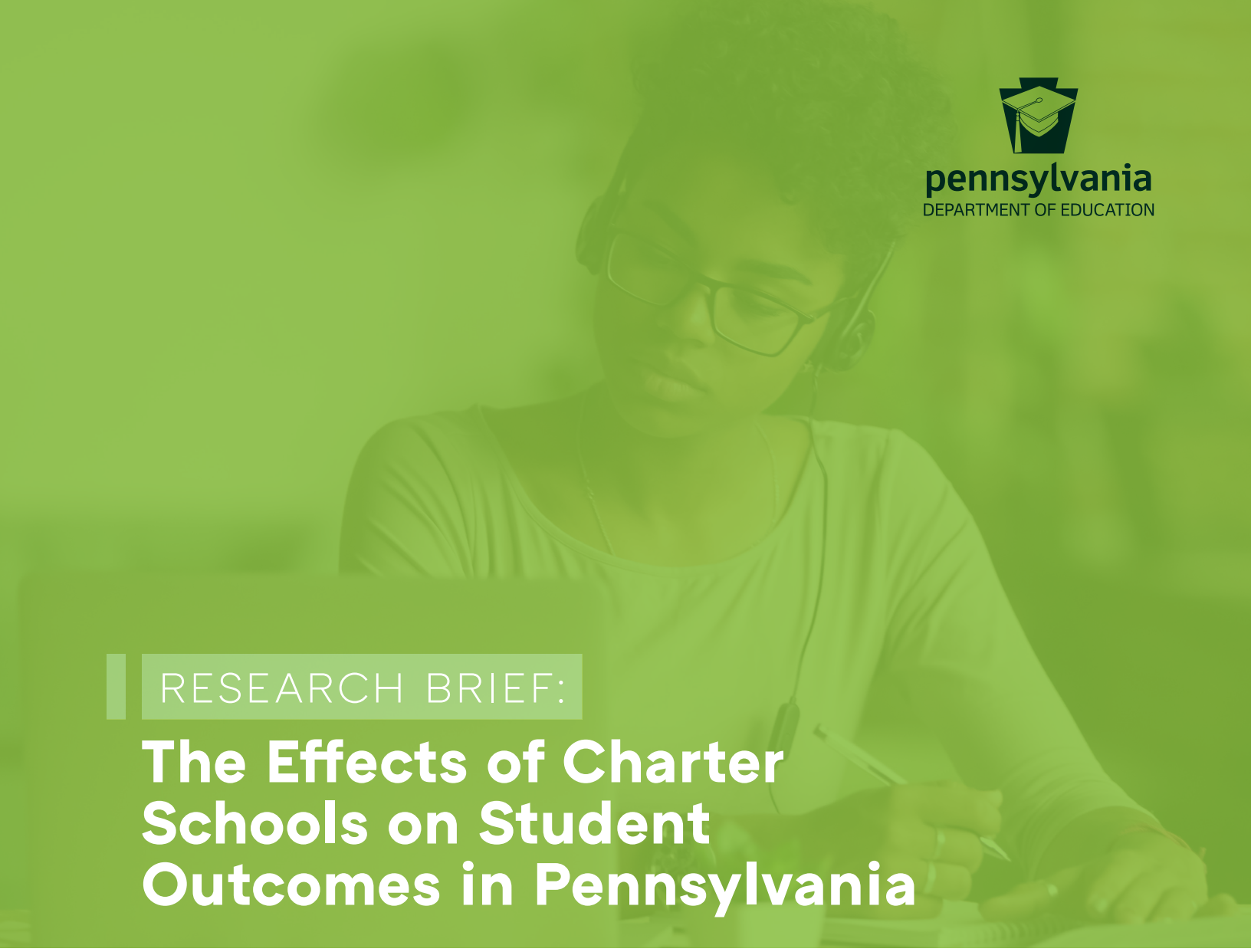

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RESEARCH BRIEF:

The Effects of Charter Schools on Student Outcomes in Pennsylvania

Report to the Pennsylvania Department of Education
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RECIPIENT OF THE
Education Research and Evaluation Scholar Award
from the Pennsylvania Department of Education (PDE)

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The Pennsylvania Department of Education (PDE) Evaluation and Research project is an effort that was established through a State Longitudinal Data System (SLDS) Grant from the Institute of Education Sciences (IES), National Center for Education Statistics (NCES), awarded in October 2015. The Research and Evaluation project is an initiative to make full use of the P-16+ system data and other data sources to answer priority questions from the PDE research agenda, to form collaborative research partnerships, and to increase PDE's capacity to conduct research. Our mission is to evaluate and analyze data to provide insight that can be used to positively impact policy, inform decision making and lead to improved student outcomes.

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Access the full report on "The Effects of Charter Schools on Student Outcomes in Pennsylvania" **and additional Research Project reports on PDE's website.** >

Executive Summary

Despite the continued growth of Pennsylvania's charter school sector, little is known about the impact of these schools on student achievement and attendance and even less is known about the effects on high-school and post-secondary outcomes. Therefore, the purpose of this report is to answer three key questions:

1. *What is the impact of Pennsylvania's charter schools on students' academic achievement, attendance, and post-secondary outcomes?*
2. *How does this vary based on characteristics of the charter school (i.e. Charter Management Organizations (CMOs) versus single school, online versus brick and mortar, suburban versus urban, number of years in operation, etc.)?*
3. *How does this vary for different groups of students (i.e. economically disadvantaged, students with disabilities, English learners, etc.)?*

The questions explored in this study align directly with and build upon the Pennsylvania Department of Education's (PDE) research agenda around charter schools and school choice.

Data for this study are drawn from PDE, the National Student Clearinghouse (NSC), EdNA, and the Common Core of data (CCD). PDE administrative data provide information on school attended, student characteristics, test scores, graduation, and post-secondary expectations, while NSC data provide information on post-secondary enrollment. This is supplemented with EdNA data, which are used to identify charter and cyber charter schools and CCD data, which are used to examine differential impacts by charter locale.

I focus on three primary samples: an elementary school sample, a middle school sample, and a high school sample. The elementary school sample consists of students who were in third grade in 2014 or 2015, were enrolled in Pennsylvania public schools in kindergarten, and who were zoned for a kindergarten school with at least one charter and traditional public school student of the same gender

and race. The middle school sample consists of students who were in sixth grade in 2013, 2014, or 2015, were enrolled in Pennsylvania public schools in fourth grade, and who were zoned for a fourth grade school with at least one charter and traditional public school student of the same gender and race. The high school sample consists of students who were in ninth grade in 2012 or 2013, were enrolled in Pennsylvania public schools in eighth grade, and who were zoned for an eighth grade school with at least one charter and traditional public school student of the same gender and race. Overall, students in these samples are more likely to be black, more likely to be eligible for free lunch, and are lower performing than other PA public school students.

To estimate the effect of charter schools on student performance, I combined matching with regression analysis. Specifically, I match charter school students to a group of traditional public school students using "cells" of baseline zoned school, gender, race, and cohort where baseline is defined as kindergarten for the elementary school analysis, grade 4 for the middle school analysis, and grade 8 for the high school analysis. I then use regression analysis to estimate the effect of charter school enrollment on student outcomes controlling for baseline characteristics, student test scores, and matched cell effects. Thus, comparisons are made between observationally equivalent charter and public school students who are of the same gender and race and were zoned to attend the same school at baseline. A similar approach has been shown to produce comparable estimates to those from lottery analyses, which exploit the random offer of charter school admission among applicants to mimic randomized control trials.

I find that overall, charter schools have negative or no impacts on test scores (**Table 1, Panel A**), but positive effects on other outcomes (**Tables 2 & 3, Panel A**). Charter school enrollment leads to small increases in attendance rates, reduces the probability of chronic absenteeism, and increases the probability of high school graduation. While charter schools do not have an impact on whether students enroll in post-secondary institutions, they affect the type and intensity of enrollment—shifting students from less than half-time to at least half time and from 2- to 4-year enrollment (**Table 3, Panel A**).

These averages mask considerable differences based on charter school characteristics, however. Most notably, cyber charter schools have a consistent negative effect across all outcomes except graduation, while brick and mortar charter schools have positive or no effects on student outcomes, including test scores and post-secondary enrollment (**Tables 1-3, Panel B**). There are also notable differences by locale, as urban charter schools have positive effects on test scores, attendance, graduation, and full-time post-secondary enrollment, while suburban and rural charters generally have negative or no effects (**Tables 1-3, Panel C**). Finally, CMOs seem to be somewhat more effective than independent charter schools (**Tables 1-3, Panel D**).

Black, Hispanic, and economically disadvantaged students appear to benefit most from charter school attendance, while charter schools have large negative effects on the test scores of white students. In terms of post-secondary enrollment, black, economically disadvantaged, general education and non-EL (English Learner) students appear to benefit more from charter schools than other groups.

Overall these findings are consistent with prior work finding mixed effects of charter schools on performance and positive effects on attainment.

Table 1: Effects of Charter Schools on student test scores, 2012-2017.

	Elementary School		Middle School		High School		
	Reading	Math	Reading	Math	Algebra I	Biology	Literature
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Pooled Results							
Years any charter	-0.012**	-0.046***	0.002	-0.017***	-0.020***	-0.014***	0.009*
	(0.005)	(0.005)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)
Panel B: By Charter Type							
Years brick & mortar	0.026***	-0.000	0.028***	0.015***	0.013***	0.018***	0.037***
	(0.005)	(0.005)	(0.003)	(0.002)	(0.004)	(0.005)	(0.005)
Years cyber charter	-0.212***	-0.275***	-0.099***	-0.142***	-0.087***	-0.079***	-0.049***
	(0.012)	(0.011)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)
Panel C: By Location							
Years urban	0.070***	0.044***	0.037***	0.029***	0.029***	0.039***	0.049***
	(0.006)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)	(0.006)
Years suburban	-0.056***	-0.091***	0.010*	-0.021***	-0.066***	-0.055***	-0.021
	(0.009)	(0.009)	(0.005)	(0.005)	(0.014)	(0.014)	(0.015)
Years rural	-0.091***	-0.108***	-0.044***	-0.071***	-0.072***	-0.067***	-0.013
	(0.025)	(0.025)	(0.012)	(0.012)	(0.016)	(0.014)	(0.018)
Years cyber	-0.231***	-0.292***	-0.102***	-0.146***	-0.090***	-0.090***	-0.054***
	(0.012)	(0.011)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)
Panel D: By CMO							
Years CMO	-0.078	-0.011	0.035	-0.001	-0.000	-0.015	0.022*
	(0.048)	(0.041)	(0.027)	(0.022)	(0.009)	(0.011)	(0.012)
Years Independent	-0.018***	-0.059***	-0.018***	-0.037***	-0.022***	-0.014***	0.007
	(0.006)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
Observations	203,540	203,966	378,967	378,910	66,043	65,308	65,603
R-squared	0.332	0.339	0.693	0.713	0.715	0.692	0.675

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Notes: Years any charter is the number of years in any type of charter at given level. All other charter school variables are defined analogously. Models also include controls for baseline free or reduced price lunch eligibility, special education status, English language learner status, gifted status, an indicator for whether student repeated baseline grade, total number of years enrolled in a charter prior to grade 3 for elementary school, grade 6 for middle school, and grade 9 for high school, and an indicator for enrolled in a charter at baseline. Models in columns 3-7 also include controls for third order polynomials of baseline reading and math scores and indicators for missing test scores at baseline. All models also control for baseline zoned school x cohort x race x gender fixed effects. Standard errors are clustered at the student level.

Table 2: Effects of Charter Schools on attendance, Academic Year 2014-2017.

	Elementary School		Middle School		High School	
	Attendance Rate	Chronically Absent	Attendance Rate	Chronically Absent	Attendance Rate	Chronically Absent
	(1)	(2)	(3)	(4)		
Panel A: Pooled Results						
Years any charter	0.356***	-0.013***	0.434***	-0.019***	0.175***	-0.007***
	(0.036)	(0.002)	(0.031)	(0.001)	(0.043)	(0.001)
Panel B: By Charter Type						
Years brick & mortar	0.347***	-0.021***	0.454***	-0.027***	0.315***	-0.010***
	(0.038)	(0.002)	(0.034)	(0.002)	(0.049)	(0.002)
Years cyber charter	0.385***	0.020***	0.357***	0.010***	-0.149**	0.001
	(0.067)	(0.003)	(0.059)	(0.002)	(0.073)	(0.002)
Panel C: By Location						
Years urban	0.561***	-0.032***	0.617***	-0.034***	0.634***	-0.022***
	(0.043)	(0.002)	(0.037)	(0.002)	(0.057)	(0.002)
Years suburban	-0.042	0.001	-0.102	-0.003	-0.141	0.000
	(0.059)	(0.003)	(0.063)	(0.003)	(0.129)	(0.005)
Years rural	-0.611***	0.023***	-0.649***	0.023***	-2.432***	0.105***
	(0.111)	(0.007)	(0.128)	(0.007)	(0.176)	(0.007)
Years cyber	0.318***	0.025***	0.479***	0.006**	-0.296***	0.006***
	(0.067)	(0.003)	(0.058)	(0.002)	(0.074)	(0.002)
Panel D: By CMO						
Years CMO	0.559***	-0.029***	-0.886**	0.024	0.437***	-0.016***
	(0.081)	(0.005)	(0.361)	(0.017)	(0.108)	(0.004)
Years Independent	-1.289***	0.066***	0.446***	-0.019***	0.132***	-0.005***
	(0.153)	(0.009)	(0.034)	(0.002)	(0.047)	(0.002)
Observations	212,452	212,458	396,602	396,614	546,802	546,852
R-squared	0.114	0.103	0.126	0.118	0.166	0.158

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Notes: Years any charter is the number of years in any type of charter at given level. All other charter school variables are defined analogously. Models also include controls for baseline free or reduced price lunch eligibility, special education status, English language learner status, gifted status, an indicator for whether student repeated baseline grade, total number of years enrolled in a charter prior to grade 3 for elementary school, grade 6 for middle school, and grade 9 for high school, and an indicator for enrolled in a charter at baseline. Models in columns 3-7 also include controls for third order polynomials of baseline reading and math scores and indicators for missing test scores at baseline. All models also control for baseline zoned school x cohort x race x gender fixed effects. Standard errors are clustered at the student level.

Table 3: Effects of Charter Schools on attainment and post-secondary expectations, High School, AY 2014-2016, students in Grades 9-12.

	Graduate	Diploma	GED	Expect 4 year PA	Expect 4 year, not PA	Expect 2 year PA	Expect 2 year not PA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Pooled Results							
Years any charter	0.073***	0.070***	0.000	0.017***	0.006***	0.004***	0.003***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)	(0.000)
Panel B: By Charter Type							
Years brick & mortar	0.081***	0.080***	-0.000	0.048***	0.009***	0.004***	0.002***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)	(0.000)
Years cyber charter	0.055***	0.047***	0.000	-0.061***	-0.002	0.004***	0.006***
	(0.002)	(0.002)	(0.000)	(0.003)	(0.002)	(0.001)	(0.001)
Panel C: By Location							
Years urban	0.077***	0.077***	0.000	0.061***	0.011***	0.006***	0.002***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)	(0.000)
Years suburban	0.062***	0.062***	0.000	-0.015**	-0.002	-0.001	-0.003***
	(0.003)	(0.003)	(0.000)	(0.006)	(0.004)	(0.002)	(0.001)
Years rural	0.065***	0.065***	-0.000	-0.028***	0.014**	-0.001	0.003
	(0.004)	(0.004)	(0.000)	(0.007)	(0.006)	(0.002)	(0.002)
Years cyber	0.047***	0.047***	0.000	-0.064***	-0.002	0.004***	0.006***
	(0.002)	(0.002)	(0.000)	(0.003)	(0.002)	(0.001)	(0.001)
Panel D: By CMO							
Years CMO	0.115***	0.112***	-0.000	0.063***	0.006***	0.003***	0.001*
	(0.002)	(0.002)	(0.000)	(0.004)	(0.002)	(0.001)	(0.001)
Years Independent	0.066***	0.063***	0.000	0.008***	0.006***	0.004***	0.003***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)	(0.001)
Observations	548,764	548,764	548,764	136,497	136,497	136,497	136,497
R-squared	0.019	0.050	0.010	0.208	0.143	0.055	0.104

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Notes: Years any charter is the number of years between grades 9 & 12 enrolled in any type of charter, years brick & mortar is the number of years between grades 9 & 12 enrolled in a brick & mortar charter, while years cyber charter is the number of years between grades 9 & 12 enrolled in a cyber charter. Models also include controls for 8th grade free or reduced price lunch eligibility, special education status, English language learner status, gifted status, an indicator for whether student repeated 8th grade, total number of years enrolled in a charter prior to grade 9, an indicator for whether 8th grade school is a charter, third order polynomials of 8th grade reading and math scores and indicators for missing 8th grade reading and math scores. All models also control for 8th grade zoned school x cohort x race x gender fixed effects. Standard errors are clustered at the student level.

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