Appendix D was revised to include results from the study for separate subgroups of students who have attended charter schools for 1, 2, 3, and 4 or more consecutive years.

<sup>1</sup> Single study reviews examine evidence published in a study (supplemented, if necessary, by information obtained directly from the author[s]) to assess whether the study design meets WWC evidence standards. The review reports the WWC's assessment of whether the study meets WWC evidence standards and summarizes the study findings following WWC conventions for reporting evidence on effectiveness. This study was reviewed using the single study review protocol, version 2.0. A quick review of this study was released on July 30, 2013, and this report is the follow-up review that replaces that initial assessment. The WWC rating applies only to the results that were eligible under this topic area and met WWC standards without reservations or met WWC standards with reservations, and not necessarily to all results presented in the study. The review focused on analyses that were emphasized in the study and analyses that examined key student subgroups. The study presented results from analyses including those based on different numbers of school years in the data, by state, by school grade span (elementary, middle, high), and by attendance in a charter school operated by a charter management organization.

<sup>2</sup> The authors also presented a model that differentiated the impact of gains by students who were in a charter school for exactly 1 year during the study period from students who were in a charter school for exactly 2, 3, or 4 or more consecutive years in the study period. These estimates use a limited sample relative to the base model presented in Appendix C. These findings are presented in Appendix D.

<sup>3</sup> The WWC also reviewed the evidence from the earlier study that focused on a subset of 16 states:  
[http://ies.ed.gov/ncee/WWC/pdf/quick\\_reviews/charterschools\\_021710.pdf](http://ies.ed.gov/ncee/WWC/pdf/quick_reviews/charterschools_021710.pdf)

### Recommended Citation

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### Glossary of Terms

<b>Attrition</b>	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
<b>Clustering adjustment</b>	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
<b>Confounding factor</b>	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
<b>Design</b>	The design of a study is the method by which intervention and comparison groups were assigned.
<b>Domain</b>	A domain is a group of closely related outcomes.
<b>Effect size</b>	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
<b>Eligibility</b>	A study is eligible for review if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
<b>Equivalence</b>	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
<b>Improvement index</b>	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
<b>Multiple comparison adjustment</b>	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
<b>Quasi-experimental design (QED)</b>	A quasi-experimental design (QED) is a research design in which subjects are assigned to intervention and comparison groups through a process that is not random.
<b>Randomized controlled trial (RCT)</b>	A randomized controlled trial (RCT) is an experiment in which investigators randomly assign eligible participants into intervention and comparison groups.
<b>Single-case design (SCD)</b>	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.
<b>Standard deviation</b>	The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample are spread out over a large range of values.
<b>Statistical significance</b>	Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ( $p < 0.05$ ).
<b>Substantively important</b>	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the [WWC Procedures and Standards Handbook \(version 2.1\)](#) for additional details.