



# FINAL WORKING DOCUMENT: LITERATURE REVIEW OF EIGHT REFORMS AND POLICY AREAS

Prepared for EdChoice

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## INTRODUCTION AND KEY FINDINGS

EdChoice has partnered with Hanover Research to explore the research surrounding the organization's eight major education reform areas of interest, including: class size; pre-kindergarten; public charter schools; common enrollment applications/unified enrollment systems; inter-/intra-district enrollment; school size; portfolio management; and school takeover. The objective of this review is to identify the impact of each of these school reforms on student outcomes. Accordingly, the review is restricted to randomized controlled trials (RCTs), considered the "gold standard" methodology for demonstrating causation and intervention impact.

The following report provides a summary of identified RCT studies, if available, across each of the eight reform areas, based on searches for relevant RCTs conducted in May 2019. Each section provides a high-level summary of findings from the body of research, as well as a summary of each study identified. Wherever possible, Hanover includes findings from the U.S. Department of Education's What Works Clearinghouse (WWC), which reviews individual education research studies for quality, impact, and implications.

### KEY FINDINGS

Among the eight reform areas of interest identified by EdChoice, Hanover identified one or more relevant RCTs in the following categories:

- **Class Size** – Hanover identified one RCT related to class size—the Tennessee STAR Project—although there have been several follow-up studies over multiple decades. This study found positive effects on standardized test performance for students who were assigned to a small class (defined as 13 to 17 students) in Grades K-3 compared to students assigned to regular class sizes (defined as 22 to 25 students) in the same grades, either with or without a teacher aide assigned to the classroom. The studies reviewed for this report find that the benefit of small class sizes in the early grades persist even after all students were returned to regular class sizes at Grade 4, through at least Grade 8, with larger benefits observed for minority students than white students, and for students who attended a small class across all four years (Grades K-3) than those who did not. At least four studies have continued to follow the Project STAR students into high school and adulthood, finding very small but significant differences in educational outcomes favoring small-class students, including likelihood to take a college entrance exam and likelihood of college enrollment at age 20.
- **Pre-Kindergarten** – This review finds seven RCTs related to Pre-Kindergarten or Head Start. The findings from these studies are somewhat inconsistent, likely due to the varying quality of programs. Programs like Perry Preschool or the Abecedarian Project offer significant support services to parents and children compared to typical, contemporary Pre-Kindergarten programs that are brought to scale. In general, small-scale studies generally find stronger, positive results of early childhood education (ECE) program participation than larger scale studies; evaluations of both Head Start (national sample) and Tennessee VPK that follow students through Grade 3 find that most, if not all, significant benefits of early childhood education participation fade by Grade 3. These findings from large-scale RCTs suggest that high-quality programming is difficult to scale while maintaining benefits for students.
- **Public Charter Schools** – Because regulations surrounding public charter schools require over-subscribed charters to conduct a random lottery for enrollment offers among all applicants, charter schools provide an interesting opportunity for quasi-experimental research that

leverages this random assignment to explore differential outcomes for students who win compared to students who do not. As such, charter schools are the subject of the greatest number of RCTs in this review, with 22 studies identified. In general, large-scale studies that examine charter schools as a complete sector find that the average charter school does not have a significantly different impact on student achievement outcomes than an average traditional public school. However, over the years, a number of highly-successful charter schools and networks have emerged that produce large, consistent gains in student achievement in math, and sometimes in reading. A small but growing body of lottery-based studies also find that charter school enrollment can have a positive impact on longer-term outcomes, such as college enrollment and quality of postsecondary institution. These benefits are particularly salient in urban centers, including New York, Boston, and Chicago, and among disadvantaged students. In recent years, researchers are beginning to focus on identifying the key elements of effective charter schools and exploring means for replication; these studies are explored in further detail in Section III.

- **Common Enrollment/Unified Enrollment Systems** – A review of the research surrounding common enrollment applications and unified enrollment systems did not identify any RCTs that compared such a system to a “business as usual” school choice approach. However, this review identified two recent RCTs that used informational and cue-to-action interventions to support students and parents in navigating the school choice process. A 2018 study of Grade 8 students in New York found that a simple informational intervention could improve the quality of high schools students to which students applied and were “matched,” while a 2019 study targeting parents of young children in New Orleans found that a text message-based informational intervention increased the likelihood that parents would apply and ultimately enroll their child in free, public early childhood education programs offered in the city.
- **Inter-/Intra-District Enrollment** – A review of the research surrounding inter-/intra-district enrollment did not identify any RCT studies that compared districts implementing such policies with districts that do not. Accordingly, this review expanded our search criteria to include studies that use inter- and intra-district enrollment policies to assess the impact of specific schools or programs. As of the time of this study, Hanover identified one RCT related to inter-/intra-district enrollment: a 2009 study of Connecticut’s inter-district magnet schools conducted by Bifulco, Cobb, and Bell. The study finds significant positive impacts on student achievement on standardized exams in math (0.14 standard deviations) and literacy (0.28 standard deviations) at Grade 8 after enrolling in the inter-district program in Grade 6 or later. However, it should be noted that WWC considers this study’s findings in mathematics to be “indeterminate.”
- **School Size** – Hanover identified three RCT studies related to school size; it should be noted that these studies are relatively small-scale and examine the impact of “small schools of choice”—meaning that the size of the school is likely not the only factor that makes treatment schools different from control schools in these studies. Further, all three studies take place in New York City and thus, may not be generalizable to a broader setting. Despite these limitations, the three studies find that students who attend a small school of choice are more likely to graduate high school on time (within 4 years), and tend to accumulate more credits at each grade level than their counterparts in other high schools.

Hanover did not identify any relevant RCTs for **Portfolio Management** or **School Takeover**. For both of these reform areas, the lack of RCTs is likely due to a combination of the logistical and legal/ethical challenges with randomizing education these types of educational reforms. Further, Portfolio Management is a relatively new and somewhat poorly-defined reform, and as such is an emerging area of interest for researchers.

## SUMMARY OF RCTS IN REFORM AREAS

REFORM AREA	NUMBER OF RCTS IDENTIFIED	NOTES
<b>Class Size</b>	1*	<ul style="list-style-type: none"> <li>Note that all identified studies originate from Project STAR, an initiative in Tennessee that used randomization to reduce class sizes for students in Grades K-3. Various follow-up studies examine longitudinal outcomes over multiple decades.</li> </ul>
<b>Pre-Kindergarten</b>	7**	<ul style="list-style-type: none"> <li>Note that among the studies identified, substantial positive effect sizes have been identified for small-scale implementations of comprehensive, high-quality programs, such as the Perry Preschool Project and the Abecedarian Project. Large-scale RCTs of early childhood education programs, including the Head Start Impact Study and the recent evaluation of Tennessee’s VPK program, tend to find mixed results.</li> </ul>
<b>Public Charter Schools</b>	22	<ul style="list-style-type: none"> <li>RCT studies of public charter schools often use the lottery-based application process as a mechanism for establishing study design.</li> <li>It should be noted that only 2 of the identified studies met WWC standards for evidence without reservations.</li> </ul>
<b>Common Enrollment Application/Unified Enrollment System</b>	2	<ul style="list-style-type: none"> <li>Note that the 2 RCTs identified focus on informational interventions to help families navigate common application/unified enrollment system processes.</li> </ul>
<b>Inter/Intra-District Enrollment</b>	1	<ul style="list-style-type: none"> <li>Hanover found RCTs related to inter/intra-district enrollment or open enrollment policies are largely limited to studies that use the presence of such systems to examine the impact of specific schools, programs, or school types. The 1 RCT identified for this category, for example, evaluates the impact of Connecticut’s inter-district magnet schools.</li> </ul>
<b>School Size</b>	3	<ul style="list-style-type: none"> <li>Hanover identified 3 studies related to school size that use randomization to assign students to treatment and control groups; it should be noted that both studies concern “small schools of choice” in New York City, and that 1 of the 3 studies meets standards of evidence set forth by WWC without reservation.</li> <li>Hanover also identified an additional RCT related to school size—a continuation of the previous study in New York—which is currently ongoing.</li> </ul>

REFORM AREA	NUMBER OF RCTs IDENTIFIED	NOTES
<b>Portfolio Management</b>	0	<ul style="list-style-type: none"> <li>▪ Hanover did not identify any RCTs related to the Portfolio Management Model.</li> </ul>
<b>School Takeover</b>	0	<ul style="list-style-type: none"> <li>▪ Hanover did not identify any RCTs related to school takeover.</li> </ul>

\*Note: This figure lists 1 RCT for class size, but there are a number of distinct follow-up studies from Project STAR, and thus a wide variety of outcomes resulting from a single study. \*\*Note: This figure lists 7 RCTs for pre-kindergarten that compare enrollment in a preschool program to no enrollment or to a “business as usual” condition. It should be noted that several of the studies have multiple associated follow-up studies over time, particularly the Perry Preschool Project and the Abecedarian Project.

# SECTION I: CLASS SIZE

## AVAILABLE RESEARCH – METHODS & LIMITATIONS

It should be noted that the Tennessee-based Student/Teacher Achievement Ratio Project (Project STAR)—which began in the mid-1980s—represents the most substantial source of evidence for the benefits of reduced class sizes. Project STAR used randomization to assign teachers and students to treatment and control conditions, and ultimately included about 7,000 students in Grades K-3.<sup>1</sup> To date, this is the only randomized controlled trial Hanover has identified related to class size in the United States. The figure below presents the original study and a selection of notable follow-up research, which has continued to follow the original students through at least 2011. Note that none of these studies appears to have been reviewed by WWC. **Note that an ERIC search reveals more than 100 studies related to the Project STAR datasets**, although not all related studies will be randomized controlled studies.<sup>2</sup>

## SUMMARY OF FINDINGS

The STAR project randomized more than 7,000 students in Grades K-3 and their teachers into three treatment categories: small classes (13-17 students), regular classes with a teacher's aide (22-25 students), and regular classes without a teacher's aide (i.e., the status quo of 22-25 students). The initial study, published in the early 1990s, found that Kindergarten students in small classes achieved significantly higher mean test scores across multiple measures of achievement, including math, sounds/letters, words/sentences, and total reading at follow-up than students in regular classes, both with and without a teacher aide. Alternately, some evidence in the study suggests a higher mean score on self-concept and motivation for students in regular-sized classes over those in small classes.

Follow-up studies conducted since 1990 have found a examined the original data and various follow-up data points in multiple ways, with many studies finding evidence for lasting effects of small class sizes in the early grades. In 2001, Nye, Hedges, Konstantopoulos found that students who were in a small class size for at least one year during Grades K-3 outperformed students in regular-sized classes across Grades K-3 on a standardized math exam in Grade 9 by 0.146 standard deviations. Further, students who were in small classes for *all* years throughout Grades K-3 outperformed students in regular class sizes on the same Grade 9 math exam by 0.340 standard deviations. Effect sizes were higher for minority students than for white students, suggesting that some subpopulations may benefit from reduced class sizes more than others. Similarly, Krueger and Whitmore's 2001 study found that while the performance benefits of small class size in Grades K-3 appeared to diminish over time after Grade 3, a persistent and positive effect could be observed on standardized exam scores through at least Grade 8. Furthermore, students assigned to small class sizes were slightly more likely to take a college entrance exam (SAT or ACT) in high school.

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<sup>1</sup> "Class size and student achievement." Center for Public Education. <http://www.centerforpubliceducation.org/research/class-size-and-student-achievement>

<sup>2</sup> Search Results for "Project STAR" ERIC. <https://eric.ed.gov/?q=Project+STAR&ff1=subClass+Size&pg=8>

Other studies examined long-term outcomes for the Project STAR students over time, including high school dropout rates (Pate-Pain et al., 1997) and college attendance, income at age 27, home ownership, and retirement savings (Chetty, et al, 2011). These studies find very small, but significant, differences in these broader adult outcomes in favor of students assigned to small classes in Grades K-3. For instance, Chetty et al finds that students in small classes were 1.8 percentage points more likely to be enrolled in college at age 20 compared to other students in the study.

**Figure 1.1: RCTs Related to Class Size and Selected Follow-up Studies**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Student/Teacher Achievement Ratio (STAR) Tennessee's K-3 Class Size Study. Final Summary Report 1985-1990"</u></a>	1990	Word, et al	7,000+ students	---	---
<p><b>Outcomes of Interest:</b> Academic achievement (Stanford Achievement Test, STAR Criterion Tests) and self-concept/motivation (SCAMIN)</p> <p><b>Summary of Findings:</b><sup>3</sup> This study sampled more than 7,000 students in Grades K-3 from 79 schools across the state of Tennessee located in rural, suburban, urban, and inner city locales. Specifically, the study examined students' achievement (i.e., based on normed and criterion test scores) and development (e.g., their self-concepts, attendance) under three different conditions at the sampled schools: 128 <i>small classes</i> (i.e., 13-17 students) teaching approximately 1,900 students (i.e., the <b>treatment group</b>); 101 <i>regular classes</i> (i.e., 22-25 students) teaching approximately 2,300 students (i.e., the <b>control group</b>), and 99 <i>regular classes with teacher aides</i> (i.e., 22-25 students) teaching approximately 2,200 students (i.e., a second <b>treatment group</b>). The study also administered the same tests used at the STAR project's sample schools—the Stanford Achievement Test (SAT), STAR Criterion Tests based on Tennessee's Basic Skills First Test (BSF), and the SCAMIN, a self-concept and motivation inventory—to an additional 1,100 students in <i>regular classes</i> at 22 schools with no students receiving any STAR study treatments to avoid any spillover effects.</p> <p>When measuring achievement across four measures—math, sounds/letters, words/sentences, and total reading—for Kindergarten students, the study found that mean scores for all four measures were highest for students in <i>small classes</i> (see p. 47 of linked file). When measuring student motivation and self-concept via the SCAMIN, the study found that means scores for self-concept was highest for students in <i>small classes</i>, though students in <i>regular classes</i> had the highest mean score for motivation (i.e., 0.01 points higher than for students in <i>small classes</i>) (see p. 48 of linked file). Mean scale scores and variability scores are provided for both assessments on pp. 47-48 of the linked file.</p> <p><b>Please note that Hanover could only locate a partial excerpt from the study</b>, limiting our ability to examine additional results. The full study seems like it is available in physical form through the Library of Congress.</p>					
<a href="#"><u>"STAR Follow-Up Studies, 1996-1997: The Student/Teacher Achievement Ratio (STAR) Project"</u></a>	1997	Pate-Pain, et al.	8,826 students	---	---
<p><b>Outcomes of Interest:</b> Academic achievement (math and reading; Grade 8, 9, &amp; 10 TCE scores, Grade 10 TCAP scores), dropout rates</p>					

<sup>3</sup> Data and summary drawn from: Word, E. et al. "The State of Tennessee's Student/Teacher Achievement Ratio (STAR) Project: Technical Report, 1985-1990." Tennessee Department of Education, Memphis State University, Tennessee State University, University of Tennessee-Knoxville, and Vanderbilt University. pp. 3-6, 10, 15-16, 47-48, 53-58. <https://www.classsizematters.org/wp-content/uploads/2016/09/STAR-Technical-Report-Part-I.pdf>



STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>4</sup> This study also examined data from the STAR Project described in the source above. In its background information, this study notes that the results of STAR "consistently and significantly [favor] small classes (<math>p \leq .01</math>)," with these findings extended across Grades K-3, sampled school locations, and various student attributes (e.g., ethnicity, gender).</p> <p>This particular study was designed to see if students from <i>small class</i> (i.e., 13-17 students) treatment group continued to see any performance differences from those in the <i>regular class</i> (i.e., 22-25 students) control and <i>regular class with teacher aide</i> (i.e., 22-25 students) comparison groups. The study also sought to see if class size had any effects on school dropouts for students that attended specific school types from the STAR study: rural, suburban, urban, and inner city. Specifically, the study used results from the Tennessee Competency Examination (TCE)—administered in Grades 8-10—however, the study authors note that a limited number of Grade 10 students from the initial STAR study appeared in the available TCE data. However, 8,826 students from the initial study did have TCE data: 2,809 small class students; 2,722 regular class students, and 3,295 regular class with teacher aide students. Notably, according to Grade 8 TCE results, a higher percentage of small class students passed the exam relative to students from regular or regular with teacher aide classes (see p. 10 of linked file). However, Grade 9 and 10 TCE data—which provided scores beyond a simple pass/fail designation as done for the Grade 8 scoring—showed that no student group averaged a passing score (i.e., 70+) and that no group had scores that "statistically favored" them over others. However, students from small classes did have higher mean TCE scores in math and language arts, with one exception: Grade 9 regular class students had a mean score in mathematics 0.4 points higher (see pp. 10-11 of linked file).</p> <p>Notably, an additional data point—mean academic scores of STAR students at Nashville Davidson County Schools for the 1994-95 school year—found that small class students had higher mean academic grades than those who had participated in regular or regular with teacher aide classes in foreign language, social studies, science, math, and English, with the final three subjects displaying statistically significant differences in scores (see p. 14 of linked file).</p> <p>Similarly, to determine dropout rates (and related measures such as retention rates) relative to student's assignment in the STAR study, the authors matched social security numbers from STAR students to Grade 8-10 test data to generate a list of students who did not appear. They then compared this list to data provided by school districts which coded students as withdrawn, retained in a grade, or dropped out between Grades K-10. In particular, this part of the study focused on three districts: Nashville-Davidson County, Pickett County, and Fentress County; however, given their demographics the study's authors could only examine effects within inner-city students (i.e., Nashville-Davidson County) and rural students (i.e., Pickett County and Fentress County). Findings indicate that rural small class students were less likely drop out, enter juvenile detention, or be expelled than peers from regular or regular with teacher aide classes. This finding was statistically significant when considering all three outcomes together, but when analyzed separately, the differences attached to individual outcomes were not statistically significant (see p. 20 of linked file). No similar data was provided in the study for Nashville-Davidson County.</p>					

<sup>4</sup> Data and summary drawn from: Pate-Bain, H. et al. "STAR Follow-Up Studies, 1996-1997: The Student/Teacher Achievement Ratio (STAR) Project." HEROS, Inc. and Educational Resources Information Center, U.S. Department of Education, September 1997. pp. 4, 6-8, 10-11, 13-15, 17-18, 20. <https://files.eric.ed.gov/fulltext/ED419593.pdf>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"The Long-Term Effects of Small Classes in Early Grades: Lasting Benefits in Mathematics Achievement at Grade 9"</u></a>	2001	Nye, Hedges, Konstantopoulos	~3,500 students	---	---
<p><b>Outcomes of Interest:</b> Math achievement</p> <p><b>Summary of Findings:</b><sup>5</sup> This study also examined data from the STAR Project. This particular study sought to determine whether assignment to a <i>small class</i> (i.e., 13-17 students) in Grades K-3 had any lasting effects on math achievement (as measured in Grade 9) and whether those effects—should they exist—differ across different school types: rural, suburban, urban, and inner city locales. The authors examined effects according to two classifications of small class treatments: students who were in a small class for at least one year of Grades K-3 and students who were in a small class for all four years of Grades K-3.</p> <p>For the first treatment (i.e., small class for at least one year), small classes had an overall treatment effect of .146 standard deviation units. Notably, the small-class effect was also .186 standard deviations for minority students and .002 for white students, indicating a statistically significant difference in treatment effects by race. Furthermore, Grade 9 average math test scores for students from small classes exceeded those from regular classes for the larger sample and by individual demographic groups: male, female, minority, white, low SES, and high SES (see pp. 251-252 of linked file).</p> <p>For the second treatment (i.e., small class for four years), small classes had an overall treatment effect of .340 standard deviation units, greater than that of the first treatment. Likewise, the small-class effect was .207 standard deviations higher for minority students than for white students, indicating a statistically significant difference in treatment effects by race and one a difference in treatment effects larger than that of the first treatment. Furthermore, Grade 9 average math test scores for students from small classes exceeded those from regular classes for the larger sample and by individual demographic groups: male, female, minority, white, low SES, and high SES (see pp. 253-254 of linked file).</p>					
<a href="#"><u>"The Effect of Attending a Small Class in the Early Grades on College-test Taking and Middle School Test Results: Evidence from Project STAR"</u></a>	2001	Krueger & Whitmore	9,397+	---	---
<p><b>Outcomes of Interest:</b> Academic achievement (state test scores); ACT or SAT exam participation and scores</p> <p><b>Summary of Findings:</b><sup>6</sup> This study also examined data from the STAR Project. Specifically, this study examines the impact of attending <i>small classes</i> and class size on standardized test scores in Grade K-8, on student propensity to take college-entrance exams (i.e., the SAT and ACT), and on students' SAT and ACT scores. Primarily, the study found that 43.7% of STAR students assigned to small classes took either the SAT or ACT, whereas 40% of students assigned to regular class did the same. This represents a statistically significant difference in test-taking rates. The study also found this disparity to be greater for black students than white students, with 40.2% of black students assigned to small classes taking the SAT or ACT and 31.7% of black</p>					

<sup>5</sup> Data and summary drawn from: Nye, B., L. Hedges, and S. Konstantopoulos. "The Long-Term Effects of Small Classes in Early Grades: Lasting Benefits in Mathematics Achievement at Grade 9." *Journal of Experimental Education*, 69:3, March 2001. pp. 245–246, 248–249, 250–254. [https://www.researchgate.net/publication/249038720\\_The\\_Long-Term\\_Effects\\_of\\_Small\\_Classes\\_in\\_Early\\_Grades\\_Lasting\\_Benefits\\_in\\_Mathematics\\_Achievement\\_at\\_Grade\\_9](https://www.researchgate.net/publication/249038720_The_Long-Term_Effects_of_Small_Classes_in_Early_Grades_Lasting_Benefits_in_Mathematics_Achievement_at_Grade_9)

<sup>6</sup> Data and summary drawn from: Krueger, A.B. and D.M. Whitmore. "The Effect of Attending a Small Class in the Early Grades on College-test Taking and Middle School Test Results: Evidence from Project Star." *The Economic Journal*, 111:468, January 1, 2001. pp. 1–4, 14–18, 21–22, 26. <https://academic.oup.com/ej/article-abstract/111/468/1/5139912?redirectedFrom=PDF>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>students assigned to regular classes doing the same. The black-white gap in taking the SAT or ACT was also 54% smaller in small classes vs. regular classes. <b>There are multiple effect sizes calculated regarding exam-take rates</b> (see pp. 16, 18 of linked file).</p> <p>Regarding scores on these exams, students from small classes taking either exam outperformed those from regular classes by approximately 0.1 standard deviations (with the difference being 0.2 standard deviations for black students). Notably the average ACT score for STAR students was lower than the Tennessee and U.S. average (see p. 4 of linked file). <b>There are effect sizes calculated regarding exam scores</b> (see pp. 21-22 of linked file). Overall, "attending a small class in the early grades raises performance on the ACT exam by about 0.13 standard deviation overall, and by 0.20 to 0.26 standard deviation for black students."</p>					
<p><b><u>"How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR"</u></b></p>	<p>2011</p>	<p>Chetty, et al</p>	<p>~11,000</p>	<p>---</p>	<p>---</p>
<p><b>Outcomes of Interest:</b> College attendance; home ownership; earnings at age 27; retirement savings</p> <p><b>Summary of Findings:</b><sup>7</sup> This study also examined data from the STAR Project. It finds correlations between Kindergarten test scores and earnings at age 27, college attendance, home ownership, and retirement savings. The study also finds that students from small classes are more likely to attend college and that students from "higher quality classrooms" (i.e., as measured by end-of-class test scores) have higher earnings and college attendance rates. Specifically, students assigned to small classes are "1.8 percentage points more likely to be enrolled in college at age 20." Relatedly, students from small classes earn approximately \$109 more per year on average by age 28 than those assigned to regular-sized classes.</p> <p>A plethora of data on "adult outcomes" (i.e., earnings, marriage rates, college attendance), along with means and standard deviations for that data, is available on pp. 50-72.</p>					

<sup>7</sup> Data and summary drawn from: Chetty, R. et al. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR." National Bureau of Economic Research, August 2011. pp. i, 1-2, 16, 50-72. <https://www.nber.org/papers/w16381.pdf>

## SECTION II: PRE-KINDERGARTEN

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

The research on the long-lasting positive effects of early childhood education programs tends to draw from a few, high-quality, small-scale, and rigorously evaluated studies, such as at the Abecedarian Project in North Carolina and the High/Scope Perry Preschool Project in Michigan. Some researchers, including Russ Whitehurst at Brookings, argue that the Abecedarian Project was unusually supportive of children and families and cannot be simply equated to services that are typically available to 3- and 4-year-old children as “pre-kindergarten” or “childcare” today.<sup>8</sup> Furthermore, there are very few randomized controlled trial studies of pre-kindergarten programs that have been implemented at scale—such as at the state, county, or district level. A 2017 systematic review of pre-kindergarten programs identified just one RCT study of a “scaled-up” pre-kindergarten program (see the studies of the Tennessee VPK in the table below).<sup>9</sup> An even more recent review published by Learning Policy Institute, which examined effect sizes across more than a dozen studies of pre-kindergarten programs, identified just two randomized controlled trials, each with one or more follow-up studies: the Head Start Impact Study and the Tennessee VPK Study.<sup>10</sup>

For this review, Hanover focused on identifying studies that randomly assigned young children to attend or not attend a selected pre-kindergarten, preschool, or other early childhood education program. It should be noted that several of the studies confirm that although children in the control group were not selected to enroll in the early childhood education program of interest for the study, many do enroll in some form of non-home-based care. Accordingly, WWC’s review of two of the studies listed below compare children’s enrollment in the program of interest, such as Head Start or the Abecedarian Project, with “business as usual,” which typically includes control group children who may or may not be enrolled in another form of pre-kindergarten or childcare. Thus, these are studies of the effectiveness of specific program models, rather than a pure study of the impact of pre-kindergarten compared to no early schooling.

### SUMMARY OF FINDINGS

A review of the research surrounding Pre-Kindergarten identified seven RCTs studies, although some distinct studies are follow-up research on earlier programs. Among these seven studies, three examine the impact of high-quality, very small-scale programs, generally including less than 200 students total. The remaining four studies examine larger-scale ECE programs. Across the body of research, small-scale studies generally find stronger, positive results of ECE program participation than larger scale studies; evaluations of both Head Start (national sample) and Tennessee VPK that follow students through Grade 3 find that most, if not all, significant benefits of early childhood education participation fade by Grade 3. These

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<sup>8</sup> Whitehurst, G.J. “Rigorous preschool research illuminates policy (and why the Heckman Equation may not compute.” Brookings Institution, 2017. <https://www.brookings.edu/research/rigorous-preschool-research-illuminates-policy-and-why-the-heckman-equation-may-not-compute/>

<sup>9</sup> DeAngelis, C.A., Erickson, H.H., and Ritter, G.W. “Is pre-kindergarten an educational panacea? A systematic review and meta-analysis of scaled-up pre-kindergarten in the United States.” University of Arkansas Department of Education Reform (EDRE) Working Paper Series, 2017. file:///C:/Users/eoakley/Downloads/SSRN-id2920635%20(1).pdf

<sup>10</sup> Meloy, B., Gardner, M., and Darling-Hammond, L. “Untangling the Evidence on Preschool Effectiveness.” Learning Policy Institute, January 2019. [https://learningpolicyinstitute.org/sites/default/files/product-files/Untangling\\_Evidence\\_Preschool\\_Effectiveness\\_REPORT.pdf](https://learningpolicyinstitute.org/sites/default/files/product-files/Untangling_Evidence_Preschool_Effectiveness_REPORT.pdf)

findings from large-scale RCTs suggest that high-quality programming is difficult to scale while maintaining benefits for students. Alternatively, as previously noted, the impacts of large-scale studies of Pre-K may be diluted if many children in the control group attend high-quality early childhood programs selected by their parents, which they are free to do in all studies noted in this report.

**Figure 2.1: RCTs Related to Pre-Kindergarten**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<i>Studies Reviewed by WWC</i>					
<a href="#"><u>"Head Start Impact Study: Final Report"</u></a>	2010	US Department of Health and Human Services	4,667	Meets WWC Standards w/o reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Academic achievement (Counting Bears Test, Woodcock-Johnson, Parent Emergent Literacy Scale, others); social-emotional development outcomes; health outcomes; parenting practices</p> <p><b>Summary of Findings:</b><sup>11</sup> This study seeks to determine the impacts of Head Start—a federal program which provides Pre-K, healthcare services, nutritional services, and parent education—on children's school readiness and parental practices that support children's development. The study also aims to determine under what conditions Head Start has the greatest impact and for which student populations its impacts are highest in magnitude. Specifically, the study examines about 5,000 three- and four-year-old students who were randomly assigned to either a treatment group with access to Head Start services or a control group that did not have access to Head Start, though these children were able to access alternative early childhood programming as determined by their parents. Notably, all findings in the treatment group relate to outcomes following one year of Head Start, as the study's authors cite feasibility and reasonability challenges in denying three-year-old students access to Head Start for an additional year.</p> <p>The study finds positive impacts from Head Start on school readiness (e.g., emergent literacy, vocabulary), though the study notes that many of these outcomes "yielded only a few statistically significant differences in outcomes at the end of 1<sup>st</sup> grade." WWC, which rates the study as meeting standards for quality of evidence without reservations, notes that there are statistically significant positive impacts observed for reading, as measured by the Parent Emergent Literacy Scale.</p> <p>Several effect sizes are given for these outcomes, as well as social-emotional learning and health outcomes (see pp. xxiv, xxvi, xxviii-xxxi of linked file), though effect sizes are only provided for statistically significant differences. Data on parenting impacts is also provided on pp. xxxiii-xxxiv. Effect sizes for more specific items are interspersed throughout the report:</p> <ul style="list-style-type: none"> <li>▪ Cognitive measures (e.g., language and literacy, math skills) (see pp. 4.10-4.13, 4.19, 4.21-4.25, 4.30)</li> <li>▪ Social-emotional development (see pp. 5.4-5.6, 5.8-5.11)</li> <li>▪ Health outcomes (see pp. 6.3-6.4, 6.6-6.7)</li> <li>▪ Parenting practices (see pp. 7.4-7.6, 7.8-7.10)</li> <li>▪ Above categories granulated by sub-groups (see pp. 8.23-8.62)</li> </ul>					

<sup>11</sup> Data and summary drawn from: [1] "Head Start Impact Final Report." Administration for Children and Families, U.S. Department of Health and Human Services, January 2010. pp. xiii-xvi, xviii, xxiv, xxvi, xxviii-xxxi, 4.10-4.13, 4.19, 4.21-4.25, 4.30, 5.4-5.6, 5.8-5.11, 6.3-6.4, 6.6-6.7, 7.4-7.6, 7.8-7.10, 8.23-8.62. <https://files.eric.ed.gov/fulltext/ED507845.pdf> [2] "Head Start Impact Study." What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/80434>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"The Life Cycle Benefits of an Influential Early Childhood Program"</u></a>	2016	Garcia, Heckman, Leaf, & Prados	137	Meets WWC Standards with reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Graduation (high school and 4-year college graduation); special education outcomes (ever had special education/total years received); progressing in school outcomes (years of education, ever retained/total years retained); access and enrollment outcomes (including enrollment in vocational/technical program or community college); labor market outcomes (employment status, income)</p> <p><b>Summary of Findings:</b><sup>12</sup> This study examines the Carolina Abecedarian Project (ABC) and the Carolina Approach to Responsive Education (CARE), which engage children aged eight weeks to five years, primarily disadvantaged black children. Specifically, the programs are designed to support children's "language, motor, and cognitive development [and] socio-emotional competencies considered crucial for school success including task-orientation, ability to communicate, independence, and pro-social behavior" via individualized treatments. Children in the treatment group participated in the ABC and CARE programs, while those in the control group attended alternative childcare or preschool.</p> <p>The study finds that ECE programs benefit health, labor incomes, crime, education, and mother's labor incomes. Notably, the authors state that ABC and CARE have substantial effects compared to "next best alternatives," such as increasing high school and college graduation rates, average years of schooling, and employment rates. Effects are also positive for listed health indicators (e.g., drug use, hypertension), as shown on pp. 23-24 of the linked document. Notably, females experience more beneficial treatment effects than males.</p> <p>WWC rates this study as meeting standards of evidence, but with reservations, citing high attrition within the study population, but confirming that "... the analytic intervention and comparison groups satisfy the baseline equivalence requirement." WWC also confirms three significant findings: students in the treatment group are significantly <i>less likely</i> to attend a community college or vocational school, significantly <i>more likely</i> to graduate from a four-year college or university, and, on average, attended more years of school overall than the control group. Other measures of labor market success and academic performance are considered to be "indeterminate."</p>					
<b>Additional Studies</b>					
<a href="#"><u>"Effects of the Tennessee Prekindergarten Program on Children's Achievement and Behavior through Third Grade"</u></a>	2018	Lispey, Farran, & Durkin	2,990	---	---
<p><b>Outcomes of Interest:</b> Academic achievement; special education placement; attendance and retention; teacher ratings of classroom behavior</p> <p><b>Summary of Findings:</b><sup>13</sup> This study examines the impacts of a Tennessee state voluntary PK (VPK) program, specifically related to 2,990 students who had applied to other oversubscribed programs who were randomly offered admission or added to a waiting list. The intent-to-treat group consists of 1,852 children and the control of 1,138. Notably, however, of the total sample</p>					

<sup>12</sup> Data and summary drawn from: [1] Garcia, J.L. et al. "The Life-Cycle Benefits of an Influential Early Childhood Program." National Bureau of Economic Research, December 2016. pp. iii, 1, 8-11, 13, 21-24, 65. <https://www.nber.org/papers/w22993.pdf> [2] "The Life-Cycle Benefits of an Influential Early Childhood Program." What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/84893>

<sup>13</sup> Data and summary drawn from: Lipsey, M.W., D.C. Farran, and K. Durkin. "Effects of the Tennessee Prekindergarten Program on Children's Achievement and Behavior through Third Grade." *Early Childhood Research Quarterly*, 45, 2018. pp. 155, 157-161, 163, 165-172.

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>of 2,990 children, 1,997 did attend PK for at least one day (i.e., treatment on treated group) and 993 did not (i.e., control group). Data was also collected for an intensive study sub-sample (ISS) of 1076 children. Ultimately, <b>1,608 children complied with the treatment (655 in the ISS) and 389 complied with the control constraints (125 in the ISS).</b></p> <p>The study finds that within the ISS sample, VPK effects are positive and statistically significant for Woodcock-Johnson achievement measures at the end of PK, though in later grades children in the control group observe performance measures that converge with the treatment group. By the end of Kindergarten, only Picture Vocabulary has a statistically significant difference, which disappears at the end of Grade 1. Likewise, most effect estimates are negative after Kindergarten, with control children outperforming VPK treatment participants. The same held true regarding teacher ratings of student preparedness for their grade-level. On the state achievement test measure, control children outperform (see pp. 166-172 of linked file) treatment children in all subjects, with statistical significance in math and science. In terms of behavior, there is no consistent direction of effect sizes and minimal statistical significance. Note that data is provided for both the ISS and RCT samples.</p>					
<a href="#">"A Randomized Control Trial of Statewide Voluntary Prekindergarten Program on Children's Skills and Behaviors through Third Grade: Research Report"</a>	2015	Lispey, Farran, & Hofer	1,076	---	---
<p><b>Outcomes of Interest:</b> Academic achievement in Grade 3 (emergent literacy, language, math); student behavior/non-cognitive outcomes (work-related skills, social behavior, readiness for grade-level work, liking for school, behavior problems, and peer relations)</p> <p><b>Summary of Findings:</b><sup>14</sup> This study also looks at the Tennessee Voluntary PK program. This study follows 3,000+ children who randomly were admitted or denied admission to the TN-VPK, though this particular report follows the intensive sub study sample (1,076 children) that were individually assessed and tracked in line with parental consent. The study sought to examine school readiness, (via the Woodcock Johnson and teacher ratings), .</p> <p>Notably, TN-VPK treatment had a statistically significant positive effect on achievement as measured by the Woodcock Johnson (see p. 26) and teacher ratings of preparedness (see p 28). Additionally, TN-VPK achievement effects were greater for ESL children and children of mothers with less than a high school education (see p. 30). In contrast, however, no statistically significant performance differences on the Woodcock-Johnson were measured at the end of Kindergarten or Grade 1. In Grades 2 and 3, control group children out-performed TN-VPK children (see p. 32). Teacher ratings for performance also reversed in later years (see p. 36).</p> <p>Conclusions are summarized on pp. 37-38.</p>					
<a href="#">"Third Grade Follow-Up to the Head Start Impact Study: Final Report"</a> <sup>15</sup>	2012	US Department of Health and Human Services	4,667	---	---

<https://reader.elsevier.com/reader/sd/pii/S0885200618300279?toKen=6ABC9A777A227F3BF6128E02DDE3A8459AB7C293A94B904FA36E5240DABB01A609E854FA8B7B68F8EC8B4CCE754D7118>

<sup>14</sup> Data and summary taken from: Lispey, M.W., D.C. Farran, and K.G. Hofer. "A Randomized Control Trial of a Statewide Voluntary Prekindergarten Program on Children's Skills and Behaviors through Third Grade." Peabody Research Institute, Vanderbilt University, September 2015. pp. 1, 15-17, 23-32, 36-38. <https://files.eric.ed.gov/fulltext/ED566664.pdf>

<sup>15</sup> Note: this is a follow-up study to the previously listed Head Start evaluation report, which was reviewed by WWC.

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Outcomes of Interest:</b> Academic achievement/cognitive impacts (multiple assessments); social-emotional impact (teacher-, parent-, and student-reported); health status and access to health services; parenting practices (parent-reported and teacher-reported)</p> <p><b>Summary of Findings:</b><sup>16</sup> This study builds on the original Head Start Impact Study (see US Department of Health and Human Services, 2010) and uses essentially the same sample. Overall, the study finds that Head Start improves preschool outcomes across developmental domains and the quality of preschools attended, though few impacts translate to academic achievement outcomes in Grades K-3, or on the quality of elementary school experiences. Likewise, though Head Start had a positive effect on students' language and literacy development in PK, the effects mostly dissipated in elementary school. Other areas that were impacted initially with dissipating effects include health. Most positive impacts were no longer found at the end of Grade 3. Some sub-groups experienced differential outcomes. Effect sizes for specific outcomes are located on pp. xxiii-xxiv, xxvii-xxviii, xxx, xxxii-xxxiii, 61-74, 77-78, 81-88, 90-91, 96, 98-100, 102-103, 110-115, 117-118, 122-125, 127-129, 131-132.</p>					
<p><a href="#">"The High/Scope Perry Preschool study: A Case Study in Random Assignment"</a><sup>†</sup></p>	2000	Schweinhart	123	---	---
<p><b>Outcomes of Interest:</b> Academic achievement (multiple measures); cognitive abilities (IQ tests); various health and behavior outcomes in adolescence; various health and behavior outcomes in adulthood; high school graduation rate; labor market participation and earnings</p> <p><b>Summary of Findings:</b><sup>17</sup> The Perry Preschool Project was a two-year early childhood education program established in Ypsilanti, Michigan in the 1960s that specifically targeted low-income Black children and their families. The study randomly assigned its participants to the early childhood education program or to a control condition; the treatment group attended the ECE program for two hours per day during the academic school year, and the child and their parents received significant additional support designed to improve parenting and support children's cognitive development. The original study, published in 1967, found evidence of early, positive benefits for cognitive development among treatment children.<sup>18</sup> Later studies, which followed students' progress over several decades with very little attrition, found dramatic benefits for participants into later childhood, adolescence, and adulthood. The article linked in this summary is a 2000 overview of outcomes available at that time, including increased likelihood of college graduation, decreased likelihood of being arrested, increased earnings in adulthood, and decreased use of social services.</p> <p>It must be noted that the High/Scope Perry Preschool study follows the initial participants through at least age 40. As such, there are many follow-up studies examining the long-term impact of this program. Additional information on the outcomes measured for participants over time can be found through <a href="#">High Scope's website</a>.</p>					

<sup>16</sup> Data and summary taken from: Puma, M. et al. "Third Grade Follow-Up to the Head Start Impact Study: Final Report." Administration for Children and Families, U.S. Department of Health and Human Services, October 2012. pp. xiv-xvii, xxiii-xxxiii, 61-74, 77-78, 81-88, 90-91, 96, 98-100, 102-103, 110-115, 117-118, 122-125, 127-129, 131-132. [https://www.acf.hhs.gov/sites/default/files/opre/head\\_start\\_report\\_0.pdf](https://www.acf.hhs.gov/sites/default/files/opre/head_start_report_0.pdf)

<sup>17</sup> Schweinhart, L. "The High/Scope Perry Preschool Study: A Case Study in Random Assignment." *Evaluation & Research in Education*, 14(3-4). 2000. <https://www.tandfonline.com/doi/abs/10.1080/09500790008666969>

<sup>18</sup> Weikart, DP. "Preschool Intervention – A Preliminary Report of the Perry Preschool Project." ERIC, 1967. <https://eric.ed.gov/?id=ED018251>



STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Early Childhood Education: Young Adult Outcomes from the Abecedarian Project"</u></a> <sup>†</sup>	2002	Campbell, Ramey, Pungello, Sparling, & Miller-Johnson	104	---	---
<p><b>Outcomes of Interest:</b> Academic achievement (multiple measures); cognitive abilities (IQ tests); various health and behavior outcomes in adolescence; various health and behavior outcomes in adulthood; high school graduation rate; labor market participation and earnings</p> <p><b>Summary of Findings:</b><sup>19</sup> The North Carolina Abecedarian Project is a high-quality ECE program that enrolled students during the 1970s. The program was specifically designed to improve cognitive and developmental outcomes for children from disadvantaged, low-income backgrounds. The program enrolled children beginning at infancy and provided a high-quality childcare environment through age 5 for eight hours per day, five days per week, year-round. The program also provided some support for parental engagement. Initial studies found benefits for treatment students as measured by IQ scores and academic achievement in elementary school. Later studies that followed the children into adulthood found substantial effects benefiting treatment children on intellectual and academic measures as young adults, as well as likelihood of college enrollment, total years of education obtained.</p> <p>Like the Perry Preschool Project, the Abecedarian Project continues to follow participants over time, and many follow-up studies have examined the long-term impact of the program. Additional information on studies surrounding the Abecedarian Project can be found at the <a href="#"><u>North Carolina Abecedarian Project website</u></a>.</p>					

†Note: There are multiple studies over time of both the High/Scope Perry Preschool Project and the Abecedarian Project.

<sup>19</sup> Campbell, Ramey, Pungello, Sparling, and Miller-Johnson. "Early Childhood Education: Young Adult Outcomes from the Abecedarian Project." *Applied Developmental Science*, 2002. [https://www.tandfonline.com/doi/abs/10.1207/S1532480XADS0601\\_05?src=recsys](https://www.tandfonline.com/doi/abs/10.1207/S1532480XADS0601_05?src=recsys)

## SECTION III: PUBLIC CHARTER SCHOOLS

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

Over the last several decades, multiple methodological approaches have been used to try to capture the impact of public charter schools on student outcomes. In general, the randomized controlled trial remains the “gold standard” methodology and is a good fit for evaluating charter schools in some cases, such as when the demand for enrollment at an individual charter school exceeds the number of seats available and the school uses a random lottery to award seats to the applicant pool. However, because this methodology can only be employed when individual schools experience over-enrollment, such studies may only represent the most popular and in-demand schools, calling into question whether results are generalizable across the charter school sector.<sup>20</sup>

As shown in the figure on the following page, this review identified 22 studies<sup>21</sup> that leverage randomization to evaluate the impact of charter enrollment, including six studies—or components of studies—reviewed by WWC. Note that one additional, national-level study, conducted by Ferguson et al in 2012, is sometimes referred to as a lottery-based study; however, the study uses randomized experimental methods as a mechanism to validate the study’s larger propensity-score matching methodology.<sup>22</sup> Accordingly, we do not include the study in our table below.

### SUMMARY OF FINDINGS

As shown in Figure 3.1 on the following page, while lottery-based studies of charter schools to date share common methodological elements, these studies vary widely in their scope, purpose, and key research questions. Small-scale studies of a single school or network aim to examine the effectiveness of that single program, while larger city, state, or national studies aim to examine the impact of charter schools as a complete educational reform/phenomenon. Several small-scale studies of high-profile charter schools or charter networks, such as the KIPP Network or Promise Academy in the Harlem Children’s Zone, have demonstrated consistent, significant, and strong effects of charter enrollment on student test scores in reading and math. However, several large, national and/or state studies of charter school enrollment as a whole find more lackluster results; in a national sample of 36 charter middle schools, Gleason et al found no significant differences in student achievement between lottery-winners and lottery-losers (2010). A 2016 analysis of lottery-based charter school studies spanning more than 100 schools conducted by Cohodes et al found significant but very small benefits for students who won charter school lotteries, generally less than a third of the impact on test scores observed for some of the highest-performing individual charter schools.

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<sup>20</sup> See, for example: Rainey, L. “Making Sense of Charter School Studies: A Reporter’s Guide.” Center for Reinventing Public Education, 2015. [https://www.crpe.org/sites/default/files/mediaguide-charterschoolstudies-apr2015\\_0.pdf](https://www.crpe.org/sites/default/files/mediaguide-charterschoolstudies-apr2015_0.pdf)

<sup>21</sup> Note that one study (Tuttle et al, 2015) is listed in the figure twice. This is due to WWC’s separate analysis of two distinct components of the study for different subpopulations. Note that WWC rates evidence from the study for elementary school students as “does not meet standards,” while evidence from the study for middle school students is rated as meeting standards without reservations. This is primarily due to differences in methodology.

<sup>22</sup> Ferguson et al., “The National Study of Charter Management Organization Effectiveness: Charter School Management Organizations: Diverse Strategies and Diverse Student Impacts.” Mathematica Policy Research, 2012. [https://www.crpe.org/sites/default/files/pub\\_cmofinal\\_Jan12\\_0.pdf](https://www.crpe.org/sites/default/files/pub_cmofinal_Jan12_0.pdf)

The narrative that emerges from these findings was perhaps best summarized by Dobbie and Fryer in their 2013 study of Promise Academy in New York City:

The typical charter school is no more effective at increasing test scores than the typical traditional public school (Gleason et al. 2010). Yet, an emerging body of research using admissions lotteries suggests that high-performing charter schools can significantly increase the achievement of poor urban students.<sup>23</sup>

In recent years, lottery-based studies of charter schools have increasingly focused on not only exploring whether or not charter schools improve student achievement, but *which* charter schools improve student achievement, as well as the common elements of successful charters. Multiple studies find evidence for the benefits of the “No Excuses” charter school model in urban settings like Boston and Chicago (see, for example, Abdulkadiroğlu, et al, 2011, Davis and Heller, 2017, and Angrist, Pathak, and Walters, 2013). However, some research suggests that test score improvements associated with “No Excuses” charter schools can be explained by other factors related to school setting (Chabrier, Cohodes, & Oreopoulos, 2016). For example, Dobbie and Fryer’s 2013 study of charter schools in New York City identify several key elements associated with the highest-performing charters in the city, including setting high expectations, using data-based instruction, providing frequent teacher feedback, offering high-dosage tutoring, and securing increased instructional time. Emerging research from Boston Public Schools finds that the highest-performing charter schools in the city have successfully expanded their programs, while maintaining quality and achieving comparable gains in student achievement in their new campuses and locations, when given the opportunity to do so (Cohodes, Setren, & Walters, 2019).

When examining the results of individual studies, the context of each study and school must be carefully considered. Overwhelmingly, these studies examine charter schools in large urban centers, including Boston (3 studies), New York City (8 studies), Chicago (2 studies), and Washington, DC (1 study). At least one study of urban and non-urban charter schools found that non-urban charters were less likely to improve student outcomes (Angrist, Pathak, & Walters, 2013). Thus, the external validity of these studies may be questionable.

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<sup>23</sup> Dobbie and Fryer. “Medium-term impacts of high-achieving charter schools on non-test score outcomes.” National Bureau of Economic Research, 2013. <https://www.nber.org/papers/w19581>

**Figure 3.1: RCTs Related to Public Charter Schools**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<i>Studies Reviewed by WWC</i>					
<a href="#"><u>"Are high-quality schools enough to close the achievement gap? Evidence from a social experiment in Harlem (NBER Working Paper 15473)"</u></a>	2009	Dobbie & Fryer	467 students	Additional source not reviewed	--
<p><b>Outcomes of Interest:</b> Academic achievement (math and ELA test scores); attendance; grade completion</p> <p><b>Summary of Findings:</b><sup>24</sup> This 2009 study examines the impact of the Harlem Children’s Zone, defined as “... a 97-block area in central Harlem, New York, that combines reform-minded charter schools with a web of community services designed to ensure the social environment outside of school is positive and supportive for children from birth to college graduation.” Specifically, the study examines Promise Academy, a “No Excuses” charter school located in the Harlem Children’s Zone. In this study, researchers examined elementary and middle school applicants to Promise Academy between 2003 and 2009. At the middle school level, researchers leveraged the random lottery enrollment process to identify relevant “treatment” and “control” groups who were or were not offered seats at Promise Academy at the time of the lottery. This summary focuses on lottery-based results for middle school students, as true lottery-based results could not be estimated at the elementary level due to a lack of sufficient applicants.</p> <p>Results suggest significant, positive benefits on math achievement tests for lottery-winners compared to lottery-losers, beginning in the first year of middle school, and continuing to improve through Grade 8. Results on reading standardized exams were not statistically significantly different between the two groups of interest. Note that while WWC lists this study as an additional source that was not reviewed during the expert panel’s search for evidence surrounding Harlem Children Zone’s Promise Academy Charter Schools. As of January 2018, WWC reported: “... no studies of Harlem Children’s Zone (HCZ) Promise Academy Charter Schools were found that fell within the scope of the Charter Schools review protocol and met WWC evidence standards.”<sup>25</sup></p>					
<a href="#"><u>"The evaluation of charter school impacts: Final report (NCEE 2010-4029)"</u></a>	2010	Gleason, et al	36 schools; 2,150 students	Meets WWC standards w/o reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Academic achievement (math and ELA test scores); grade promotion; absenteeism; lateness/tardies; behavioral outcomes; parental involvement; parent and student satisfaction with school; additional self-reported measures (emotional/internal behavioral outcomes and knowledge, attitudes, and values outcomes)</p> <p><b>Summary of Findings:</b><sup>26</sup> This large, national study on the impact of charter schools explores the impact of enrollment at 36 charter middle schools across 15 states. The study relies on a lottery-based analysis, meaning that all 36 charter schools selected needed to experience sufficient over-subscription to create a substantial pool of “lottery-winners” and “lottery-losers” for comparison. The study follows both groups of students over a two-year period. In addition to common academic outcomes (measured on state standardized exams), the study also examined</p>					

<sup>24</sup> [1] Dobbie and Fryer. “Are high-quality schools enough to close the achievement gap? Evidence from a social experiment in Harlem.” National Bureau of Economic Research, 2009. <https://www.nber.org/papers/w15473> [2] “Are high-quality schools enough to close the achievement gap? Evidence from a social experiment in Harlem.” What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/67283>

<sup>25</sup> See: “Harlem Children’s Zone (HCZ) Promise Academy Charter Schools.” What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Intervention/1289>

<sup>26</sup> [1] Gleason, P, Clark, M, Tuttle, CC, and Dwoyer, E. “The evaluation of charter school impacts: Final report (NCEE 2010-4029).” National Center for Education Evaluation and Regional Assistance, 2010. <https://eric.ed.gov/?id=ED510573> [2] “The evaluation of charter school impacts: Final report (NCEE 2010-4029).” What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/67302>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>a number of other, less common outcomes, including student behavior, attendance, satisfaction with their school, and other self-reported measures related to attitudes and perceptions collected via survey.</p> <p>After following the middle school applicants over a two-year period, the study finds that “on average, charter middle schools that held lotteries were neither more nor less successful than traditional public schools in improving math or reading test scores, attendance, grade promotion, or student conduct within or outside of school.” The study does find significant positive effects for lottery-winners and their parents on measures of satisfaction with their school.</p> <p>Notably, WWC rates this 2010 study as meeting standards for quality of evidence without recommendations. The WWC review confirms the lack of statistically significant findings for student achievement on math and reading exams, but reviews significant findings for other, minor outcomes of interest, such as student-reported measures of emotional/internal behavior and student attendance/lateness. The full overview of results can be explored <a href="#">here</a>.</p>					
<a href="#">“KIPP middle schools: Impacts on achievement and other outcomes, final report”</a>	2013	Tuttle, et al	13 schools; 590 students	Additional source not reviewed	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); student surveys</p> <p><b>Summary of Findings:</b><sup>27</sup> This evaluation report, produced by Mathematica Policy Research on behalf of the Knowledge is Power Program (KIPP) charter school network, examines outcomes for middle school students enrolled in 43 KIPP charter schools located in cities in the United States. The study employs a lottery-based method on a subset of 13 charter middle schools that experienced a larger number of applicants than available seats in 2008 and 2009. The lottery-based analysis leverages this over-subscription to compare results for lottery-winners and lottery-losers, who are, in theory, statistically similar except for the opportunity to enroll in a KIPP charter school.</p> <p>The lottery-based study results find statistically significant, positive gains in math achievement for lottery-winners compared to lottery-losers. However, gains in achievement were not observed in the lottery sample for standardized reading exams. Additional results drawn from student surveys find that KIPP lottery winners report spending more time on homework each night and are more likely to report getting in trouble at school compared to lottery-losers. However, the study finds no significant differences between lottery-winners and lottery-losers in terms of students’ educational aspirations or various self-reported measures of engagement. The study also estimates results for a larger subset of outcomes (including achievement in various core subject areas) for a wider group of schools using a matching method; because this does not constitute an RCT, this summary does not detail these results.</p> <p>It must be noted that the authors confirm that, while the lottery-based results are methodologically rigorous, findings from this methodology may not represent the entirety of the KIPP charter network, as many schools could not be included in the lottery analysis due to insufficient over-subscription. Accordingly, these results should be considered with caution. WWC lists the study on its website but does not rate the quality of evidence at this time.</p>					

<sup>27</sup> [1] Tuttle Gill, Gleason, Knechtel, Nichols-Barrer, and Resch. “KIPP middle schools: Impacts on achievement and other outcomes, final report.” Mathematica Policy Research, 2013. <https://eric.ed.gov/?id=ED540912> [2] “KIPP middle schools: Impacts on achievement and other outcomes, final report.” What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/77028>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#">"Stand and deliver: Effects of Boston's charter high schools on college preparation, entry, and choice."</a>	2014	Angrist, et al	6 schools; 3,920 students	Meets WWC standards w/o reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math test scores – Grade 10); on-time graduation (4 or 5 years); SAT exam participation; SAT composite score; AP exam participation; AP score of 3 or higher</p> <p><b>Summary of Findings:</b><sup>28</sup> The study examines applicants to six charter high schools between 2002 and 2009, examining any differences in academic achievement and postsecondary outcomes for lottery-winners compared to lottery-losers. The study leverages the random lottery process for over-subscribed charter schools to estimate charter impact. Authors focus not only on measures of student achievement while in high school, but longer-term outcomes related to post-secondary education, including participation and scores on college entrance exams and AP tests as well as on-time high school graduation.</p> <p>Overall, the study finds statistically significant positive effects for lottery winners on most outcomes of interest, including likelihood to participate in SAT and AP exams, scores on SAT and AP exams, and state exam scores in reading and math. It should be noted that the WWC rates this study as meeting standards for quality evidence without reservations, confirming positive outcomes for lottery winners in each of the outcomes of interest, with one notable exception. WWC clarifies that the study finds that charter lottery winners are actually <i>less</i> likely to graduate within four years than lottery-losers (a graduation rate of 54 percent compared to 69 percent in the control group). However, there are no statistically significant differences in 5-year graduation rates between the treatment and control groups.</p>					
<a href="#">"Understanding the effect of KIPP as it scales: Volume I, Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation [Elementary School]"</a>	2015	Tuttle, et al	8 schools; 1,097 students	Does not meet WWC standards	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math Woodcock-Johnson III assessment); parent surveys</p> <p><b>Summary of Findings:</b><sup>29</sup> This evaluation report, completed by Mathematica Policy Research on behalf of the Knowledge is Power Program (KIPP), uses a lottery-based methodology to explore achievement outcomes in reading and math for students who apply to attend one of KIPP's 8 elementary, 43 middle, and 18 high schools with sufficient lottery information in 20 cities across the United States. The study uses a lottery-based method for elementary and middle schools that are sufficiently over-subscribed to support a relevant lottery analysis; the study using a matched-student methodology at the high school level and for other schools with insufficient lottery data. The summary presents separate analyses for each school level; this report summary focuses on the analysis of lottery-winners and lottery-losers at the elementary level.</p>					

<sup>28</sup> [1] Angrist, Cohodes, S. R., Dynarski, S. M., Pathak, P. A., & Walters. "Stand and deliver: Effects of Boston's charter high schools on college preparation, entry, and choice." Society for Research on Educational Effectiveness, 2014. <https://eric.ed.gov/?id=ED562936> [2] "Stand and deliver: Effects of Boston's charter high schools on college preparation, entry, and choice." What Works Clearinghouse | Institutes for Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/77769>

<sup>29</sup> [1] Tuttle et al. "Understanding the effect of KIPP as it scales: Volume I, Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation." Mathematica Policy Research, 2015. <https://eric.ed.gov/?id=ED560079> [2] "Understanding the effect of KIPP as it scales: Volume I, Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation [Elementary school]." What Works Clearinghouse | Institutes for Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/85517>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>In a comparison of lottery-winners compared to lottery-losers (in this case, an Intent to Treat (ITT) estimate), the report finds significant, positive effects for lottery-winners after three years of enrollment at KIPP on three measures of cognitive abilities on the Woodcock-Johnson III assessment: calculation (math), letter-word identification (reading), and passage comprehension (reading). <b>Note that WWC rates this component of the study as not meeting standards of evidence due to high attrition</b>, causing the experimental and control groups to not meet minimum expectations for equivalency.</p>					
<p><a href="#">"Understanding the effect of KIPP as it scales: Volume I. Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation [Middle School: RCT]"</a></p>	2015	Tuttle, et al	16 schools; 607 students	Meets WWC standards w/o reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); student surveys; parent surveys</p> <p><b>Summary of Findings:</b><sup>30</sup> This evaluation report, completed by Mathematica Policy Research on behalf of the Knowledge is Power Program (KIPP), uses a lottery-based methodology to explore achievement outcomes in reading and math for students who apply to attend one of KIPP's 8 elementary, 43 middle, and 18 high schools with sufficient lottery information in 20 cities across the United States. The study uses a lottery-based method for elementary and middle schools that are sufficiently over-subscribed to support a relevant lottery analysis; the study using a matched-student methodology at the high school level and for other schools with insufficient lottery data. The summary presents separate analyses for each school level; this report summary focuses on the analysis of lottery-winners and lottery-losers at the middle school level.</p> <p>At the middle school level, a comparison of lottery-winners to lottery-losers (also an Intent-to-Treat estimate) finds significant, positive benefits for mathematics achievement after just one year enrollment and ultimately ranging between 0.10 and 0.24 standard deviations. Significant benefits for reading achievement at the middle school level begin to appear after two years of enrollment and range between 0.14 and 0.18 standard deviations. Note that while WWC does not accept the elementary school components of the study, the middle school analysis is rated as meeting standards without reservations. WWC confirms that there is at least one statistically significant positive finding in the study, identifying significant benefits of KIPP in both reading and math exam scores.</p>					
<b>Additional Studies</b>					
<p><a href="#">"The impact of charter schools on student achievement"</a></p>	2004	Hoxby & Rockoff	3 schools	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p>					

<sup>30</sup> [1] Tuttle et al. "Understanding the effect of KIPP as it scales: Volume I, Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation." Mathematica Policy Research, 2015. <https://eric.ed.gov/?id=ED560079> [2] "Understanding the effect of KIPP as it scales: Volume I, Impacts on achievement and other outcomes. Final report of KIPP's Investing in Innovation grant evaluation [Middle school RCT]." What Works Clearinghouse | Institutes for Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/85538>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>31</sup> This study uses a lottery-based methodology to examine the impact of three charter schools in Chicago. The three schools, Longwood (Grades K-12), Bucktown (Grades K-8), and Prairie (Grades K-8), are chartered by the Chicago Charter Schools Foundation and are part of a charter system known as the Chicago International Charter School (CICS). The study examines academic outcomes for students who were “lotteried-in” and “lotteried-out” in 2000, 2001, and 2002.</p> <p>The study finds mixed results for the impact of charter schools based on various statistical methods. Ultimately, the authors conclude that lotteried-in students who enrolled in one of the CICS schools in the early elementary grades (Grades K-3) experienced significant, positive results on reading and math standardized tests compared to lotteried-out students. However, lotteried-in students who received a seat in Grade 4 or later did not experience significant benefits compared to students lotteried-out at the same grade level. The study concludes that early enrollment in a high-quality charter school may have lasting benefits for students, but that enrollment of older students at later grade levels does not appear to have the same benefits.</p>					
<p><a href="#"><u>“Charter schools in New York City: Who enrolls and how they affect their students’ achievement”</u></a></p>	2009	Hoxby & Murarka	42 schools	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>32</sup> In this study, Hoxby and Murarka use charter school lottery data to examine the demographic characteristics of students who apply to, lottery in to, and ultimately enroll in over-subscribed charter schools in New York City. The study goes on to explore the impact of charter school enrollment on standardized exam scores in math and reading, leveraging the random lottery assignment mechanism to compare outcomes for lotteried-in and lotteried-out students of the 42 over-subscribed charter schools in 2005-2006 for which data is available and lotteries appear to produce balanced “treatment” and “control” groups based on observed characteristics. This sample of 42 charter schools represents nearly all of the 47 charter schools operating in New York City during academic year 2005-2006.</p> <p>The authors conclude that, on average, lotteried-in students in Grades 3 through 8 who enroll in an over-subscribed charter school in New York City observe statistically significant boost in math scores (0.09 standard deviations per year of attendance) and reading scores (0.04 standard deviations) compared to lotteried-out students who enroll in other schools in the City.</p>					
<p><a href="#"><u>“Inputs and Impacts in Charter Schools: KIPP Lynn”</u></a></p>	2010	Angrist, Dynarski, Kane, Pathak, & Walters	1 school; 457 students	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>33</sup> This study examines one specific location of the largest charter school network in the United States: the Knowledge is Power Program (KIPP). Located in Lynn, Massachusetts, KIPP Lynn enrolls students in Grades 5 through 8, generally offering about 300 seats for placement through a randomized lottery. This study leverages the lottery system to</p>					

<sup>31</sup> Hoxby and Rockoff. “The Impact of Charter Schools on Student Achievement.” Unpublished paper – Harvard University, 2004.  
<https://www0.gsb.columbia.edu/faculty/jrockoff/hoxbyrockoffcharters.pdf>

<sup>32</sup> Hoxby, CM and Murarka, S. “Charter Schools in New York City: Who Enrolls and How They Affect Their Students’ Achievement.” National Bureau of Economic Research, 2009.  
<https://www.nber.org/papers/w14852>

<sup>33</sup> Angrist, Dynarski, Kane, Pathak, and Walters. “Inputs and Impacts in Charter Schools: KIPP Lynn.” *American Economic Review*, 2010.  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.491.689&rep=rep1&type=pdf>



STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
compare students who win the enrollment lottery and enroll in KIPP Lynn and to those who don't win the enrollment lottery, following four cohorts of first-time, Grade 5 applicants over the years 2005 through 2008.					
<p>Several significant findings emerge from the paper, including that lottery-winners are about as likely as lottery-losers to change schools during Grades 6 through 8, providing some evidence against the idea that KIPP schools either intentionally or unintentionally encourage low-performers or "weaker" students to leave the school. Additionally, the study finds a significant positive boost in test scores on math (0.35 standard deviations) and reading (0.12 standard deviations). Effects were similar for Hispanic and non-Hispanic students, and students with initially lower test scores (baseline Grade 4) experienced larger benefits than those with initially higher test scores. Notably, the authors point out that compared to many charter schools in urban centers in the United States, KIPP Lynn enrolls an "unusually high proportion" of English language learners and special education students, making the school an interesting case to explore the potential impact of charter school enrollment in these subpopulations.</p>					
<a href="#"><u>"Accountability and flexibility in public schools: Evidence from Boston's charters and pilots"</u></a>	2011	Abdulkadiroğlu, Angrist, Dynarski, Kane, & Pathak	~9,000 students	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>34</sup> Using student data collected in Boston Public Schools between the years 2001 and 2009, this study examines the overall impacts of all charter schools and pilot schools (local, union-supported alternatives to charter schools) in Boston. This entry describes only the results from students who applied to charter schools, excluding pilot school results. The analysis included cohorts of students who applied for one or more of five over-subscribed charter middle schools or three charter high schools. Notably, the authors confirm that most over-subscribed charter schools in the Boston area align with a "No Excuses" educational model, suggesting that these results may be more reflective of the impact of this type of charter school.</p> <p>Results of the lottery-based analysis of charter schools found positive effects for charter lottery winners at both the middle and high school levels. Middle school students who won a charter seat scored, on average, between 0.20 and 0.25 standard deviations higher in ELA and between 0.36 and 0.42 standard deviations higher in math per year enrolled in a charter school compared to those who did not win the charter lottery. At the high school level, winning the charter school lottery and enrolling is associated with a significant increase in math scores, on average, between 0.35 and 0.37 standard deviations per year of enrollment in a charter. In ELA, effects at the high school level are significant only after controlling for multiple demographic factors and past performance, ranging from approximately 0.18 to 0.27 standard deviations per year of enrollment in a charter. Note that this analysis did not examine charter school students at the elementary level.</p>					
<a href="#"><u>"Are high-quality schools enough to increase achievement among the poor? Evidence from the Harlem Children's Zone"</u></a>	2011	Dobbie & Fryer	842 students	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); grade completion; attendance/absences</p>					

<sup>34</sup> Abdulkadiroğlu, Angrist, Dynarski, Kane, & Pathak. "Accountability and Flexibility in Public Schools: Evidence from Boston's Charters and Pilots." *Quarterly Journal of Economics*, 126(2), 2011. <https://academic.oup.com/qje/article/126/2/699/1871552>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>35</sup> This 2011 study examines the impact of the Harlem Children’s Zone in New York City, described as “... is a 97-block area in Harlem (a neighborhood in the New York City borough of Manhattan) that combines “No Excuses” charter schools with a web of community services designed to ensure the social environment outside of school is positive and supportive for children from birth to college graduation.” Specifically, the study explores student achievement, alongside other grade completion and attendance/absences for students enrolled in the Promise Academy charter schools. The study leverages Promise Academy’s lottery-based admission system to examine the outcomes for students at the elementary and middle school levels during which the school was over-subscribed. Note that the study can only examine the years for which the school is over-subscribed and for which complete lottery data is available, potentially biasing the results.</p> <p>Using multiple statistical methods, the study finds, on average, students who win the charter lottery and enroll in Promise Academy in elementary school achieve higher in math and ELA by about 0.2 standard deviations per year compared to lottery losers. At the middle school level, the study finds an average improvement of 0.2 standard deviations on the standardized math assessment per year of Promise Academy enrollment for lottery winners. It is also worth noting that Promise Academy students living within <i>and</i> outside of the Harlem Children’s Zone experience roughly the same academic achievement gains, indicating that the school itself is likely responsible for the majority of the impact on student achievement, distinct from the other social services offered within the Harlem Children’s Zone environment.</p>					
<p><u><a href="#">“Explaining charter school effectiveness”</a></u></p>	<p>2013</p>	<p>Angrist, Pathak, &amp; Walters</p>	<p>17 middle schools; 6 high schools</p>	<p>--</p>	<p>--</p>
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>36</sup> This study uses student data from Massachusetts to compare the relative student achievement effects of urban and non-urban charter schools. The study examines 17 middle schools and 6 high schools in urban and non-urban settings that held one or more lotteries between 2001 and 2011 due to over-subscription. The lottery-based analysis portion of the study examines comparison groups of students who applied to an urban or nonurban charter school lottery over the 10-year period.</p> <p>The study finds that lottery-winners who enroll in a charter school in middle or high school experience statistically significant benefits in reading standardized exams (0.08 to 0.21 standard deviations per year) and math standardized exams (0.21 to 0.27 standard deviations per year). However, benefits were stronger for lottery-winners at urban charter schools, while lottery-winners at non-urban charter schools actually experienced average negative effects on math and reading at the middle school level, and non-significant score differences at the high school level. The authors suggest that differential effects of urban and nonurban charters could be due to differences in pedagogical approaches; urban charters tend to follow a “No Excuses” model while nonurban charters do not. However, it should also be noted that students who apply for charter school enrollment in urban and rural settings are also significantly different on multiple demographic and academic fronts, including race/ethnicity, socioeconomic status, and baseline achievement on state exams.</p>					

<sup>35</sup> Dobbie and Fryer. “Are high-quality schools enough to increase achievement among the poor? Evidence from the Harlem Children’s Zone.” *American Economic Journal: Applied Economics*, 2011. [http://www2.econ.iastate.edu/classes/econ321/Orazem/Fryer\\_high\\_quality\\_schools.pdf](http://www2.econ.iastate.edu/classes/econ321/Orazem/Fryer_high_quality_schools.pdf)

<sup>36</sup> Angrist, Pathak, and Walters. “Explaining charter school effectiveness” *American Economic Journal: Applied Economics*, 2013. <http://seii.mit.edu/wp-content/uploads/2012/12/Explaining-Charter-School-Effectiveness.pdf>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Medium-term impacts of high-achieving charter schools on non-test score outcomes"</u></a>	2013	Dobbie & Fryer	1 school; ~407 students	--	--
<p><b>Outcomes of Interest:</b> Cognitive abilities in math and reading (no stakes Woodcock-Johnson exams); academic achievement in core subjects (NYS Regents exams); college enrollment; teenage pregnancy; incarceration; additional self-reported outcomes (risky behaviors, self-reported health, social support, others)</p> <p><b>Summary of Findings:</b><sup>37</sup> This study leverages a lottery-based approach to follow randomly-assigned students years after the charter lottery to identify any differential outcomes associated with charter school enrollment. The study uses student data from the Promise Academy, a charter school associated with the Harlem Children’s Zone in New York City, comparing outcomes for lottery winners and lottery losers at the middle school level six years after their enrollment in Grade 6. The study includes data from student cohorts in 2005 and 2006 and was able to collect follow-up data from 407 out of the initial sample of 570 applicants to the lottery during these years.</p> <p>Six years after enrollment, the study finds significant, positive effects for student achievement on the Woodcock-Johnson assessment (note: this is not a state standardized exam) on the order of 0.28 standard deviations in math and 0.12 standard deviations in reading. The study also finds positive benefits for charter lottery winners in terms of the number of Regents exams passed in high school (1 additional exam) and test scores on the most common Regents exams (0.27 standard deviations higher than lottery losers). Lottery winners who attend the Promise Academy are more likely to enroll in college (14.1 percentage points) and more likely to enroll in a four-year college (21.3 percentage points).</p> <p>Notably, the study finds mixed results on various health outcomes of interest for lottery-winners and lottery-losers. Female lottery-winners were 71 percent <i>less likely</i> to report a pregnancy during their teenage years than lottery losers (about 5 percent compared to about 17 percent). However, other self-reported measures of risky behavior find mixed results, and often no significant difference, between lottery-winners and lottery-losers. There was also no significant difference between self-reported health across the two groups at follow-up.</p>					
<a href="#"><u>"Getting Beneath the Veil of Effective Schools: Evidence From New York City"</u></a>	2013	Dobbie & Fryer	29 schools	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); school characteristics associated with student achievement</p> <p><b>Summary of Findings:</b><sup>38</sup> This study examines charter elementary and middle schools in New York City operating between the years 2003 and 2011. Although a total of 39 charter elementary and middle schools are included in the study, lottery-based findings are only available for 29 schools that 1) were over-subscribed for one or more years, resulting in an admissions lottery and 2) maintained adequate records of lottery winners and losers such that outcomes can be compared. Notably, in addition to gathering information on student achievement outcomes, this study explores school characteristics in an effort to identify elements of schools associated with larger improvements in student achievement.</p>					

<sup>37</sup> Dobbie and Fryer. "Medium-term impacts of high-achieving charter schools on non-test score outcomes." National Bureau of Economic Research, 2013. <https://www.nber.org/papers/w19581>

<sup>38</sup> Dobbie and Fryer. "Getting Beneath the Veil of Effective Schools: Evidence from New York City." *American Economic Journal: Applied Economics* 5(4), 2013. <https://pubs.aeaweb.org/doi/pdfplus/10.1257/app.5.4.28>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>Lottery-based results find that elementary school lottery winners score, on average, 0.11 standard deviations higher in math and 0.06 standard deviations higher in reading per year of charter school enrollment compared to lottery losers. At the middle school level, lottery-winners outperformed lottery-losers in math by about 0.13 standard deviations per year of enrollment; differences in reading test scores were smaller and not significant. In terms of school characteristics, authors find that “traditional inputs” such as class size, per-pupil spending, and teacher certification are not associated with improved student outcomes. Rather, factors <i>more</i> likely to predict student learning gains are policies related to setting high expectations, using data-based instruction, providing frequent teacher feedback, high-dosage tutoring, and increased instructional time. Based on this analysis, these school-level policy factors explain almost half of the variation in performance seen across charter schools.</p>					
<p><b><u>“The potential of urban boarding schools for the poor: Evidence from SEED”</u></b></p>	2014	Curto & Fryer	221 students	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>39</sup> This study examines the impact of a specific charter school: SEED schools. Located in Washington, DC and Baltimore, MD, these schools serve Grades 6 through 12 and “... combine a “No Excuses” charter school model with a 5-day-a-week boarding program,” completely changing a student’s weekday environment. Like all charter schools, SEED schools must admit applicants through a random lottery when there are more applicants than seats available. This study leverages this mechanism to compare lottery-winners who enroll to lottery-losers who do not for the SEED program in Washington, DC in 2007 and 2008.</p> <p>Ultimately, the study finds that being a lottery-winner is associated with higher test scores in math and reading, with a boost of, on average, 0.23 standard deviations in math scores and 0.21 standard deviations in reading scores per year of enrollment in a SEED school. However, authors note that there may be differential benefits for female students, noting that female students tend to experience greater performance gains than their male peers.</p> <p>Finally, it is worth pointing out that, while SEED schools demonstrate a high level of impact, particularly for reading achievement, these types of boarding programs can be very expensive, and findings are likely not applicable or generalizable to other charter schools.</p>					
<p><b><u>“The Medium-Term Impacts of High-Achieving Charter Schools”</u></b></p>	2015	Dobbie & Fryer	1 school	--	--
<p><b>Outcomes of Interest:</b> Cognitive abilities in math and reading (no stakes Woodcock-Johnson exams); academic achievement in core subjects (NYS Regents exams); college enrollment; teenage pregnancy; incarceration; additional self-reported outcomes (risky behaviors, self-reported health, social support, others)</p>					

<sup>39</sup> Curto and Fryer. “Potential of Urban Boarding Schools for the Poor: Evidence from SEED.” *Journal of Labor Economics*, 32(1), 2014.  
<https://www.povertyactionlab.org/sites/default/files/publications/924%20Urban%20Boarding%20Schools%20for%20the%20Poor%20Jan2014.pdf>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>40</sup> An alternative version of the above Promise Academy study for non-achievement outcomes listed above, this study—published in the <i>Journal of Political Economy</i>, examines the academic and non-academic impacts of attendance at the Promise Academy in the Harlem Children’s Zone six years after the Grade 6 lottery (see Dobbie &amp; Fryer, 2013). This study includes data from cohorts of Grade 6 students who entered the charter lottery in 2005 and 2006. The results of this study are the same as those noted in the 2013 study above.</p>					
<a href="#"><u>“What can we learn from charter school lotteries?”</u></a>	2016	Chabrier, Cohodes, & Oreopoulos	113 schools	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); school characteristics associated with student achievement</p> <p><b>Summary of Findings:</b><sup>41</sup> This large-scale, lottery-based study of charter school enrollment pools estimated effects from different studies of charter schools to estimate an overall charter impact. This study identifies and incorporates 16 earlier studies of charter schools that employ a lottery-based methodology to compare applicant students who were randomly assigned to a charter school seat with those who did not win the charter lottery, ultimately including 113 schools. Authors explain that the main research question of interest for this analysis is not simply whether or not charter schools are effective, but rather, what characteristics explain the differences in impact across different types of charter schools.</p> <p>The results of this study suggest that one year of charter school enrollment is associated with small but significant increases on test scores in math and reading, on the order of 0.08 standard deviations and 0.04 standard deviations, respectively. The study notes that there is wide variation in this association by school. Although some characteristics, such as class size, do not explain this variation in student outcomes, the “No Excuses” charter school model emerges as a possible explanation for some of this variation. On further examination, the authors conclude that the “No Excuses” pedagogical approach itself may not explain why certain schools achieve much larger effect sizes; rather, the setting of “No Excuses” charters—typically in large, urban settings with disadvantaged students who tend to have lower baseline test scores—may better explain much of the variation in impact. Including this type of contextual information in the statistical model “weakens” the estimated impact of the “No Excuses” approach on student outcomes. Accordingly, authors note that the success of “No Excuses” charters in some urban centers may not be applicable or generalizable to other settings.</p>					
<a href="#"><u>“An early look at the effects of Success Academy Charter Schools”</u></a>	2017	Unterman	7 schools; 4,710 students	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>42</sup> This evaluation report represents the first lottery-based analysis of the impact of Success Academy Charter Schools, a “No Excuses” charter network based in New York City. The report examines the cohort of students who applied for one of seven Success Academy school lotteries for Kindergarten and Grade 1 for academic year 2010-2011, comparing lottery-winners with lottery-losers to determine any differences in achievement that can be attributed to the school. Authors follow these 4,710 young students through Grade 3 or 4 (depending on grade level at entry) and examines subsequent student achievement on state tests in reading and math.</p>					

<sup>40</sup> Dobbie and Fryer. “The medium-term impacts of high-achieving charter schools.” *Journal of Political Economy*, 123(5), 2015. <https://www.journals.uchicago.edu/doi/full/10.1086/682718>

<sup>41</sup> Chabrier, Cohodes, and Oreopoulos. “What can learn from charter school lotteries?” National Bureau of Economic Research, 2016. <https://www.nber.org/papers/w22390.pdf>

<sup>42</sup> Unterman. “An early look at the effects of Success Academy Charter Schools.” MDRC, 2017. <https://eric.ed.gov/?id=ED575961>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>The report finds that lottery-winners who go on to enroll in a Success Academy school see achievement in math compared to lottery-losers, on the order of about 0.18 to 0.27 standard deviations. The report does not find significant differences in standardized reading exam scores between the two groups by Grades 3-4.</p>					
<p><a href="#"><u>"No excuses charter schools and college enrollment: New evidence from a high school network in Chicago"</u></a></p>	2017	Davis & Heller	1 school	--	--
<p><b>Outcomes of Interest:</b> Postsecondary outcomes (college enrollment, quality, and persistence)</p> <p><b>Summary of Findings:</b><sup>43</sup> This study examines a high-performing charter high school in Chicago, Illinois: Noble Street Charter. Rather than examining student achievement outcomes, this analysis uses lottery data to compare lottery winners who enroll with lottery losers who do not on various postsecondary outcomes. Outcomes of greatest interest include college matriculation/enrollment, quality of postsecondary institution, and persistence in higher education. The study follows three cohorts of students who applied to Noble Street Charter between 2003 and 2005.</p> <p>The results of this study find that lottery winners are 10.0 to 13.5 percentage points more likely to enroll in college (a difference of about 23 percent over the control group average). Further, while the percentage of students who enrolled in two-year colleges was not statistically different between the lottery-winner and lottery-loser groups, lottery-winners were slightly more likely to enroll in a four-year college. While lottery estimates did not find a difference in likelihood of college graduation between the two groups, the study does find a slight but significant effect for lottery-winners on the likelihood of enrolling in at least 2 semesters of college and the likelihood of enrolling in at least 4 semesters of college. It must be noted that, at the time of the study, the youngest cohort of students (entering Grade 9 in 2005) would not yet have finished college, and thus are not included in the "on-time graduation" analysis.</p>					
<p><a href="#"><u>"The impact of Democracy Prep Public Schools on civic participation"</u></a></p>	2018	Gill, et al	1 school network; 1,060 students	--	--
<p><b>Outcomes of Interest:</b> Voter registration rates; voting rates</p> <p><b>Summary of Findings:</b><sup>44</sup> This evaluation report examines the impact of a New York City charter school network—Democracy Prep—on student outcomes related to civic participation (i.e., voter registration and voting) in adulthood. The report leverages the lottery-based charter enrollment system in New York City to compare results for lottery-winners and lottery-losers who applied to enter one or more over-subscribed Democracy Prep schools between 2007 and 2016. The sample was restricted to those students who would be at least 18 years old by the time of the 2016 election; due to this restriction, the analysis only includes those students who applied to enroll in Democracy Prep for Grade 6 or later. This resulted in a total sample of 1,060 students.</p>					

<sup>43</sup> Davis and Heller. "No excuses charter schools and college enrollment: New evidence from a high school network in Chicago." University of Pennsylvania, 2017. [https://faculty.wharton.upenn.edu/wp-content/uploads/2016/11/DavisHeller2015\\_REVISSED.pdf](https://faculty.wharton.upenn.edu/wp-content/uploads/2016/11/DavisHeller2015_REVISSED.pdf); also published in *Education Finance & Policy*, 14(3), 2019. [https://www.mitpressjournals.org/doi/abs/10.1162/edfp\\_a\\_00244](https://www.mitpressjournals.org/doi/abs/10.1162/edfp_a_00244)

<sup>44</sup> Gill, Tilley, Whitesell, Finucane, Potamites, and Corcoran. "The Impact of Democracy prep Public Schools on Civic Participation." Mathematica Policy Research, 2018. <https://www.mathematica.org/our-publications-and-findings/publications/the-impact-of-democracy-prep-public-schools-on-civic-participation>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p>Ultimately, the study finds that lottery-winners achieve a voting rate about 6 percentage points higher than lottery-losers in the 2016 election (26 percent compared to 20 percent). Among lottery-winners who enrolled in Democracy Prep, they achieved a voting rate about 24 percentage points higher than lottery-losers in the 2016 election. Differences in voter registration are generally not statistically significant regardless of statistical method.</p>					
<a href="#"><u>"Estimating the effects of a large for-profit charter school operator"</u></a>	2018	Dynarski, Hubbard, Jacob, & Robles	2018	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores); attendance; grade progression; discipline; special education placement</p> <p><b>Summary of Findings:</b><sup>45</sup> This study examines the impact of a specific, for-profit charter school operator: National Heritage Academy (NHA). At the time of publishing, NHA operated more than 86 schools across nine states, all of which are brick-and-mortar (rather than virtual charter schools). Estimates in the study are drawn from a sample of 44 NHA schools that held one or more enrollment lotteries between 2003 and 2012, comparing students who won the charter school lottery and enrolled with those who lost the charter school lottery and did not enroll.</p> <p>Ultimately, this study finds that a year of enrollment in an NHA charter school results in a small improvement in math scores—0.04 standard deviations—for lottery winners compared to lottery losers. However, the study finds no significant difference between the treatment and control groups for any other outcome, including reading achievement. Notably, the authors comment that the benefits of attendance at an NHA charter are more often clustered toward students of higher socioeconomic status and those in non-urban areas.</p>					
<a href="#"><u>"Evaluation brief: Do charter middle schools improve students' college outcomes?"</u></a>	2019	Place & Gleason	2,873 students	--	--
<p><b>Outcomes of Interest:</b> Postsecondary enrollment (ever); earned a post-secondary degree or credential (bachelor's, associate's, certificate, etc.); additional exploratory variables surrounding postsecondary outcomes</p> <p><b>Summary of Findings:</b><sup>46</sup> In this study, researchers conduct a follow-up evaluation on the 31 charter middle schools initially evaluated in the 2010 National Evaluation of Charter Middle Schools study (see Gleason et al, 2010). The original study used a lottery-based approach to examine short-term academic achievement outcomes for lottery winners and lottery losers at the middle school level. This study builds on these initial results, matching the original, lottery-based sample of students to their post-secondary data using the National Student Clearinghouse.</p> <p>The study finds that, compared to students who entered but did not win the charter lottery, lottery winners are no more likely to enroll in college, persist, or complete their degree. Further, student achievement gains that may be attributable to charter school enrollment (see the original study) were not related to post-secondary outcomes.</p>					

<sup>45</sup> Dynarski, Hubbard, Jacob, and Robles. "Estimating the effects of a large for-profit charter school operator." National Bureau of Economic Research. <https://www.nber.org/papers/w24428>

<sup>46</sup> Place and Gleason. "Evaluation brief: Do charter middle schools improve students' college outcomes?" Institute for Education Sciences, 2019. <https://ies.ed.gov/ncee/pubs/20194005/>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Can successful schools replicate? Scaling up Boston's charter school sector"</u></a>	2019	Cohodes, Setren, & Walters	14 schools	--	--
<p><b>Outcomes of Interest:</b> Academic achievement (reading and math standardized test scores)</p> <p><b>Summary of Findings:</b><sup>47</sup> This recent study examines student outcomes associated with "No Excuses" charter schools in Boston, Massachusetts over the time period 2004 through 2013. In particular, this study examines the impact of a policy that allows charter schools that demonstrate "success" in the city to replicate their programming at additional campuses or sites. During the years 2010 through 2014, the number of charter schools operating in Boston increased rapidly from 16 to 32. Accordingly, this study examined student outcome data—using a lottery-based analysis to compare similar groups of students who won or lost a seat in a charter school—to examine the overall impact of charters on student performance as well as the impact of new charters opened as a result of the expansion policy. Specifically, the study examines students entering Grades 5 or 6 across 14 of the 15 charter middle schools operating in the city that begin enrolling students at these grade levels.</p> <p>Results of the study find, overall, winning a lottery seat to a charter school is associated with a significantly positive increase in math and reading test scores for Grade 6 students on the order of 0.18 to 0.32 standard deviations and 0.1 standard deviations, respectively. The study delves into greater detail by comparing student outcomes from charter schools before, during, and after the "expansion" period in 2010 through 2014, finding relatively consistent results in terms of student achievement gains. So-called "proven provider" charter schools that were permitted to replicate existing programs continued to report high student achievement gains at their original locations, while showing similar achievement gains for student lottery winners at new sites opened during the reform period, although data may be limited somewhat by the lack of lottery data for years when any given charter school was not over-subscribed. Note that the results of this study suggest that successful charter schools can be replicated within a large urban district while maintaining positive benefits for students.</p>					

<sup>47</sup> Cohodes, S, Setren, E, and Walters, CR. "Can successful schools replicate? Scaling up Boston's charter school sector." National Bureau of Economic Research, 2019. <https://www.nber.org/papers/w25796>



## SECTION IV: COMMON ENROLLMENT/UNIFIED ENROLLMENT SYSTEMS

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

With increasing school choice options for parents and students in districts across the country, the logistics of choosing a school has become more complex. Strategies like common enrollment applications and unified enrollment systems aim to streamline the school choice process. First, Hanover reviewed the research related to common enrollment application systems for K-12 education and did not identify randomized controlled trials on this topic. Second, Hanover reviewed the literature related to unified enrollment systems, considered the most evolved form of the common enrollment application system, as this type of system includes all schools in the district. As with common application systems, we did not identify any randomized controlled trials for unified enrollment systems. As of September 2018, just six school districts in the United States had implemented such a system, although another four cities were “considering or implementing unified enrollment systems.”<sup>48</sup>

An emerging area of RCT research related to common enrollment applications and unified enrollment systems appears to be providing **informational interventions** for families to help navigate the enrollment process, as identified in the table below. Note that the identified studies have not been examined by WWC.

### SUMMARY OF FINDINGS

As shown in the figure below, Hanover identified two RCTs related to informational interventions to help students and parents navigate complex school choice enrollment systems. First, a 2018 study of more than 19,000 middle school students in New York City Public Schools randomized an informational intervention to help Grade 8 students identify high-performing high school options in their geographic area across 165 middle schools. The study found that a simple list of school choices, ranked by graduation rate, alongside information about the logistics of the application process and relevant public transportation information, was able to change the high school application behavior of Grade 8 students and, ultimately, the quality of schools that they “matched” to through the school choice process. In 2019, Weixler et al found that parents of young children who received text message-based outreach were more likely to complete the verification process to enroll their child in free, public early childhood education (ECE) programs in New Orleans. Children of parents in the treatment groups were also more likely to be enrolled in ECE programs one year later.

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<sup>48</sup> Hesla, K. “Unified Enrollment: Lessons Learned from Across the Country.” National Alliance for Public Charter Schools, 2018.  
[https://www.publiccharters.org/sites/default/files/documents/2018-09/rd3\\_unified\\_enrollment\\_web.pdf](https://www.publiccharters.org/sites/default/files/documents/2018-09/rd3_unified_enrollment_web.pdf)

**Figure 4.1: RCTs Related to Common Enrollment/Unified Enrollment Systems**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Leveling the Playing Field for High School Choice: Results from a Field Experiment of Informational Interventions"</u></a>	2018	Corcoran, et al	165 schools, 19,109 students	---	---
<p><b>Outcomes of Interest:</b> Student application to high-performing high schools; student "match" to a high-performing high school; student "match" to their top choice of school</p> <p><b>Summary:</b><sup>49</sup> This study examined the impact of an informational intervention provided directly to Grade 8 students in New York City Public Schools to help them navigate the school choice process for high school. Treatment status was randomized at the school level (to avoid spillover effects) at 165 middle schools across the city. Students in the treatment arm of the intervention received an informational resource unique to their middle school location that "...explained admissions methods in plain language, listed schools in descending order by graduation rate, and reported estimated travel time by public transportation from the middle school." The study defined "high-performing" schools as those with a graduation rate above the city median (70%), and "low-performing" schools as those below the median.</p> <p>Ultimately, the study found that students who received the informational intervention were more likely to apply to a recommended school (i.e., one with a higher graduation rate) than control students. Students at treatment schools were also more likely to match to their top choice school, and tended to match to a high school with, on average, a graduation rate 1.7 percentage points higher than students in the control group. Finally, the study found the informational intervention had stronger positive effects for high-performing students compared to low-performing students, White and Asian students compared to Black and Hispanic students, and for English language learners compared to similar students who primarily speak English at home.</p>					
<a href="#"><u>"Helping Parents Navigate the Early Childhood Enrollment Process: Experimental Evidence from New Orleans"</u></a>	2019	Weixler, et al	1,224 parents of 1,407 students	---	---
<p><b>Outcomes of Interest:</b> Parent completion of verification process; child enrolled in ECE program one year later</p> <p><b>Summary:</b><sup>50</sup> This study examined the effects of a text-messaging intervention which helped parents verify their children's eligibility in a publicly-funded ECE program in New Orleans. Parents were assigned to three groups: a control group that received standard communications from the district (414 parents); a treatment group that received additional weekly text message reminders in a formal tone (400 parents); a second treatment group that mirrored the first, but with weekly texts that were personal and casual in tone and invited a response (410 parents). Overall, text messages were found to help parents overcome eligibility verification barriers, with parents receiving messages being 7 percentage points more likely (i.e., 67% vs. 60%) to complete verification. Informal text messaging also yielded higher enrollment rates than formal texts. Specific data is recorded on pp. 38-39.</p>					

<sup>49</sup> Data and summary taken from: Corcoran, Jennings, Cohodes, and Sattin-Bajaj. "Leveling the Playing Field for High School Choice: Results from a Field Experiment of Informational Interventions." National Bureau of Economic Research, 2018. <https://www.nber.org/papers/w24471.pdf>

<sup>50</sup> Data and summary taken from: Weixler, L. et al. "Helping Parents Navigate the Early Childhood Enrollment Process: Experimental Evidence from New Orleans." Education Research Alliance for New Orleans, Tulane University, June 6, 2019. pp. 1, 3-4, 16, 38-39. [https://educationresearchalliancenola.org/files/publications/Weixler-et-al-ECE-RCT-6\\_7.pdf](https://educationresearchalliancenola.org/files/publications/Weixler-et-al-ECE-RCT-6_7.pdf)

# SECTION V: INTER-/INTRA-DISTRICT ENROLLMENT

## AVAILABLE RESEARCH – METHODS & LIMITATIONS

Hanover was unable to identify any RCTs focused specifically on “intra-district enrollment,” “inter-district enrollment,” or “open enrollment.” Rather, there are a number of studies that use the presence of such systems—particularly those that include elements of randomization—to **examine the impact of specific types of schools, such as public charters or magnet schools**. For example, Figure 5.1 below examines the impact of Connecticut’s inter-district magnet schools.

The Great Lakes Center for Education Research & Practice notes in its brief on school choice evidence that “school choice policies are seldom implemented as controlled experiments” and that it is difficult to compare the level of competition or its impact across localities that have enacted open enrollment policies or district-level school choice systems.<sup>51</sup>

## SUMMARY OF FINDINGS

The study of Connecticut’s inter-district magnet schools is described in detail in the figure below. These inter-district magnets were created as an explicit strategy to reduce segregation in the state’s public school systems and exist in three Connecticut locations: Hartford, Waterbury, and New Haven. This study leverages the random lottery admission policy to compare outcomes for students who win the admission lottery and enroll in the school and to those who lose the admission lottery and do not enroll. Within the study, authors conclude that there are some statistically significant benefits to inter-district magnet attendance for lottery-winners compared to those who entered the lottery but did not win on standardized assessments in math (0.14 standard deviations) and literacy (0.28 standard deviations) at Grade 8. However, while WWC rates the study as meeting standards without reservations, the expert panel interpret the study findings slightly differently from the study authors; the WWC report concludes that inter-district magnet school enrollment has an indeterminate impact on mathematics outcomes in Grade 8, and a positive impact on literacy outcomes at Grade 8.

**Figure 5.1: RCTs Related to Inter-/Intra-District Enrollment**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#">“Can Interdistrict Choice Boost Student Achievement? The Case of Connecticut’s Interdistrict Magnet School Program”</a>	2009	Bifulco, Cobb, & Bell	553	Meets WWC Standards w/o reservations	No statistically significant positive findings
<b>Outcomes of Interest:</b> Academic achievement (Connecticut Mastery Test – Grade 8 Math and Reading)					

<sup>51</sup> Miron, G., Welner, K.G., Hinchey, P.H., and Molnar, A. “School Choice: Evidence and Recommendations.” Great Lakes Center for Education Research & Practice, 2008. [https://greatlakescenter.org/docs/Research/2008charter/policy\\_briefs/all.pdf](https://greatlakescenter.org/docs/Research/2008charter/policy_briefs/all.pdf)

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>52</sup> This study attempts to measure the impacts of Connecticut's inter-district magnet school program on student's academic achievement. In terms of sampling, the study reviews two magnet schools (one Grades 6-8 and another Grades 6-12) with admissions procedures partially based on random assignment and lottery. The study begins with a sample of 553 students who entered the lottery for inter-district magnet admission at the end of Grade 5, of which 142 were admitted to a magnet school on-time (i.e., Grade 6), 22 received delayed admission, and 389 did not receive admission. Ultimately, 517 students were followed through Grade 8. Using a treatment-on-the-treated model, the study finds that the magnet schools have a positive impact on student achievement (see pp. 335), with reading test scores being 0.28 standard deviations higher in reading and 0.14 in math. Stats for different groups are available on p. 339.</p> <p>It should be noted that WWC rates this study, overall, as "Meets WWC Standards Without Reservations," but concludes that the study has "no statistically significant positive findings." Closer review of the WWC conclusions show that the panel considers the analysis for mathematics displays "indeterminate" effects for magnet school students, although it rates the analysis for literacy outcomes as "statistically significant positive findings" for magnet school students.</p>					

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<sup>52</sup> Data and summary taken from: [1] Bifulco, R., C.B. Cobb, and C. Bell. "Can Interdistrict Choice Boost Student Achievement? The Case of Connecticut's Interdistrict Magnet School Program." *Educational Evaluation and Policy Analysis*, 31:4, December 2009. Accessed via SAGE Journals. [2] "Can Interdistrict Choice Boost Student Achievement? The Case of Connecticut's Interdistrict Magnet School Program." What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/81476>

## SECTION VI: SCHOOL SIZE

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

Hanover reviewed the literature surrounding school size and identified a small number of studies that use randomization in their methodology for examining school size as a treatment factor; it should be noted that all three studies that place in the same—and somewhat unique—setting: New York City Public Schools. Further, while all studies were reviewed by the WWC, the study series by Bloom, Thompson, and Unterman (2010) and Bloom and Unterman (2013) were determined to meet WWC standards of evidence. WWC found the remaining study did not meet its standards of evidence (Abdulkadiro, Hu, and Pathak, 2013).

It should also be noted that a review of the research on the effect of high school size conducted by Linda Darling-Hammond, Peter Ross, and Michael Milliken identified the “lack of randomized trials, scarcity of controlled comparison group designs, inattention in many correlational studies to selection effects, size values, and nonlinear relationships, and absence of modeling that takes multiple levels of variables into account” as obstacles to examining and estimating the true effects of school size.<sup>53</sup>

### SUMMARY OF FINDINGS

As previously noted, all three RCT studies identified for this review consider the same general group of small high schools in New York City. The schools under consideration span Grades 9 through 12 and are purposefully small, tending to enroll around 100 students per grade level. All schools are considered “schools of choice,” because students must apply through the City’s centralized high school enrollment system. However, the schools are non-selective, meaning that there are no entry requirements, and that any of the schools that are over-subscribed are assigned at random through a lottery. Accordingly, all three studies leverage this admissions process to compare lottery winners who enroll in a small school to lottery losers who enroll in another school option, which, theoretically, minimizes differences in the treatment and comparison groups.

As shown in the figure on the following page, all three studies suggest positive results associated with small schools of choice, including improved 4-year graduation rates and increased credit accumulation (Bloom, Thompson, and Unterman (2010), Bloom and Unterman (2013), and Abdulkadiro, Hu, and Pathak (2013)). The 2013 study by Abdulkadiro, Hu, and Pathak examined a variety of additional student outcomes, including standardized test scores on New York State’s Regents exams, attendance, college entrance exam scores (PSAT/SAT), and postsecondary outcomes. The researchers find that students in small schools outperformed control group students for nearly all of the identified outcomes; however, these results should be taken with caution, as WWC rates the study as failing to meet standards, primarily due to concerns about the comparability or equivalency of treatment and control groups.

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<sup>53</sup> Darling-Hammond, L., Ross, P., and Milliken, M. “High School Size, Organization, and Content: What Matters for Student Success?” Stanford Center for Opportunity Policy in Education. <https://edpolicy.stanford.edu/sites/default/files/publications/high-school-size-organization-and-content-what-matters-student-success.pdf>



**Figure 6.1: RCTs Related to School Size**

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Small High Schools and Student Achievement: Lottery-Based Evidence from New York City"</u></a>	2013	Abdulkadiro, Hu, & Pathak	108 schools ~21,085 students	Does not meet WWC standards	--
<p><b>Outcomes of Interest:</b> Academic achievement (NYS Regents tests in math, English, living environment, global history, and U.S. history); credits earned; attendance; graduation rates; PSAT/SAT scores; postsecondary/college enrollment and remediation</p> <p><b>Summary of Findings:</b><sup>54</sup> This study examines students across 108 small schools of choice in New York City Public Schools. The study leverages the partial random assignment used in the school district's high school choice application system to compare students who ranked small schools of choice among their top school choices and either were assigned to such a school (treatment group) or were not assigned to such a group (control group). The study authors note that more than 90 percent of the study sample are Black or Hispanic, and 70 percent or more qualified for free or reduced-price lunch.</p> <p>Compared to students who applied but were not assigned to small high schools of choice, the study finds students at small high schools earned higher standardized test scores in math, English, science, and history, accumulated more credits, achieved higher graduation rates, and were more likely to enroll in college. Students are also less likely to require collegiate remediation in reading and writing and indicate they are more engaged. Teachers also report greater safety and improved collaboration. Within the study, specific results are provided on the following pages:</p> <ul style="list-style-type: none"> <li>▪ Regents scores (p. 44)</li> <li>▪ Credits and attendance (p. 45)</li> <li>▪ High school graduation and college remediation (p. 46)</li> <li>▪ College choice, enrollment, and persistence (p. 47)</li> <li>▪ Results by sub-group (p. 48)</li> <li>▪ College Board outcomes (p. 61)</li> </ul> <p>It must be noted that WWC determined that this study <b>did not</b> meet standards for quality of evidence, noting that the "... equivalence of the analytic intervention and comparison groups is necessary and not demonstrated."</p>					

<sup>54</sup> Data and summary drawn from: [1] Abdulkadiroğlu, A., W. Hu, and P.A. Pathak. "Small High Schools and Student Achievement: Lottery-Based Evidence from New York City." National Bureau of Economic Research, October 2013. pp. ii, 4, 9, 18–25, 44–48, 61. <http://www.nber.org/papers/w19576.pdf> [2] "Small High Schools and Student Achievement: Lottery-Based Evidence from New York City." What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/81467>

STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<a href="#"><u>"Sustained Progress: New Findings About the Effectiveness and Operation of Small Public High Schools of Choice in New York City"</u></a>	2013	Bloom & Unterman	14,969 students	Meets WWC Standards w/o reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> 4-year graduation rate; diploma type</p> <p><b>Summary of Findings:</b><sup>55</sup> In 2013, Bloom and Unterman published a follow-up study to the initial report on outcomes from New York City's "small schools of choice," explained in further detail in the 2010 study description below. In short, the study follows four cohorts of rising Grade 9 students who applied to one or more of New York City's small high schools of choice (or, schools that typically enroll about 100 students per grade level in Grades 9-12), examining differences in graduation rates and diploma types between students who applied and were enrolled in the small schools with those who applied but were not assigned to small schools. Like many studies on the impact of schools of choice, this study leverages the random assignment of student applicants when individual schools of choice are over-subscribed. The study also conducted interviews and focus groups with principals and teachers at "successful" small schools.</p> <p>The 2013 iteration of the study finds significant, positive impacts of small school enrollment on 4-year graduation rates, including across various student subgroups. In particular, this study finds that:</p> <ul style="list-style-type: none"> <li>▪ SSCs in New York City continue to markedly increase high school graduation rates for large numbers of disadvantaged students of color, even as graduation rates are rising at the schools with which SSCs are compared.</li> <li>▪ The best evidence that exists indicates that SSCs may increase graduation rates for two new subgroups for which findings were not previously available: special education students and English language learners.</li> <li>▪ Principals and teachers at the 25 SSCs with the strongest evidence of effectiveness strongly believe that academic rigor and personal relationships with students contribute to the effectiveness of their schools. They also believe that these attributes derive from their schools' small organizational structures and from their committed, knowledgeable, hardworking, and adaptable teachers (see pp. 6, 8, 10-12, 18, 47, 55 for effect sizes and data supporting preceding bullets).</li> </ul> <p>Unlike the 2010 iteration of the study, WWC found the 2013 follow-up study to meet standards of evidence without reservations. WWC concludes the study presents sufficiently strong evidence of a positive impact on 4-year graduation rates for high school students enrolled in a small school of choice; notably, treatment group students (i.e., those in small schools of choice) observed a 4-year graduation rate of 64.6, compared to a rate of 56.1 in the control group.</p>					
<a href="#"><u>"Transforming the High School Experience: How New York City's New Small Schools are Boosting Student Achievement and Graduation Rates"</u></a>	2010	Bloom, Thompson, & Unterman	21,085 students 105 schools	Meets WWC Standards with reservations	At least one statistically significant positive finding
<p><b>Outcomes of Interest:</b> Grade 9 on-track-for-graduation indicators; earned 10 or more credits by end of Grade 9; earned 20 or more credits by end of Grade 10; earned 30 or more credits by end of Grade 11; total credits earned (all grade levels); on-time graduation at end of Grade 12; diploma type (i.e., local, Regents, Advanced Regents)</p>					

<sup>55</sup> Summary and data adapted from: [1] Bloom, H.S. and R. Unterman. "Sustained Progress: New Findings About the Effectiveness and Operation of Small Public High Schools of Choice in New York City." MRDC. August 2013. pp. iii, 3, 6, 8, 10-12, 18, 47, 55. <https://files.eric.ed.gov/fulltext/ED545475.pdf> [2] "Sustained Progress: New Findings About the Effectiveness and Operation of Small Public High Schools of Choice in New York City." What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/78538>



STUDY	YEAR	AUTHORS	PARTICIPANTS	WWC RATING	WWC FINDINGS
<p><b>Summary of Findings:</b><sup>56</sup>This study examines the results of students assigned to small high schools in New York City Public Schools, defined as schools serving approximately 100 students per grade in Grades 9 through 12. Note that the high schools included in the study are small, academically non-selective, and typically located in disadvantaged neighborhoods by design. The study leverages New York City’s high school admissions process, through which students rank their top choices for high school in Grade 8, and enrollment for over-subscribed schools are determined by a random lottery. As the small schools in the study are all non-selective schools of choice, this study examines outcomes for students who applied for and were selected to enroll in small schools or choice compared to those who applied for and were not selected to enroll in small schools of choice and ultimately enroll in other high school options offered by New York City Public Schools. The study followed four cohorts of students entering Grade 9 in Fall 2005 through Fall 2008 who had applied to enroll at one or more small schools of choice; across these 21,085 students, those who enrolled in small schools of choice experienced an average Grade 9 cohort size of 129 students, while those who were not assigned to small schools of choice experienced an average Grade 9 cohort size of 635 students. .</p> <p>In particular, this study finds that:</p> <ul style="list-style-type: none"> <li>▪ By the end of their first year of high school, 58.5 percent of SSC enrollees are on track to graduate in four years compared with 48.5 percent of their non-SSC counterparts, for a difference of 10.0 percentage points. These positive effects are sustained over the next two years.</li> <li>▪ By the fourth year of high school, SSCs increase overall graduation rates by 6.8 percentage points, which is roughly one-third the size of the gap in graduation rates between white students and students of color in New York City.</li> <li>▪ SSCs’ positive effects are seen for a broad range of students, including male high school students of color, whose educational prospects have been historically difficult to improve.</li> <li>▪ SSCs positively impact credits-earned, course failure, on-track status to graduation, on-time graduation rates (see pp. ES.6, 41, 44-45, 49-50, 52-53, 99-102 for data supporting prior bullets)</li> </ul> <p>Note that the WWC rates this study as meeting recommendations with reservations, recognizing that the data suggests a statistically significant, positive increase in credit accumulation for students in Grades 10 and 11.</p>					

<sup>56</sup> Data and summary adapted from: [1] Bloom, H.S. et al. “Transforming the High School Experience: How New York City’s New Small Schools Are Boosting Student Achievement and Graduation Rates.” MRDC, June 2010. <https://files.eric.ed.gov/fulltext/ED511106.pdf> [2] “Transforming the High School Experience: How New York City’s New Small Schools Are Boosting Student Achievement and Graduation Rates.” What Works Clearinghouse | Institute of Education Sciences. <https://ies.ed.gov/ncee/wwc/Study/78545>

## SECTION VII: PORTFOLIO MANAGEMENT

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

A review of the literature surrounding portfolio school district management did not identify any randomized controlled trials. It should be noted that it would be particularly challenging to conduct such a study of this approach, as portfolio management is a district level strategy, and it would be logistically challenging to truly randomize students across district lines. The Center for Reinventing Public Education (CRPE)—an organization that advocates for the portfolio approach—describes the state of the research as follows:

Studies of high-performing schools across the private, district, and charter sectors have identified empowered school leaders and coherent school designs as key drivers of their success. The portfolio strategy is about creating the policy and system conditions and incentives that would allow high-performing schools to thrive. Sustained student improvement outcomes in Chicago, Denver, Washington, D.C., and New York City, as well as promising early results in Camden, New Orleans, and Indianapolis, suggest that the portfolio strategy has the potential to foster thriving schools at scale across a city, rather than just in pockets.

That said, **causal studies of the strategy are complex endeavors**: the portfolio strategy is more than a single idea. It involves many different policies and actors working together, and may entail different interventions in different cities depending on the local context. In an upcoming project, CRPE hopes to engage a panel of experts to develop a research agenda and program to identify how well the key policies associated with the portfolio strategy positively impact educator job satisfaction, public engagement, and student learning.<sup>57</sup>

Further, a recent study of the Portfolio Management Model's implementation in New Orleans, Louisiana—not a randomized controlled trial—remarks that the early research on this approach is still evolving:

Although the PMM is spreading across the U.S., there is little empirical evidence on the effectiveness of the PMM in improving student outcomes (Strunk et al Forthcoming) or the variation in school quality among the educational options within a portfolio district (Berends & Waddington, 2014). To date, the majority of the research has focused on the design, implementation, and political aspects of portfolio districts (Bulkley et al., 2010; Hill et al., 2009; Hill, Campbell & Gross, 2013).<sup>58</sup>

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<sup>57</sup> Emphasis added; "Frequently Asked Questions About the Portfolio Strategy." CRPE. <https://www.crpe.org/content/portfolio-faq>

<sup>58</sup> McEachin, A., et al. "The variation in student achievement and attendance within a Portfolio Management Model: Early results from New Orleans." 2015, pp. 1-2. [https://static1.squarespace.com/static/50c69b8de4b0c1ce70451157/t/5553747fe4b0bd736884acf3/1431532671676/EEPA\\_Revisions\\_1\\_03302015\\_FINAL.pdf](https://static1.squarespace.com/static/50c69b8de4b0c1ce70451157/t/5553747fe4b0bd736884acf3/1431532671676/EEPA_Revisions_1_03302015_FINAL.pdf)

## SECTION VIII: SCHOOL TAKEOVER

### AVAILABLE RESEARCH – METHODS & LIMITATIONS

School takeover is a strategy that states districts may employ when an individual school is chronically underperforming. The strategy is most-often associated with the No Child Left Behind Act, under which school takeover by the state is one of several options that school districts may pursue when a school failed to meet performance requirements defined by the law for more than five years.<sup>59</sup> Under the current federal education law—the Every Student Succeeds Act (ESSA)—school takeover as a mechanism for states to change the governance structure of underperforming schools after initial intervention and support is explicitly addressed in 25 state ESSA plans.<sup>60</sup> However, it should be noted that “[a]pproaches vary in terms of degrees of control, timeline and progression of implementation, and level of detail provided.”<sup>61</sup>

A review of the literature surrounding school takeover did not identify any randomized controlled trials. A 2005 series on different school turnaround strategies notes that “... there are no examples to date of districts that have voluntarily allowed the state to take over individual low-performing schools, there is no research base to indicate under what conditions this option would lead to improved academic outcomes for students or why a state would take this path.”<sup>62</sup> This suggests that the school takeover strategy may only be used in particularly difficult and fraught cases, and that it may not be feasible, ethical, or legal to randomly assign school takeover as a strategy for chronically under-performing schools.

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<sup>59</sup> Steiner, LM, Kowal, JM, Arkin, MD, Hassel, BC, and Hassel, EA. “State Takeovers of Individual Schools.” Learning Point Associates and North Central Regional Educational Laboratory, 2005. <https://files.eric.ed.gov/fulltext/ED489527.pdf>

<sup>60</sup> Batel, S. “Do ESSA Plans Show Promise for Improving Schools?” Center for American Progress, 2018. <https://www.americanprogress.org/issues/education-k-12/news/2018/02/02/445825/essa-plans-show-promise-improving-schools/>

<sup>61</sup> Ibid.

<sup>62</sup> Steiner, Kowal, Arkin, Hassel, and Hassel, Op. cit., p. 5.

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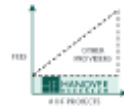
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