Measuring the Impact of Charter Schools: Student Outcomes in 2023–24

Ian Mikkelsen

October 2025

WASHINGTON STUDENT ACHIEVEMENT COUNCIL
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Acknowledgements

We appreciate our partners at the State Board of Education (SBE) and the Office of Superintendent of Public Instruction (OSPI) whose data formed a critical foundation for the analysis. In particular, our thanks to Randy Spaulding and Gail Wootan of SBE, for their feedback and insight into charter schools in Washington as we wrote this report, and to Amy Rosenberg for her editing and advice on its development.

Preface

Washington law (RCW 28A.710.250) requires a report on the performance of the state's charter schools each year, comparing the performance of charter students against the performance of "academically, ethnically, and economically comparable groups of students in other public schools." This report compares performance between charter students and other public school (OPS) students on two key measures: scale score of performance across Math, ELA, and Science tests and the rate at which students meet state standards on these tests.

See the full RCW 28A.710.250 request:
https://app.leg.wa.gov/rcw/default.aspx?cite=28A.710.250

See previous reports: https://sbe.wa.gov/resources-reports

Disclaimer The research presented here uses confidential data from the Comprehensive Education Data and Research System (CEDARS), provided by the Office of Superintendent of Public Instruction (OSPI). CEDARS is a statewide longitudinal data system that includes de-identified data about students' school performance and individual characteristics. The views expressed here are those of the author and do not necessarily represent those of data contributors. Any errors are attributable to the author.

Executive Summary

Groups Compared

Charter students were matched with similar students in other public schools based on grade, race, income (FRPL eligibility), disability status, language, and, where available, prior test scores. This means the two groups were observably similar before outcomes were measured.

This report provides an evaluation of charter school effectiveness using student-level data from the 2023–2024 school year. This includes test scores, individual characteristics, grade level, and other characteristics. Our analysis covers 14 of the 18 charter schools in Washington, as the remaining 4 were either newly opened in 2023–2024 or do not have the necessary data to be included in our work.

Because random assignment to charter schools is not feasible, we used a matching method to compare charter students to other public school (OPS) peers with similar characteristics. This allows us to estimate the effect of charter school attendance while controlling for observable differences such as race, gender, language, income, disability status, and, where available, prior test scores. To evaluate performance, we compare the change in student test performance and likelihood of meeting state standards on their math and English Language Arts (ELA) state tests. This is done in aggregate by individual grade and by key demographic subgroups.

Key Findings

- **Overall performance**: Students attending charter schools scored higher than their OPS counterparts on statewide math and ELA assessments (see Figure ES 1).
    - On average, charter students scored **0.115 standard deviations higher in math** and **0.081 standard deviations higher in ELA**—roughly equivalent to an 8- to 12-point increase on the state's scale score.
    - Charter students also had a **6.1 percentage point increase in meeting math standards** and a **5.2 percentage point increase in meeting ELA standards**.

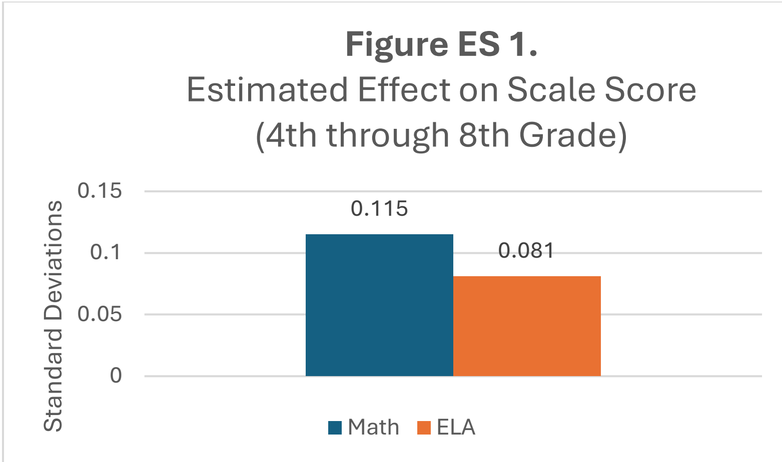

Figure ES 1: Charter students outperformed their OPS peers in both math and ELA on average.

- **Effects by Grade-Level (See Figure ES 2)**:
    - The strongest results appear in Grade 5, where students demonstrated large improvements in both math and ELA.
    - Positive and statistically significant gains were also observed in Grades 4, 7, and 8 (math) and in Grade 8 (ELA).
    - Results for 3rd and 10th grade in math and ELA, as well as 5th and 8th for science, should be viewed as exploratory, as prior test scores were unavailable for matching.

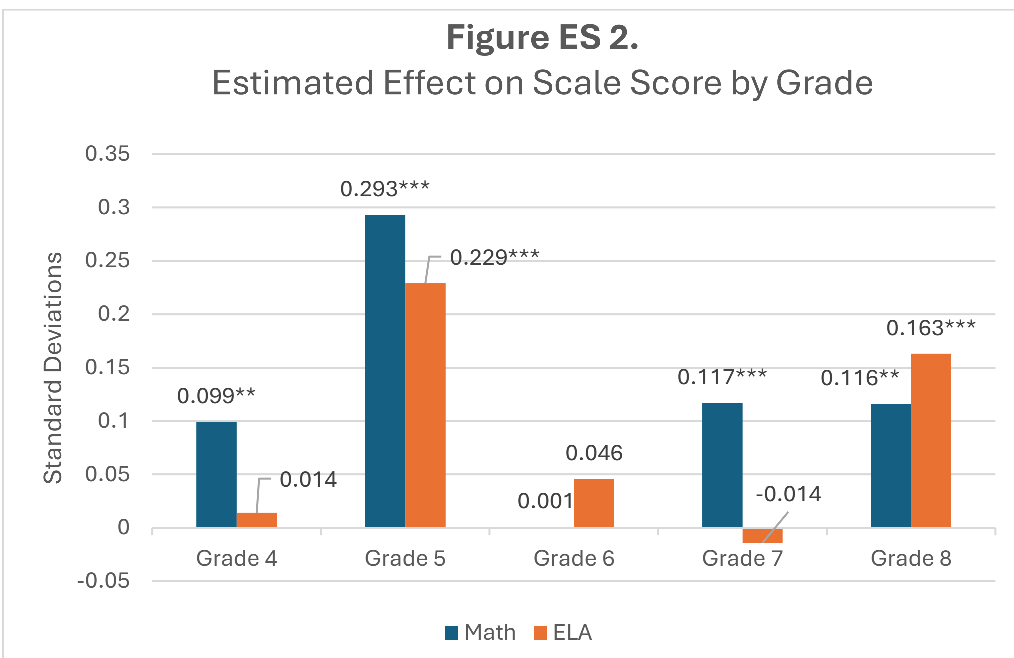

*Figure ES 2: Charter students showed the largest gains in Grade 5, with improvements in Grades 4, 7, and 8. Statistically significant results are denoted by *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.*

- **Equity findings**:
  - Charter schools appear to provide strong benefits for historically underserved groups.
  - **Black and Latinx students**, **students eligible for Free and Reduced-Price Lunch (FRPL)**, and **students with disabilities (SWD)** all showed larger improvements than their peers.
  - For example, FRPL-eligible students improved by **0.16 standard deviations in math** (with strong statistical significance) compared to their non-FRPL counterparts who improved by 0.046 (with no statistical significance).

- **Limitations**:
  - Because this analysis relies on selecting a comparison group using observable characteristics, the results may be biased if there are unobservable differences, such as student motivation or engagement, between charter school students and their matched peers.
  - Because the Washington Comprehensive Assessment of Science does not take place yearly, estimation of charter school effects on science performance are exploratory only.
  - The presented estimates represent the **upper bound of potential charter school effects** and should be interpreted cautiously.
  - The analysis does not account for length of charter school attendance, which may affect outcomes.

Implications

Closing Gaps

Underserved groups saw some of the greatest gains.
Black students: +0.14 in math
Latinx students: +0.16 in math
FRPL eligible students: +0.16 in math
SWD: +0.18 in ELA

These results suggest that Washington charter schools are having a positive impact on student achievement, particularly for certain subgroups. At the same time, methodological limitations and grade-level variation underscore the need for cautious interpretation. Changes in student performance depend upon a variety of factors, not least of which is the school they attend. Policymakers may wish to consider both the promising evidence for equity gains and the study's constraints when evaluating the role of charter schools in Washington's public education system.

Introduction

Academic Performance of Charter School Students and Similar Students

Given the differences in curriculum and pedagogy between charter schools and other public schools (OPS), it is important to know what, if any, benefits charters have for students. This report focuses on the difference in test performance for charter school students and a matched group of students from other public schools. It finds that students improve in both math and ELA test performance across a variety of grades and subgroups, including race and gender. While there is a need for further evaluation and analysis, these results point towards charter schools as a potentially effective path for helping students; as such, charters warrant further consideration.

Methods

Study Design (Nearest Neighbor, Mahalanobis)

RCW 28A.710.250 requires a comparison of charter school student performance with comparable students in other public schools. These students are to be similar across academic, ethnic, and socioeconomic characteristics. The best method to establish estimates of the effect of entering a charter school would be to compare the educational outcomes of students randomly assigned to a charter school with those same outcomes of students randomly assigned to a school in the other public schools (OPS) category. The random assignment would ensure that, on average, predetermined observable and unobservable characteristics of students would be the same in both groups. In particular, it would help to control for differences in either student motivation or parent involvement, as evidenced by their willingness to actively seek alternatives to OPS (Sass et al., 2016). Given the infeasibility of random assignment in the present context, this study instead employs a nearest neighbor one-to-one matching approach. Specifically, it constructs a comparison group of OPS students who are observably similar to charter school students across individual characteristics. The method used is Mahalanobis matching (otherwise referred to as covariate matching), which allows for the creation of an observably similar comparison group from among OPS. The same approach has been commonly used in studies of charter schools as well as in evaluations of policies and programs in fields such as health, economics, and the social sciences (Sass et al., 2016; Stuart, 2010; Sun & Loeb, 2021). The method is particularly appropriate in settings where balance is set on a limited number of characteristics (Stuart, 2010).

In the context of charter schools and standardized testing, the most important characteristic is the baseline test scores of students. While only observable characteristics can be matched to construct comparison groups, prior research has found that the incorporation of such characteristics alongside pretreatment assessment scores often produces similar estimates of efficacy rates as those estimated from randomized lottery settings (Bifulco, 2010; Fortson et al., 2012; Gill et al., 2013). The researchers cited here highlight that estimates from matched studies are often unreliable when pretreatment assessments are not accounted for in the matching process.

Limitations of the Analysis

Although Mahalanobis matching with the inclusion of prior test scores is likely to provide the most reliable, rigorous, and transparent estimate of charter school effects with the available data, the estimated effects of charter schools may be biased in this study. The matching allows for comparisons in outcomes only between students who are observably similar, but it cannot address unobservable differences, such as motivation and parental support. Given the time and resources required to apply, transfer, and/or commute to a charter school, it is possible charter school students are still different in unobservable traits from their matched OPS counterparts. An unobserved ability to overcome barriers is likely to be correlated with better performance. This would be a potential source of upward bias on the estimates here, which means that the estimates should be treated as the upper bound of potential charter effects on test performance.

In addition, this analysis is not able to provide insights in the difference between students who attend charter schools for longer periods of time versus those who attend for shorter periods of time. This is because we are not able to observe the history of a student's attendance at a charter school over their academic career. Students who pursue charter school education earlier may differ in unobserved ways from those students who make the decision to enter the charter system later. If charter schools have an impact on student performance, then we would expect that a longer time within charter schools would only serve to strengthen this relationship.

Finally, while our impact estimates that rely on prior test scores (primarily for grades 4 through 8) may be comparable to those generated from a randomized lottery setting, estimates that do not account for prior test scores may be substantially less reliable. This includes estimates for 3rd and 10th graders, as well as for the 5th and 8th grade science tests, which should be considered exploratory. Because prior test data are unavailable for these grades, we cannot control for differences in student ability and motivation in the same way as for the other estimates.

Data

Data Sources

This study relies on student-level data from the Comprehensive Education Data and Research System (CEDARS). CEDARS incorporates the data provided by each school district within Washington to the Office of Superintendent of Public Instruction (OSPI). The data used for this study include enrollment, demographic information, test performance, and program participation.

Sample Description

Our sample consists of students from 14 of the 18 charter schools in the state and their matched OPS counterparts.[1] Other public school (OPS) students are potentially drawn from any OPS in Washington state, so long as they matched the grade level of their charter counterpart. Charter and OPS students are limited to those who participated in, and received a score for, their grade level assessment in the 2023–2024 school year. Students who were missing demographic information, had no days of attendance at their enrolled school, who had a missing score in the subject being matched, or, for Grades 4 through 8, were missing their previous year's score were excluded from the analysis.

Critically, our data includes both the current and previous scores of students in Grades 4 through 8 for the Smarter Balanced Assessments (SBA) in math and ELA. Additionally, the data has students' results in Grades 3 and 10 for math and ELA as well as their performance in Grades 5 and 8 on the Washington Comprehensive Assessment of Science (WCAS). This means that the use of prior scores to control for unobserved differences in ability is possible only for our evaluation of math and ELA for Grades 4 through 8. As mentioned in the method section, this is notable because prior research has uncovered that our method of analysis (e.g., without random assignment) are unlikely to be reliable without prior scores.

Student Characteristics

Student demographic information includes the following:

- Free and Reduced-Price Lunch (FRPL) eligibility
- primary language (English or Spanish)
- students with disabilities (SWD)
- race/ethnicity
- gender

These characteristics were chosen due to their stability throughout a student's life and therefore work best as pre-charter school characteristics. For our analysis, they are the only matching characteristics for students in Grades 3 and 10, and they are used in addition to previous test scores for Grades 4 through 8.

[1] Rooted Vancouver and Impact Black River opened in 2023–2024 and were not included as a result. Innovation High School students did not have a record of their number of cumulative days present in the data used and thus were also excluded. Lumen High School students within our grades of analysis did not have a prior test score and also were excluded. A full list of the schools included in the analysis and the grades they cover is included in Appendix A.

Test Characteristics

Students are expected to take the Smarter Balanced Assessments (SBA) in both math and ELA tests in every grade from 3rd through 8th and in Grade 10. For science, they take the Washington Comprehensive Assessment of Science (WCAS) tested in the 5th, 8th, and 11th grades.

For each SBA test, a scale score of approximately 2300 to 2800 is computed for a student for math and ELA.[2] A scale score between 2430 and 2620 is required to meet standards, with the exact cutoff depending on subject and grade level. For WCAS, all grades require a scale score of 700 to meet standards.[3]

To interpret effect sizes and to address differences in the calculation of scale scores and thresholds among grades, we standardize all test scores for the 2023–2024 school year within grade level and subject to have a mean of 0 and standard deviation (SD) of 1. This means that the average performance for a student in a given subject and grade equals 0, and each increase or decrease of 1 unit represents performance one SD above or below the average for that grade. Table 1 presents the standard deviations of each grade's test scores for the entire student population in the data set. From this, it's evident that a 1 standard deviation increase in a 5th-grade math test score performance corresponds to an increase of approximately 107 scale-score points, while a 1 standard deviation increase of an 8th-grade reading performance corresponds to an improvement of about 114 points.

Table 1. Test Scores by Grade Level for All Washington Students

Grade Level	**Math**		**ELA**	
	Mean	S.D.	Mean	S.D.
4th	2,477	99.91	2,468	106.12
5th	2,502	107.46	2,507	109.06
6th	2,511	120.35	2,519	104.75
7th	2,528	125.77	2,547	111.61
8th	2,536	133.76	2,556	114.31

Matching

Process for Constructing Matched Samples

Matches were assessed by comparing the observable characteristics of charter school students with those of their matched OPS counterparts. Following prior studies, student characteristics are evaluated to see if they have a statistically significant difference between the treatment and

[2] Scale Scores State Assessments and their exact cutoffs can be seen here.

[3] Exact cutoffs for each grade level may be found at https://ospi.k12.wa.us/student-success/testing/state-testing/state-testing-scores-and-reports/scale-scores-state-assessments

matched control (Becker & Ichino, 2002; Bifulco, 2010; Gleason et al., 2014). If charter school students are observably similar to their matched OPS counterparts, this provides confidence that the matching process was well executed and that selection bias between treatment and control groups has been minimized.

The matching characteristics used for this study include race, gender, primary language of the student, and FRPL eligibility status, as well as previous test scores where possible. The study also required an exact match of grade level of a charter student and their OPS counterpart, as standardized tests have differing scoring depending on grade.

Once matched samples were constructed, differences in student outcomes between charter school students and their matched OPS counterparts were evaluated to estimate charter school effectiveness. The outcome used to measure effectiveness was student performance on standardized tests. Student test performance is commonly used as an indicator of school effectiveness (e.g., Ackerman & Egalite, 2017; Baude et al., 2014; CREDO, 2013; Fortson et al., 2012; Hanushek et al., 2007). This approach follows prior studies of charter schools that employed one-to-one matching to evaluate the impact of charter school attendance on academic performance (Warner & Bluestone, 2018). Statistical significance was estimated using Abadie & Imbens's robust standard errors, which are specifically designed to accommodate the Mahalanobis matching approach implemented in this analysis (Abadie & Imbens, 2006, 2011).

Impact Model

After matching charter students and their OPS counterparts, charter school impact effects were estimated through a regression model which included student characteristics as covariates. While matching results in observable similar characteristics between the two groups, the inclusion of these characteristics improves the precision of the estimates and control for any remaining differences in the matched sample. Due to differences in sample sizes for the various subgroups, regression estimates are constrained to those of an adequate size for statistical analysis. This was done to ensure that the precision of estimates were consistent between groups.

The following model was utilized for the overall 4th through 8th grade math and ELA sample:

$$y_i = \beta Charter_i + \delta' X_i + \varepsilon_i \qquad (1)$$

where y_i is the outcome of interest for student i; $Charter_i$ indicate a student being in a charter school in the 2023-24 school year; X_i is the vector of student characteristics for student i, ε_i is the error term;. β is the coefficient of interest and represents the impact of charter school attendance on test performance in terms of scale score or meeting standards on a given standardized test.

Balance Tests and Comparability of Groups

Table 2 shows that the matched sample achieved good balance, with no statistically significant differences between the treatment and control group for any variable, including prior ELA and math scores. In addition to statistical significance, Table 2 reports the mean values and differences in characteristics between OPS and charter school students in the analytic sample for Grades 4 through 8.

Table 2. Mean Values of Student Characteristics for Charter Students and their matched OPS counterparts (Grades 4 through 8)

	Math			ELA		
	Charter	OPS	Diff	Charter	OPS	Diff
Standardized Prior Test Score	-0.021	-0.020	-0.002	-0.042	-0.044	0.002
FRPL	0.608	0.608	0.000	0.613	0.613	0.000
Primary Language: English	0.755	0.755	0.000	0.755	0.755	0.000
Primary Lanaguage: Spanish	0.113	0.113	0.000	0.112	0.112	0.000
Students with Disabilities	0.159	0.159	0.000	0.156	0.156	0.000
American Indian/Alaskan Native	^	^	^	^	^	^
Asian	0.059	0.059	0.000	0.058	0.058	0.000
Black	0.255	0.255	0.000	0.256	0.256	0.000
Latinx	0.220	0.220	0.000	0.219	0.219	0.000
Native Hawaiian/Other Pacific Islander	0.005	0.005	0.000	0.005	0.005	0.000
White	0.364	0.364	0.000	0.365	0.365	0.000
Male	0.512	0.512	0.000	0.514	0.514	0.000
Number of Students	1,394	1,394		1,402	1,402	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

This balance table also provides insights into the composition of students attending charter schools and their matched OPS counterparts. Approximately 61% of students in both groups are eligible for FRPL and 16% are students with disabilities (SWD)[4]. The racial composition of both groups is also diverse, with the largest group being White students, who make up approximately 36% of the student population, followed by Black students (26%) and Latinx students (22%). In comparison, the racial composition of OPS students is 48% White, 5% Black, and 26% Latinx.[5] (The American Indian/Alaskan Native and Native Hawaiian/Pacific Islander populations are too small for potential effects to be directly calculated; their demographic information is therefore suppressed.)

Results

Evaluating test score changes across grade levels and test forms presents challenges because standardized tests often differ in scoring schemes and ranges by grade, subject, or testing

[4] This includes all students who are recorded as disabled and have been assessed for the special education program.
[5] All population-level characteristics are shown in Table A19 of Appendix A.

organization. To address these differences, expressing changes in student performance in terms of standard deviation units allows for more meaningful comparisons between education programs. Effect sizes for achievement outcomes can be interpreted as small (less than 0.05 SD), medium (0.05 to < 0.20 SD), and large (greater than or equal to 0.20 SD; Kraft, 2020).

For reference, Table 1 presents the standard deviation of each test. A hypothetical increase of 0.12 standard deviations in math for a 5th grader corresponds to an increase of approximately 13 points in the test scale score. For meeting standards, the results represent the increase in the probability that a student meets the standard on the given test on average. Thus, an estimate of 0.05 indicates that, on average, a student attending a charter school has a 5-percentage-point higher probability of meeting standards on a standardized test compared with a similar student attending an OPS. This increase is in addition to the student's original probably of meeting standards. For example, if an OPS student originally had a 50% probability of meeting standards, attendance at a charter school would raise that probability to 55% on average.

Overall Effects on Student Achievement

Table 3 reports the estimated effects of charter school attendance on math and ELA test performance. Students attending charter schools are estimated to score 0.115 and 0.081 standard deviations higher than OPS students on the math and ELA tests, respectively. Figure 1 illustrates these results, while Figure 2 translates them into approximate scale-score effects for 4th-grade students, using standard deviations of 100 for math and 106 for ELA (as reported in Table 1 and rounded to the nearest point). These correspond to estimated average improvements of 11.50 points in math and 8.59 points in ELA for 4th graders.

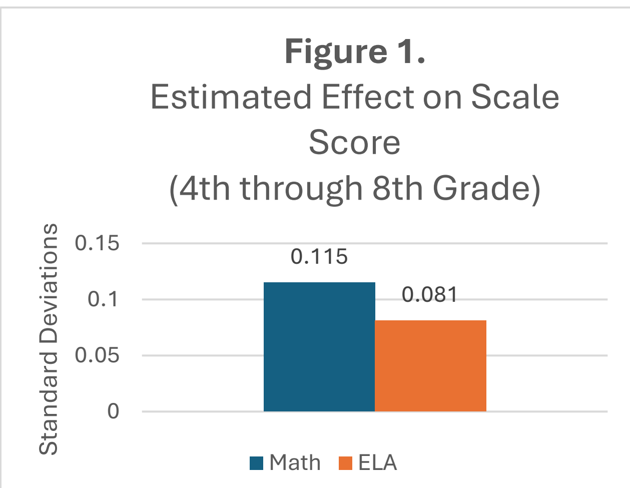

Figure 1: Estimated effect of charter school attendance on math and ELA test performance (Grades 4–8).

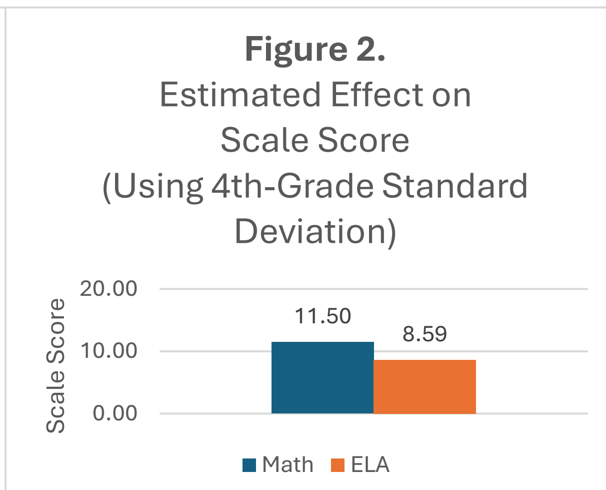

Figure 2: Estimated effect of charter school attendance on math and ELA test performance expressed in scale-score points (using 4th-grade standard deviations).

A similar effect is estimated for meeting standards, with a 6.1 percentage point increase for math, and 5.2 percentage points for ELA, as seen in both Table 3 and Figure 3.

Policy Implications

While the gains in test performance are modest, they suggest that charter schools are helping students make measurable progress in both math and ELA in terms of overall test performance and meeting state standards.

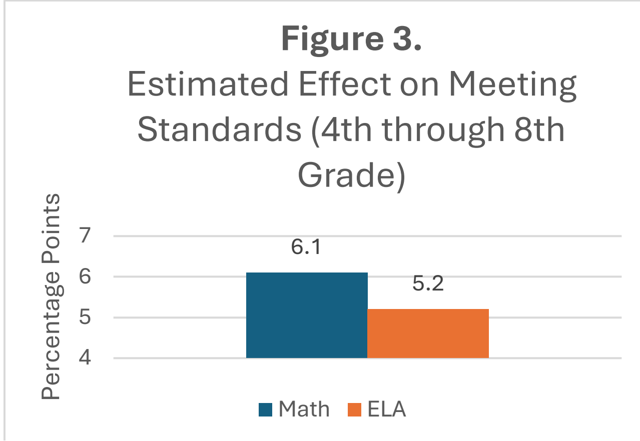

Figure 3: Estimated effect of charter school attendance on the probability of meeting state standards in math and ELA (Grades 4–8).

Table 3. Estimated Charter School Effects by Subject (Grades 4 through 8)

	Math		ELA	
	Test Score	Met Standards	Test Score	Met Standards
Estimated Effect	0.115*** (0.021)	0.061*** (0.013)	0.081*** (0.023)	0.052*** (0.014)
Number of Students	2,788	2,788	2,804	2,804

*Notes : *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: prior test score in subject, free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if either current or prior year test score are not available.*

Grade Level Effects

Table 4 presents grade-level estimates, showing a range from 0.001 to 0.293 standard deviation increases in math performance and a range from -0.014 to 0.229 in ELA. The negative effect is not statistically significant. In contrast, math scores for Grades 4, 5, 7, and 8 and ELA scores for Grades 5 and 8 show positive, statistically significant effects. The overall charter school effect on tests appears to be driven primarily by 5th-grade students, who exhibit effects greater than 0.20 standard deviations in both subjects.

Policy Implications

These results indicate that charter schools might have more consistent benefits for math performance, while having no statistically significant downside for ELA. Additionally, the detected effects are consistently either medium or large in terms of substantive effect.

Table 4. Estimated Charter School Effects on Test Performance by Grade

	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Panel A: Math					
Estimated Effects	0.099**	0.293***	0.001	0.117***	0.116**
	(0.045)	(0.045)	(0.045)	(0.044)	(0.047)
Number of Students	490	454	670	650	524
Panel B: ELA					
Estimated Effect	0.014	0.229***	0.046	-0.014	0.163***
	(0.053)	(0.058)	(0.047)	(0.044)	(0.055)
Number of Students	490	458	664	660	532

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: prior test score in subject, free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if either current or prior year test score are not available.*

The effects for Grades 4, 7, and 8 in math are smaller, ranging from 0.099 and 0.117 standard deviation increases, while the 8th-grade increase in ELA is 0.163.

Probability of Meeting Standards

Policy Implications

These results reinforce the evidence of improved student test performance and indicate that gains may extend beyond the grades in which measurable score improvements were observed.

The finding that the overall effect is driven by 5th-grade improvement is further supported by Table 5 which shows that 5th-grade students are 15.0 and 10.9 percentage points more likely to meet standards in math and ELA, respectively. Charter school students in Grades 7 and 8 also show an increased likelihood of meeting standards in math, and students in Grades 6 and 8 are more likely to meet standards in ELA.

Table 5. Estimated Charter School Effects on Meeting Test Standards by Grade Level

	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Panel B: Math					
Estimated Effects	0.033	0.150***	0.012	0.068**	0.065**
	(0.029)	(0.034)	(0.025)	(0.029)	(0.029)
Number of Students	490	454	670	650	524
Panel B: ELA					
Estimated Effects	-0.004	0.109***	0.072***	-0.003	0.083***
	(0.033)	(0.035)	(0.027)	(0.029)	(0.032)
Number of Students	490	458	664	660	532

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: prior test score in subject, free and/or reduced price lunch status, primary language, disabled, race, and gender. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if either current or prior year test score are not available.*

Subgroup Analysis

We also observe benefits of attending a charter school when focusing on key subgroups. Table 6 reports estimated impact on student test scores for charter school attendance based on race, gender, disability, and eligibility for FRPL. Due to sample size constraints, we are not able to estimate results for American Indian and Alaskan Native, Asian, and Native Hawaiian and Other Pacific Islander students. Estimates of improved student test performance range from 0.046 to 0.176 standard deviations, with only the estimated improvement for students with disabilities and non-FRPL eligible students in math having statistically insignificant estimates.

> **Policy Implications**
>
> These results point towards charter schools as a potential source of improvement, both in direct test results, as well as for those students who would otherwise not meet state standards in their testing.

Notably, Black and Latinx, girls (ELA only), SWD (ELA only), and FRPL-eligible (math only) students show higher estimated improvements than their subgroup counterparts. Among these groups, Black and Latinx students (0.143 and 0.164 standard deviation increase) and FRPL-eligible improvement (a 0.160 standard deviation increase) demonstrate the largest gains in math performance, while SWD improve by 0.176 standard deviations on ELA tests. Table 7 presents changes in the probability of meeting standards for each subgroup, showing that Black and Latinx students, girls, FRPL eligible students all improve at greater rates than their peers. SWD show a similar increase in probability of meeting ELA standards (5.0 percentage points versus 5.1 percentage points for students without disabilities) but no increase in their probability of meeting math test standards.

Table 6. Estimated Charter School Effects on Test Performance by Subgroup
(Grades 4 through 8)

	Black	Latinx	White	Female	Male	Non-SWD	SWD	Non-FRPL	FRPL
Panel A: Math									
Estimated Effect	0.143***	0.164***	0.080**	0.095***	0.132***	0.116***	0.097	0.046	0.160***
	(0.042)	(0.045)	(0.033)	(0.029)	(0.029)	(0.021)	(0.062)	(0.032)	(0.027)
Number of Students	712	614	1,016	1,360	1,428	2,346	442	1,092	1,696
Panel B: ELA									
Estimated Effect	0.077*	0.152***	0.033	0.082***	0.081**	0.061**	0.176***	0.095***	0.072**
	(0.046)	(0.050)	(0.038)	(0.032)	(0.033)	(0.024)	(0.062)	(0.035)	(0.030)
Number of Students	718	614	1,024	1,364	1,440	2,366	438	1,086	1,718

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: prior test score in subject, free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if either current or prior year test score are not available.*

Table 7. Estimated Charter School Effects on Meeting Test Standards by Subgroup (Grades 4 through 8)

	Black	Latinx	White	Female	Male	Non-SWD	SWD	Non-FRPL	FRPL
Panel A: Math									
Estimated Effect	0.073***	0.062**	0.043**	0.069***	0.050***	0.069***	0.009	0.037*	0.078***
	(0.026)	(0.028)	(0.022)	(0.019)	(0.018)	(0.015)	(0.021)	(0.021)	(0.017)
Number of Students	712	614	1,016	1,360	1,428	2,346	442	1,092	1,696
Panel B: ELA									
Estimated Effect	0.059**	0.088***	0.020	0.062***	0.044**	0.051***	0.050*	0.052**	0.052***
	(0.028)	(0.027)	(0.024)	(0.021)	(0.018)	(0.016)	(0.029)	(0.022)	(0.018)
Number of Students	718	614	1,024	1,364	1,440	2,366	438	1,086	1,718

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: prior test score in subject, free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if either current or prior year test score are not available.*

Discussion

Interpretation of Effect Sizes

The study's statistically significance effects (across Grades 4 through 8, individual grade levels, and subgroup estimates) are consistently medium to large in magnitude, with most above 0.05 standard deviations and some exceeding 0.20. All of these effects are positive. Although a few estimates are negative, they are statistically insignificant and should be interpreted as effectively zero. The primary estimates for Grades 4 through 8, where prior scores provide the best match and most accurately account for ability, are highly statistically significant and represent both improved test performance and a higher probability of meeting state standards. The test performance estimates (0.115 and 0.081 standard deviation increases in math and ELA respectively), fall within the medium range. The substantive significance of these findings is underscored by the increased probability of meeting state standards. Charter school students demonstrate improved test performance that enables them to meet necessary benchmarks more consistently across math and ELA testing.

Equity Implications

Improvements in test scores and higher probabilities of meeting standards are observed for most student subgroups, with historically underserved students (Black and Latinx students, girls, students with disabilities, and FRPL-eligible students) often showing greater gains. The magnitude of these improvements varies, ranging from nearly identical to notably higher gains compared with their peers. In some cases, as with gender and disability, performance trends follow historical patterns. Overall, charter schools appear capable of improving outcomes for underserved groups, but the mechanisms driving these gains (and the extent to which they can be expanded) warrant further investigation.

Caveats and Caution in Interpretation

The analysis finds that charter schools, on the whole, have a positive impact on student test performance. Across grades, subgroups and aggregate measures, the estimates with the highest statistical confidence indicate improvements in performance. However, the available data do not allow for controls related to the length of student enrollment in charter schools or potential differences in parental involvement and student motivation that might be associated with charter school attendance. Given these limitations, the estimates should be interpreted as representing the upper bounds of potential effects. The lack of declines in student performance is promising, but the resulting benefits might be lower than anticipated.

Conclusion

Charter school performance represents crucial information for students and families attempting to make the best educational choice possible. Improved performance among charter school students, especially across historically underserved groups, could signal that charter schools offer one viable pathway for enhancing student outcomes. These results align with similar findings in previous reports on Washington charter schools, which have shown that charter school students perform at or above the level of their OPS counterparts.

Further investigation into the factors driving these performance differences between charter and OPS students would be valuable. Key questions include whether charter students differ in unobserved ways and whether particular school practices, policies, or resources account for the gains. Addressing such questions could help educators and policymakers identify strategies to better support students across all school settings.

Glossary

Abadie & Imbens Robust Standard Errors
A method of calculating standard errors that accurately accounts for matching, in particular Mahalanobis nearest neighbor matching, allowing for proper calculations of statistical significance.

Baseline Test Scores
A student's test results from the 2022–2023 school year, used to account for prior academic achievement when comparing charter students against their OPS counterparts.

Charter School
A public school that operates independently of a school district, under a performance contract (or "charter") that outlines its mission, program, and goals.

Comprehensive Education Data and Research System (CEDARS)
Washington State's longitudinal student data system, maintained by the Office of Superintendent of Public Instruction (OSPI).

Effect Size (Standard Deviation Units)
A way to measure changes in test scores that makes results comparable across different grades, tests, and studies. For example, a 0.10 effect size means a student scored one-tenth of a standard deviation above the average for the assessment that they participated in.

Free and Reduced-Price Lunch (FRPL)
A federal program that provides low-cost or free school meals to students from low-income families. FRPL eligibility is commonly used as a measure of socioeconomic status.

Mahalanobis Nearest-Neighbor Matching
A statistical method used to pair observations from two groups together based on observable characteristics. This study uses it to pair charter school students with similar students in other public schools (OPS) based on characteristics like race, gender, income, and prior test scores. Doing so allows for the creation of a comparable group when randomized trials are not feasible or desirable.

Matches are based on minimizing the "distance" between two observations, with an emphasis on the closest match across all characteristics without any modification/adjustment by the researcher.

Office of Superintendent of Public Instruction (OSPI)
The state agency overseeing K–12 public education in Washington.

Other Public Schools (OPS)
All non-charter public schools, used as the comparison group in this study.

Scale Score
A score on a standardized test that allows comparison across different versions of the test. For the Smarter Balanced Assessments (SBA), scale scores typically range from 2300 to 2800.

Smarter Balanced Assessment (SBA)
Washington’s statewide test in math and English Language Arts (ELA), administered annually in Grades 3–8 and 10.

Standard Deviation (SD)
A statistical measure of how spread-out scores are around the average. In this report, test results are expressed in standard deviation units so that results can be compared across grades and subjects.

Washington Comprehensive Assessment of Science (WCAS)
Washington’s statewide science test, administered in grades 5, 8, and 11.

Appendix A: Balance Tables and Summary Statistics

The tables below provide the characteristics of matched charter and OPS students, both for Grades 3 and 10 combined and for each individual grade. For WCAS, Grades 5 and 8 are matched both as a combined group and separately by grade for exploratory analysis. The final tables provide summary statistics for the full student population included in the original data set, as well as the average test scores for the matched samples by grade and subgroup.

Table A1. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grades 3 and 10)

	Math			ELA		
	Charter	TPS	Diff	Charter	TPS	Diff
Male	0.457	0.455	0.002	0.452	0.450	0.002
Primary Language: English	0.805	0.805	0.000	0.810	0.810	0.000
Primary Lanaguage: Spanish	0.065	0.065	0.000	0.062	0.062	0.000
Students with Disabilities	0.156	0.156	0.000	0.154	0.154	0.000
American Indian/Alaskan Native	^	^	^	^	^	^
Asian	0.047	0.047	0.000	0.046	0.046	0.000
Black	0.308	0.308	0.000	0.307	0.307	0.000
Latinx	0.181	0.181	0.000	0.179	0.179	0.000
Native Hawaiian/Other Pacific Islander	^	^	^	^	^	^
White	0.343	0.343	0.000	0.344	0.344	0.000
FRPL	0.647	0.650	-0.004	0.649	0.652	-0.004
Number of Students	569	569		564	564	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A2. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grades 5 and 8: Science Test)

	Charter	OPS	Diff
Male	0.529	0.529	0.000
Primary Language: English	0.748	0.748	0.000
Primary Lanaguage: Spanish	0.113	0.113	0.000
Students with Disabilities	0.156	0.156	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.056	0.056	0.000
Black	0.299	0.299	0.000
Latinx	0.213	0.213	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.336	0.336	0.000
FRPL	0.603	0.603	0.000
Number of Students	539	539	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A3. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 4: Math Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.001	0.002	-0.003
FRPL	0.669	0.669	0.000
Primary Language: English	0.812	0.812	0.000
Primary Lanaguage: Spanish	0.057	0.057	0.000
Students with Disabilities	0.143	0.143	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.069	0.069	0.000
Black	0.237	0.237	0.000
Latinx	0.204	0.204	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.371	0.371	0.000
Male	0.490	0.490	0.000
Number of Students	245	245	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A4. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 5: Math Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.020	-0.023	0.003
FRPL	0.665	0.665	0.000
Primary Language: English	0.749	0.749	0.000
Primary Lanaguage: Spanish	0.115	0.115	0.000
Students with Disabilities	0.145	0.145	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.053	0.053	0.000
Black	0.286	0.286	0.000
Latinx	0.260	0.260	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.300	0.300	0.000
Male	0.493	0.493	0.000
Number of Students	227	227	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A5. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 6: Math Test)

	Charter	OPS	Diff
Standardized Prior Test Score	0.020	0.021	-0.002
FRPL	0.546	0.546	0.000
Primary Language: English	0.758	0.758	0.000
Primary Lanaguage: Spanish	0.116	0.116	0.000
Students with Disabilities	0.179	0.179	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.051	0.051	0.000
Black	0.236	0.236	0.000
Latinx	0.236	0.236	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.406	0.406	0.000
Male	0.466	0.466	0.000
Number of Students	335	335	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A6. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 7: Math Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.070	-0.061	-0.009
FRPL	0.606	0.606	0.000
Primary Language: English	0.729	0.729	0.000
Primary Lanaguage: Spanish	0.138	0.138	0.000
Students with Disabilities	0.151	0.151	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.058	0.058	0.000
Black	0.218	0.218	0.000
Latinx	0.222	0.222	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.375	0.375	0.000
Male	0.535	0.535	0.000
Number of Students	325	325	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A7. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 8: Math Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.033	-0.038	0.004
FRPL	0.584	0.584	0.000
Primary Language: English	0.737	0.737	0.000
Primary Lanaguage: Spanish	0.126	0.126	0.000
Students with Disabilities	0.168	0.168	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.065	0.065	0.000
Black	0.317	0.317	0.000
Latinx	0.179	0.179	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.347	0.347	0.000
Male	0.580	0.580	0.000
Number of Students	262	262	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A8. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 4: ELA Test)

	Charter	OPS	Diff
Standardized Prior Test Score	0.010	0.005	0.005
FRPL	0.669	0.669	0.000
Primary Language: English	0.812	0.812	0.000
Primary Lanaguage: Spanish	0.057	0.057	0.000
Students with Disabilities	0.143	0.143	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.069	0.069	0.000
Black	0.233	0.233	0.000
Latinx	0.204	0.204	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.376	0.376	0.000
Male	0.494	0.494	0.000
Number of Students	245	245	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A9. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 5: ELA Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.106	-0.102	-0.003
FRPL	0.659	0.659	0.000
Primary Language: English	0.751	0.751	0.000
Primary Lanaguage: Spanish	0.114	0.114	0.000
Students with Disabilities	0.144	0.144	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.052	0.052	0.000
Black	0.288	0.288	0.000
Latinx	0.258	0.258	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.301	0.301	0.000
Male	0.498	0.498	0.000
Number of Students	229	229	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A10. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 6: ELA Test)

	Charter	OPS	Diff
Standardized Prior Test Score	0.097	0.095	0.003
FRPL	0.554	0.554	0.000
Primary Language: English	0.756	0.756	0.000
Primary Lanaguage: Spanish	0.117	0.117	0.000
Students with Disabilities	0.181	0.181	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.048	0.048	0.000
Black	0.235	0.235	0.000
Latinx	0.235	0.235	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.410	0.410	0.000
Male	0.464	0.464	0.000
Number of Students	332	332	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A11. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 7: ELA Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.142	-0.140	-0.002
FRPL	0.615	0.615	0.000
Primary Language: English	0.727	0.727	0.000
Primary Lanaguage: Spanish	0.136	0.136	0.000
Students with Disabilities	0.145	0.145	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.058	0.058	0.000
Black	0.218	0.218	0.000
Latinx	0.218	0.218	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.376	0.376	0.000
Male	0.533	0.533	0.000
Number of Students	330	330	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A12. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 8: ELA Test)

	Charter	OPS	Diff
Standardized Prior Test Score	-0.086	-0.092	0.007
FRPL	0.590	0.590	0.000
Primary Language: English	0.741	0.741	0.000
Primary Lanaguage: Spanish	0.124	0.124	0.000
Students with Disabilities	0.162	0.162	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.064	0.064	0.000
Black	0.323	0.323	0.000
Latinx	0.180	0.180	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.342	0.342	0.000
Male	0.583	0.583	0.000
Number of Students	266	266	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A13. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 3: Math Test)

	Charter	OPS	Diff
FRPL	0.651	0.657	-0.006
Primary Language: English	0.822	0.822	0.000
Primary Lanaguage: Spanish	0.057	0.057	0.000
Students with Disabilities	0.130	0.130	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.066	0.066	0.000
Black	0.262	0.262	0.000
Latinx	0.178	0.178	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.373	0.373	0.000
Male	0.446	0.440	0.006
Number of Students	332	332	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A14. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 10: Math Test)

	Charter	OPS	Diff
FRPL	0.641	0.641	0.000
Primary Language: English	0.781	0.781	0.000
Primary Lanaguage: Spanish	0.076	0.076	0.000
Students with Disabilities	0.194	0.194	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.021	0.021	0.000
Black	0.371	0.371	0.000
Latinx	0.186	0.186	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.300	0.300	0.000
Male	0.473	0.477	-0.004
Number of Students	237	237	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A15. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 3: ELA Test)

	Charter	OPS	Diff
FRPL	0.653	0.659	-0.006
Primary Language: English	0.822	0.822	0.000
Primary Lanaguage: Spanish	0.057	0.057	0.000
Students with Disabilities	0.130	0.130	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.063	0.063	0.000
Black	0.263	0.263	0.000
Latinx	0.178	0.178	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.375	0.375	0.000
Male	0.444	0.438	0.006
Number of Students	331	331	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A16. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 10: ELA Test)

	Charter	OPS	Diff
FRPL	0.644	0.644	0.000
Primary Language: English	0.794	0.794	0.000
Primary Lanaguage: Spanish	0.069	0.069	0.000
Students with Disabilities	0.189	0.189	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.021	0.021	0.000
Black	0.369	0.369	0.000
Latinx	0.180	0.180	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.300	0.300	0.000
Male	0.464	0.468	-0.004
Number of Students	233	233	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A17. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 5: Science Test)

	Charter	OPS	Diff
FRPL	0.654	0.654	0.000
Primary Language: English	0.752	0.752	0.000
Primary Lanaguage: Spanish	0.106	0.106	0.000
Students with Disabilities	0.146	0.146	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.049	0.049	0.000
Black	0.285	0.285	0.000
Latinx	0.244	0.244	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.313	0.313	0.000
Male	0.484	0.484	0.000
Number of Students	246	246	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A18. Mean Values of Student Characteristics for Charter Students and Their Matched OPS Counterparts (Grade 8: Science Test)

	Charter	OPS	Diff
FRPL	0.560	0.560	0.000
Primary Language: English	0.744	0.744	0.000
Primary Lanaguage: Spanish	0.119	0.119	0.000
Students with Disabilities	0.164	0.164	0.000
American Indian/Alaskan Native	^	^	^
Asian	0.061	0.061	0.000
Black	0.311	0.311	0.000
Latinx	0.188	0.188	0.000
Native Hawaiian/Other Pacific Islander	^	^	^
White	0.355	0.355	0.000
Male	0.567	0.567	0.000
Number of Students	293	293	

*Note: *Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent; ^ indicates that student count is below reporting threshold (< 10).*

Table A19. Student Characteristics for all OPS Students

	Mean
Male	51%
Primary Language: English	76%
Primary Lanaguage: Spanish	14%
Students with Disabilities	15%
American Indian/Alaskan Native	1%
Asian	9%
Black	5%
Latinx	26%
Native Hawaiian/Other Pacific Islander	2%
White	48%
FRPL	51%
Number of Students	677,128

Table A20. Student Population Math Test Scores by Grade Level and Charter Enrollment

	Charter Students		**OPS Students**	
	Prior Year Score	Current Year Score	Prior Year Score	Current Year Score
3rd Grade	N/A	2,429.40	N/A	2,420.13
4th Grade	2,435.97	2,488.51	2,436.22	2,478.36
5th Grade	2,477.64	2,525.54	2,477.36	2,494.04
6th Grade	2,505.08	2,515.90	2,505.30	2,515.84
7th Grade	2,504.51	2,531.72	2,505.53	2,516.77
8th Grade	2,525.78	2,554.65	2,525.27	2,539.13
10th Grade	N/A	2,533.77	N/A	2524.03

Table A21. Student Population ELA Test Scores by Grade Level and Charter Enrollment

	Charter Students		**OPS Students**	
	Prior Year Score	Current Year Score	Prior Year Score	Current Year Score
3rd Grade	N/A	2,422.01	N/A	2,417.67
4th Grade	2,427.69	2,473.05	2,427.12	2,471.41
5th Grade	2,459.29	2,523.72	2,459.65	2,498.55
6th Grade	2,520.49	2,526.40	2,520.22	2,521.57
7th Grade	2,507.35	2,541.92	2,507.55	2,542.89
8th Grade	2,542.18	2,564.12	2,541.39	2,545.17
10th Grade	N/A	2,595.08	N/A	2,587.43

Table A22. Student Population Math Test Scores by Subgroup and Charter Enrollment (Grades 4 through 8)

	Charter Students		OPS Students	
	Prior Year Score	Current Year Score	Prior Year Score	Current Year Score
American Indian/Alaskan Native	^	^	^	^
Asian	2,521.83	2,570.37	2,523.71	2,558.52
Black	2,475.61	2,508.53	2,475.85	2,491.63
Latinx	2,466.85	2,499.20	2,466.97	2,480.58
Native Hawaiian/Other Pacific Islander	^	^	^	^
White	2,513.36	2,540.23	2,513.16	2,530.46
Female	2,484.44	2,515.61	2,484.80	2,505.01
Male	2,499.64	2,531.26	2,499.68	2,515.64
Non-SWD	2,508.69	2,541.58	2,508.66	2,528.30
SWD	2,404.84	2,428.33	2,405.62	2,416.41
Non-FRPL	2,527.01	2,557.96	2,528.12	2,552.72
FRPL	2,469.82	2,501.52	2,469.43	2,482.98

^ indicates student count is below reporting threshold (<10)

Table A23. Student Population ELA Test Scores by Subgroup and Charter Enrollment (Grades 4 through 8)

	Charter Students		OPS Students	
	Prior Year Score	Current Year Score	Prior Year Score	Current Year Score
American Indian/Alaskan Native	^	^	^	^
Asian	2,505.31	2,552.07	2,505.58	2,535.67
Black	2,482.99	2,512.04	2,482.03	2,504.47
Latinx	2,473.46	2,505.54	2,473.53	2,488.57
Native Hawaiian/Other Pacific Islander	^	^	^	^
White	2,515.40	2,546.53	2,515.39	2,542.35
Female	2,501.98	2,535.79	2,501.66	2,526.81
Male	2,488.98	2,519.55	2,488.89	2,510.61
Non-SWD	2,509.73	2,541.93	2,509.46	2,535.18
SWD	2,417.33	2,449.22	2,417.67	2,429.85
Non-FRPL	2,531.04	2,564.44	2,531.10	2,553.94
FRPL	2,472.71	2,504.07	2,472.34	2,496.15

^ indicates student count is below reporting threshold (<10)

Table A24. Percentage of Sample Student Population Meeting Standards in Math & ELA by Grade Level and Charter Enrollment (Grades 4 through 8)

	Charter Students		OPS Students	
	Math	ELA	Math	ELA
4th Grade	54.29	49.39	51.02	49.80
5th Grade	55.95	63.32	40.97	52.40
6th Grade	40.00	53.92	38.81	46.69
7th Grade	41.54	47.88	34.77	48.18
8th Grade	43.89	53.38	37.40	45.11
4th through 8th	46.20	53.14	40.10	47.93

Table A25. Student Population Count by Subgroup and Grade Level
(Matched Sample for Math)

	Grade Level					
Group	4th	5th	6th	7th	8th	Total
FRPL	328	302	366	394	306	1,696
Primary Language: English	398	340	508	474	386	2,106
Primary Language: Spanish	28	52	78	90	66	314
Students with Disabilities	70	66	120	98	88	442
American Indian/Alaskan Native	^	^	^	^	^	^
Asian	34	24	34	38	34	164
Black	116	130	158	142	166	712
Latinx	100	118	158	144	94	614
Native Hawaiian/Other Pacific Islander	^	^	^	^	^	14
White	*182*	*136*	*272*	*244*	182	1,016
Male	*240*	*224*	*312*	*348*	304	1,428

^ indicates that count was suppressed due to sample size restrictions (<10)

Table A26. Student Population Count by Subgroup and Grade Level
(Matched Sample for ELA)

	Grade Level					
Group	4th	5th	6th	7th	8th	Total
FRPL	328	302	368	406	314	1,718
Primary Language: English	398	344	502	480	394	2,118
Primary Language: Spanish	28	52	78	90	66	314
Students with Disabilities	70	66	120	96	86	438
American Indian/Alaskan Native	^	^	^	^	^	^
Asian	34	24	32	38	34	162
Black	114	132	156	144	172	718
Latinx	100	118	156	144	96	614
Native Hawaiian/Other Pacific Islander	^	^	^	^	^	14
White	184	138	272	248	182	1,024
Male	*242*	*228*	*308*	*352*	310	1,440

^ indicates that count was suppressed due to sample size restrictions (<10)

Table A27. Charter Schools Included in Analysis

School Name	Grades 4 through 8	Grades 3 and 10
Catalyst Public Schools	Yes	Yes
Impact: Black River	No	No
Impact: Commencement Bay Elementary	No	Yes
Impact: Puget Sound Elementary	Yes	Yes
Impact: Salish Sea Elementary	Yes	Yes
Innovation High School	No	No
Lumen High School	No	No
Pinnacles Prep	Yes	No
Pullman Community Montessori	Yes	Yes
Rainier Prep	Yes	No
Rainier Valley Leadership Academy	Yes	Yes
Rooted Vancouver	No	No
Spokane International Academy	Yes	Yes
Summit Public School: Atlas	Yes	Yes
Summit Public School: Olympus	No	Yes
Summit Public School: Sierra	No	Yes
Whatcom Intergenerational High School	No	Yes
Why Not You Academy	No	Yes

Appendix B: Additional Outcome Tables

These tables present exploratory estimates for 3rd and 10th grades (math and ELA tests) and for 5th and 8th grades (science). Because prior test scores are unavailable for these grades, students cannot be matched which can introduce bias into estimates.

Table B1. Estimated Charter School Effects by Subject
(Grades 3 and 10)

	Math		ELA		Science	
	Test Score	Met Standards	Test Score	Met Standards	Test Score	Met Standards
Estimated Effects	0.085*	0.058**	0.052	0.005	0.196***	0.106***
	(0.051)	(0.026)	(0.051)	(0.028)	(0.059)	(0.029)
Number of Students	1,138		1,128		1,078	

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current is not available.*

Table B2. Estimated Charter School Effects on Math Test Performance by Grade Level

	Grade 3	Grade 10
Panel A: Test Score		
Estimated Effects	0.095	0.071
	(0.065)	(0.082)
Number of Students	664	474
Panel B: Met Standards		
Estimated Effects	0.075**	0.034
	(0.035)	(0.039)
Number of Students	664	474

*Notes : *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, and gender. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current test score is not available.*

Table B3. Estimated Charter School Effects on ELA Test Performance by Grade Level

	Grade 3	Grade 10
Panel A: Test Score		
Estimated Effects	0.043	0.064
	(0.066)	(0.080)
Number of Students	662	466
Panel B: Met Standards		
Estimated Effects	0	0.013
	(0.035)	(0.044)
Number of Students	662	466

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, and gender. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current test score is not available.*

Table B4. Estimated Charter School Effects on Science Test Performance by Grade Level

	Grade 5	Grade 8
Panel A: Test Score		
Estimated Effects	0.253***	0.149*
	(0.079)	(0.087)
Number of Students	492	586
Panel B: Met Standards		
Estimated Effects	0.146***	0.072*
	(0.043)	(0.040)
Number of Students	492	586

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, and gender. Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current test score is not available.*

Table B5. Estimated Charter School Effects on Math Test Performance by Subgroup
(Grades 3 and 10)

	Black	Latinx	White	Female	Male	Non-SWD	SWD	Non-FRPL	FRPL
Panel A: Test Score									
Estimated Effect	0.084	0.139	0.145*	0.023	0.152**	0.042	0.318**	0.066	0.095
	(0.090)	(0.119)	(0.084)	(0.070)	(0.074)	(0.055)	(0.135)	(0.083)	(0.064)
Number of Students	350	206	390	618	520	960	178	402	736
Panel B: Met Standards									
Estimated Effect	0.046	0.078	0.067	0.023	0.092**	0.042	0.146***	0.070	0.0490
	(0.047)	(0.059)	(0.047)	(0.035)	(0.040)	(0.029)	(0.056)	(0.0450)	(0.032)
Number of Students	350	206	390	618	520	960	178	402	736

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current year test score is not available.*

Table B6. Estimated Charter School Effects on ELA Test Performance by Subgroup
(Grades 3 and 10)

	Black	Latinx	White	Female	Male	Non-SWD	SWD	Non-FRPL	FRPL
Panel A: Test Score									
Estimated Effect	-0.062	0.135	0.166**	-0.022	0.131*	0.015	0.254**	0.129	0.007
	(0.091)	(0.126)	(0.083)	(0.069)	(0.076)	(0.056)	(0.119)	(0.083)	(0.064)
Number of Students	346	202	388	618	510	954	174	396	732
Panel B: Met Standards									
Estimated Effect	-0.052	0.030	0.0620	-0.016	0.028	-0.025	0.172***	0.056	-0.025
	(0.052)	(0.064)	(0.044)	(0.037)	(0.040)	(0.030)	(0.061)	(0.041)	(0.036)
Number of Students	346	202	388	618	510	954	174	396	732

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current year test score is not available.*

Table B7. Estimated Charter School Effects on Science Test Performance by Subgroup
(Grades 5 and 8)

	Black	Latinx	White	Female	Male	Non-SWD	SWD	Non-FRPL	FRPL
Panel A: Test Score									
Estimated Effect	0.172	0.270**	0.269***	0.164*	0.225***	0.239***	-0.035	0.169*	0.214***
	(0.104)	(0.112)	(0.104)	(0.085)	(0.083)	(0.066)	(0.135)	(0.101)	(0.073)
Number of Students	322	230	362	508	570	910	168	428	650
Panel B: Met Standards									
Estimated Effect	0.106**	0.113*	0.133***	0.071	0.137***	0.110***	0.083	0.037	0.151***
	(0.052)	(0.060)	(0.051)	(0.044)	(0.039)	(0.033)	(0.059)	(0.048)	(0.037)
Number of Students	322	230	362	508	570	910	168	428	650

*Notes: *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Robust Abadie-Imbens standard errors are reported in parentheses. The following charactersitics are used as match criteria: free and/or reduced price lunch status, primary language, disabled, race, gender, and grade level (excluding the subgroup of interest for each column). Observations are the sum of charter students and their matched control observations (tied matches are broken via a randomly assigned value with a uniform distribution). Students are excluded if current year test score is not available.*

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