

Evaluation of the DC Opportunity Scholarship Program

Impacts Three Years After Students Applied

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Disclosure of Potential Conflicts of Interest

None of the research team members has financial interests that could be affected by findings from the evaluation of the DC Opportunity Scholarship Program (OSP). No one on the six-member technical working group, convened by the research team four times to provide advice and guidance, has financial interests that could be affected by findings from the evaluation.

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1. Introduction

The District of Columbia (DC) Opportunity Scholarship Program (OSP) is the only federally funded program that provides vouchers to low-income families to send their children to private schools. Congress created the OSP in 2004 and reauthorized it in 2011 under the Scholarships for Opportunity and Results (SOAR) Act.¹ As part of the 2011 SOAR Act, Congress required an independent evaluation of the OSP. This is the sixth² and final report from that evaluation, describing how the OSP affected students and their parents three years after they applied to the program. Specifically, the report examines impacts on student achievement, student and parent satisfaction with schools, student and parent perceptions of school safety, and parent involvement with education.

Overview of the Program

The SOAR Act establishes criteria for student eligibility, the groups of students who receive priority for scholarships, and scholarship dollar amounts (exhibit 1). A program operator administers the OSP through a grant awarded by the U.S. Department of Education. Program operators establish protocols for families applying to the program, recruit applicants and schools, award scholarships, and place and monitor scholarship awardees in participating private schools (see appendix A-1 for more information). Participating private schools must agree to requirements regarding nondiscrimination in admissions, fiscal accountability, having teachers with at least a bachelor's degree, and cooperation with an evaluation of the program.

Exhibit 1. Key elements of the Opportunity Scholarship Program as defined in the SOAR Act

Student eligibility criteria

- DC resident
- Income at or below 185 percent of the federal poverty line at application

Priority given to students who:

- Had a sibling already in the program
- Attended a low-performing school in need of improvement
- Were offered a scholarship in the past but did not use it
- Were not already taking advantage of school choice

Initial scholarship amount

- \$8,000 for grades K–8
- \$12,000 for grades 9–12

Overview of the Evaluation

Congress required the evaluation to use “the strongest possible research design” to measure the impacts of being offered and using an OSP scholarship on key outcomes (exhibit 2).³ To determine the OSP's effectiveness, an experiment—considered the “gold standard” of evaluation methodology—was conducted that compared outcomes for two groups. The treatment group was comprised of students who applied for a scholarship and were offered one. The control group was comprised of students who applied

¹ See <http://www.gpo.gov/fdsys/pkg/BILLS-112hr471eh/pdf/BILLS-112hr471eh.pdf> for the SOAR Act legislation. The program was reauthorized in the Omnibus Reconciliation Act for 2017 spending, H.R. 244.

² Congress required annual reports from the evaluation. The first three described the characteristics of program applicants and participating schools, parents' considerations in applying to the OSP, and how participating schools differed from traditional public and charter schools in DC that OSP applicants might be able to attend. The fourth and fifth reports described the impacts of the OSP one and two years after families applied to the program. Reports are available at: https://ies.ed.gov/ncee/projects/evaluation/choice_soar.asp

³ Section 3009 of the SOAR Act also required the evaluation to examine retention, high school graduation, and college admission rates. However, because the majority of the evaluation's sample was in elementary school (see figure 1) these outcomes were not examined in this report.

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for a scholarship but were not offered one. Lotteries were used to randomly award scholarships to applicants. Randomization helped to ensure that the two groups being compared were truly similar at the time of OSP application, and that—other than by chance—the only difference that could influence outcomes was whether applicants received a scholarship offer or not.

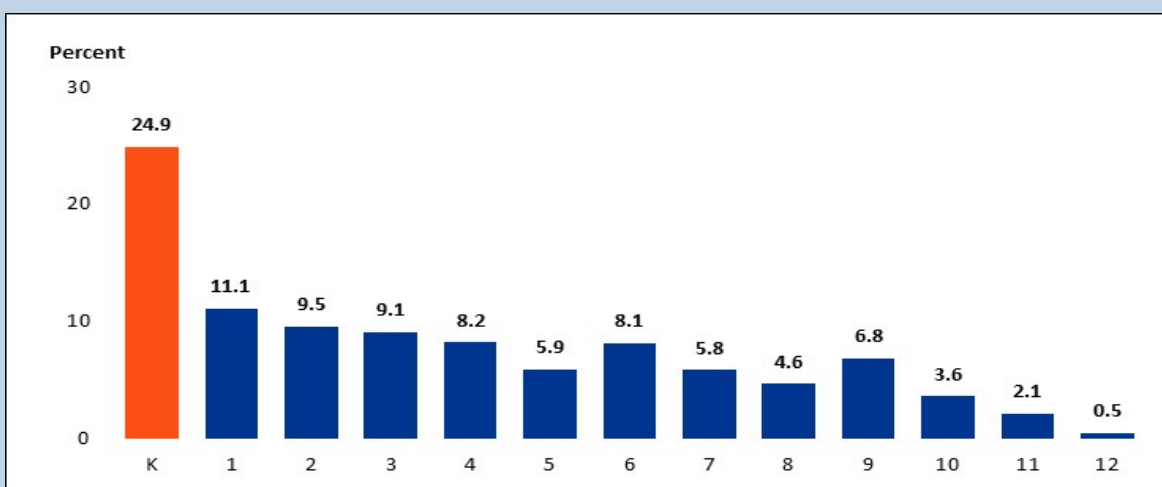
The evaluation included:

- *An initial study sample of 1,771 eligible applicants, of which 56 percent were offered scholarships.*⁴ Program applicants participated in lotteries conducted in spring or summer of 2012, 2013, and 2014. When they applied to the OSP, most were young (68 percent were entering elementary grades K–5, figure 1), low performing (scoring at the 34th percentile in reading and the 32nd percentile in mathematics nationally), and attending a school in need of improvement (64 percent). With the exception of those who were in pre-Kindergarten at application (25 percent), applicants were split between previously attending traditional public schools (40 percent) and charter schools (36 percent).

Exhibit 2. Key evaluation questions

- 1. Reading and Mathematics Achievement**
What is the effect of receiving/using an OSP scholarship on reading and mathematics achievement?
- 2. Satisfaction**
What is the effect of receiving/using an OSP scholarship on parent and student satisfaction with the student’s school?
- 3. School Safety**
What is the effect of receiving/using an OSP scholarship on parent and student perceptions of school safety?
- 4. Parent Involvement**
What is the effect of receiving/using an OSP scholarship on parent involvement in their child’s education at home and at school?

Figure 1. Percentage of eligible applicants, by entering grade level at time of application



NOTE: Percents may not add to 100 because of rounding.

SOURCE: OSP applications.

⁴ As expected, the characteristics (including achievement) of the treatment and control groups when they first applied to the OSP were similar. For example, average reading scores at the time of application were 561 for the treatment group and 563 for the control group. Appendix A-3 provides additional detail on the study’s sample.

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- **Use of a nationally normed achievement assessment, as required in the SOAR Act.** Students were tested both when they applied to the OSP and each spring for three years afterwards in the schools they were attending.⁵ Students and parents were also surveyed each spring for three years, and principals were surveyed each year of data collection. Because families moved (sometimes out of DC) or refused to participate in data collection, and students were sometimes absent when the study team conducted testing, the analysis of program impacts each year was based on a subset of the initial study sample—those who provided data that year.
- **Standard approach to estimating impacts of being offered and of using a scholarship.** The *impacts of a scholarship offer* were based on a comparison of outcomes of the treatment group and outcomes of the control group, taking into account students' achievement and student and parent characteristics at the time of application (see appendix B-3 for more information). However, 22 percent of students in the treatment group did not use a scholarship within the first three years,⁶ and it is unlikely that these students were affected by the program. Therefore, the evaluation also estimated the *impacts of using a scholarship*.⁷ Both analyses included the students and parents who provided data in the third year (63 to 70 percent, depending on the outcome being measured), and used weighting adjustments to account for those who did not respond to surveys or complete testing.⁸
- **Impacts estimated for the whole sample and for specific student groups.** The study examined program impacts for students attending schools in need of improvement⁹ since the SOAR legislation designated this group of students as a priority for scholarship awards. To explore hypotheses about how the OSP works and for whom, and to be consistent with the previous evaluation of the program (Wolf et al., 2010), the study also examined impacts for several other subgroups of students (exhibit 3), as measured at time of application.

Exhibit 3. Impacts were measured for the following student groups:

- All students
- Students attending or not attending a school in need of improvement
- Students scoring above or below the median in reading
- Students scoring above or below the median in mathematics
- Students entering elementary grades (K–5) or secondary grades (6–12)

⁵ PL 112-10, Sec. 3009(a)(2)(B)(i) requires the evaluation to measure the impact of the program on student achievement, and Sec. 3009(a)(3)(A) requires the use of a norm-referenced standardized test. The study administered reading and mathematics tests to students in grades K–12 from the *TerraNova Third Edition*. These tests are vertically aligned and thus able to accurately capture growth in learning as students move from grade to grade (see appendix section B-5 for more information about the test).

⁶ Among the third-year impact sample of treatment group students, about half (49 percent) used the scholarship consistently across all three years, while others used it only in some years (29 percent) or not at all (22 percent) (appendix figure A-5). Three years after applying, 62 percent were using their scholarship.

⁷ The study used a straightforward adjustment procedure attributed to Bloom (1984), which involved dividing the intent-to-treat impact by the proportion of students who used scholarships (see appendix section B-3 for more information).

⁸ The analysis in this report was based on the 69 percent of students who completed tests in reading and the 68 percent who completed tests in mathematics, the 63 percent of students who completed the student survey, and the 70 percent of parents who completed the parent survey during the third year of followup data collection (see appendix B-5). These response rates were typical for studies that test students and survey parents over a number of years. However, to estimate impacts for the program overall and not just for those who provided data in the third year, the study constructed nonresponse weights. These weights align the characteristics of responding students and parents to the characteristics of all students and parents at the time of application and are used for the impact analyses (see appendix B-7).

⁹ Schools were categorized as “in need of improvement” by DC’s Office of State Superintendent for Education as part of the existing accountability provisions under federal law.

2. Impacts on Key Outcomes

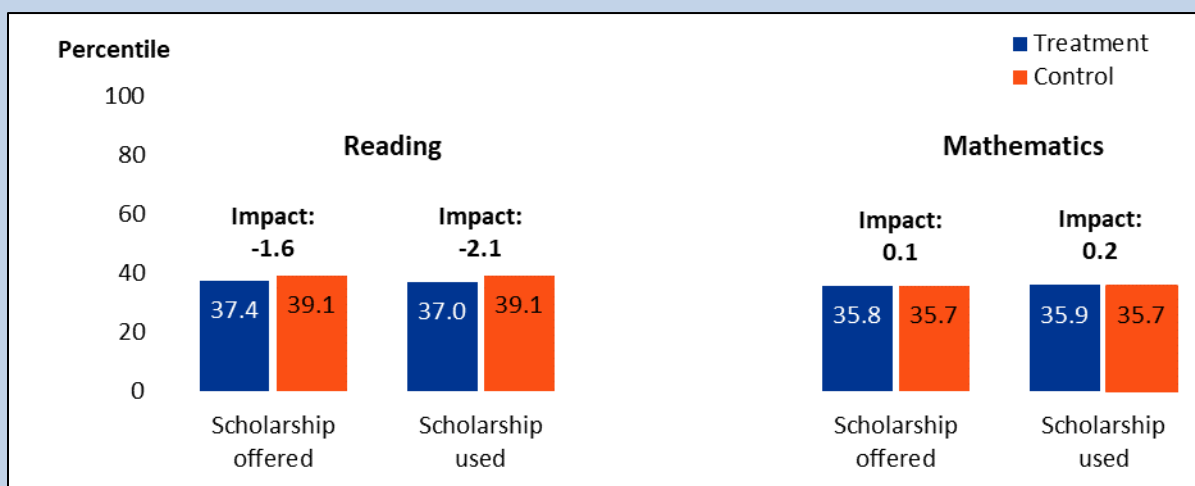
Impacts on Reading and Mathematics Achievement

Improving academic achievement is a clearly stated goal of the SOAR Act. The legislation noted that public school students in DC perform well below national averages on reading and mathematics tests, and gave priority in the OSP to serving students who attend schools in need of academic improvement.

Average test scores for the treatment and control groups are presented in this report as percentiles, a more understandable metric than the scale scores used in impact analyses.¹⁰

There were no statistically significant impacts on either reading or mathematics achievement three years after students applied to the program. Students in the group that received a scholarship offer scored 0.1 percentile points higher on the mathematics test, and 1.6 percentile points lower on the reading test, than students in the control group (figure 2) after three years. Students using a scholarship scored 0.2 percentile points higher on the mathematics test, and 2.1 percentile points lower on the reading test, than students in the control group. None of the differences were statistically significant.

Figure 2. Impacts on reading and mathematics achievement (percentile scores) for scholarship offer and use, in third year



NOTE: Sample size was 571 treatment group students and 366 control group students for reading, and 569 treatment group students and 365 control group students for mathematics.

SOURCE: Estimated means and impacts were generated from the study's regression models, as described in appendix section B-3. Percentiles were calculated using grade-level norms and scale scores. The study administered the *TerraNova Third Edition* reading and mathematics tests to students participating in the OSP evaluation, three years after application.

¹⁰ For example, a student scoring at the 34th percentile performed better than 33 percent of students taking the test nationally, which is more meaningful than reporting an average scale score of 598. The study's models estimated impacts using scale scores. Appendix section B-4 provides detail on how percentiles were computed.

There were no statistically significant impacts on either reading or mathematics achievement for students in any of the study’s eight subgroups. In each case, those offered or using a scholarship had test scores that were similar to those not offered a scholarship (appendix tables C-1 and C-2). This included (1) students attending schools in need of improvement when they applied to the OSP and students not attending schools in need of improvement, (2) students entering elementary and secondary grades when they applied, (3) students scoring above or below the median¹¹ in reading at the time of application, and (4) students scoring above or below the median in mathematics at the time of application.

Impacts on Chronic Absenteeism

Although absenteeism is not an outcome Congress asked the evaluation to examine, it is closely related to ones that were—achievement and high school completion. Students chronically absent during the early elementary years are less likely to be proficient in mathematics and reading by third grade and students chronically absent in the later grades are at risk for dropping out of school before graduation (Mac Iver & Mac Iver, 2010; Gottfried, 2011; Gottfried & Kirksey, 2017; Roby, 2004). Increasingly, states are using rates of chronic absenteeism as a measure of school quality under the Every Student Succeeds Act. Chronic absenteeism commonly is defined as a student being absent for 10 percent or more of the school year, about one month of school (Bauer et al., 2018).

The study collected student attendance data from private schools and the DC Office of the State School Superintendent (OSSE).¹² The number of days absent was converted to the percentage of the school year absent by dividing by the number of days in the school year.¹³

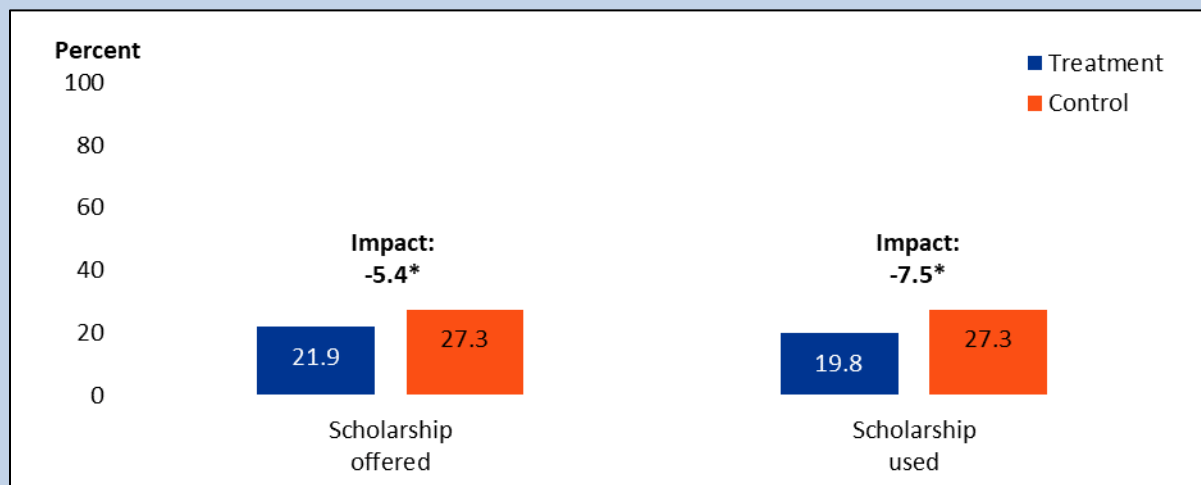
Students who were offered or used an OSP scholarship were less likely to be chronically absent three years after applying to the program. Students in the group that received a scholarship offer had a rate of chronic absenteeism that was 5.4 percentage points lower than the group not offered a scholarship (21.9 percent compared to 27.3 percent) (figure 3). Students using a scholarship had a rate of chronic absenteeism that was 7.5 percentage points lower than the control group. The differences were statistically significant.

The OSP’s impacts on absenteeism were significant for students who were older and initially lower performing. Among students in grades 6–12 when they applied to the program, those offered scholarships had chronic absence rates 15.2 percentage points lower than students in the control group. For students with reading scores below the median when they applied, chronic absence rates were 10.1 percentage points lower for students offered scholarships. Differences for the other six subgroups were not statistically significant (appendix table C-3).

¹¹ Defined in relation to the median performance of study participants at the time of application.

¹² Due to availability of data, absenteeism was examined for this final impact report only. The study defined students as absent if they were absent the entire day, regardless of whether the absence was excused or unexcused. It is important to note that there were likely differences both across sectors (public vs. private) and even within sectors (among private schools or among public schools) in attendance policies and how consistently they were applied.

¹³ The denominator was the number of days in the school year of the specific school a student attended at the time of testing. The study also measured impacts on the percentage of school days absent, which are reported in appendix section D-6.

Figure 3. Impacts on student chronic absenteeism for scholarship offer and use, in third year

*Difference between the treatment group and the control group was statistically significant at the 0.05 level.

NOTE: Sample size was 585 treatment group students and 460 control group students.

SOURCE: Estimated means and impacts were generated from the study's regression models, as described in appendix section B-3. Student attendance data from the Office of State Superintendent for Education and private schools for school years 2014–15, 2015–16, and 2016–17.

Impacts on Parent and Student Satisfaction

The OSP legislation called for the study to look at parent and student satisfaction with the child's school. Recent research suggests that parents are more satisfied if they choose their child's school (Barrows et al., 2017; Grady & Bielick, 2010). That research also indicates high levels of parent satisfaction regardless of school type, though there is some evidence that parents with children in private schools report the greatest satisfaction. This study compared satisfaction levels of parents and students in the treatment group with those in the control group, where a majority of families in both groups have exercised school choice. In DC, families have the option of applying through a common lottery to attend public schools other than their assigned neighborhood school. Three years after applying to the program, the percentage of students attending a charter school, private school, or traditional public school other than their assigned neighborhood school was 91 percent for the treatment group and 78 percent for the control group.

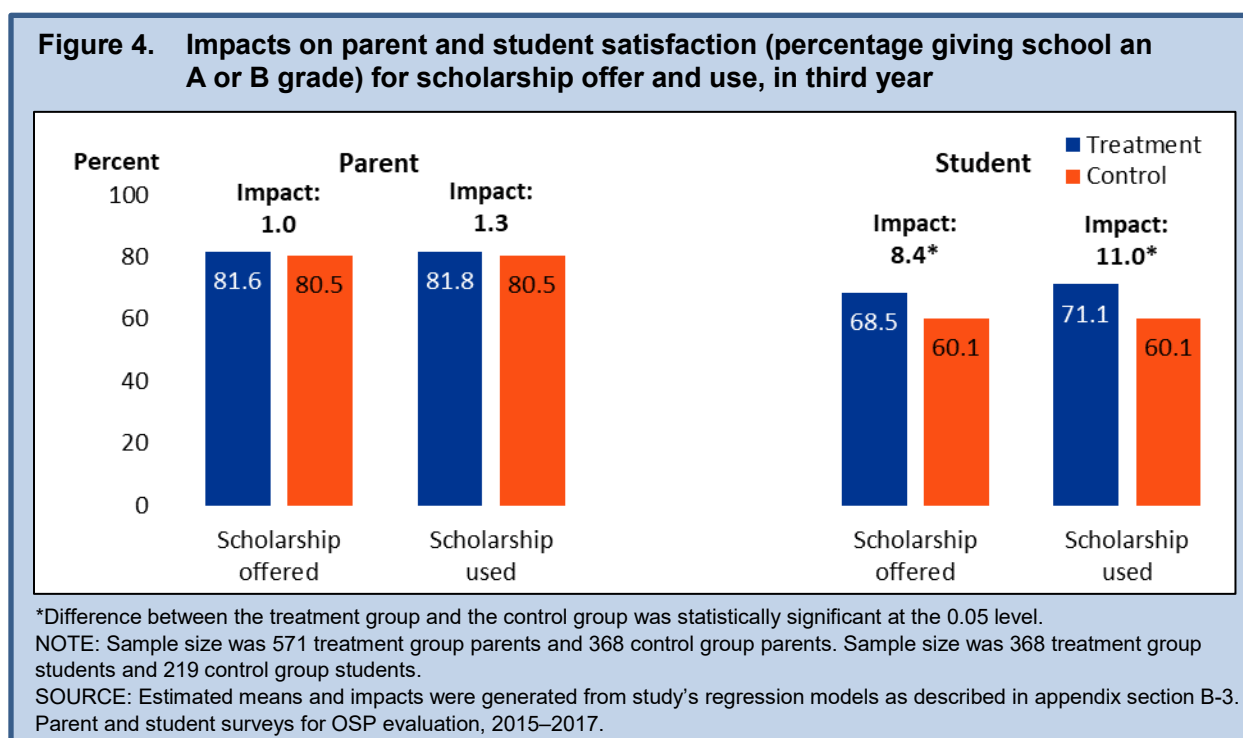
The study administered surveys annually to parents and students in grades 4–12 to gauge satisfaction with the school that students were attending. For the primary measure of satisfaction, parents and students were asked to grade the school using a range from A to F. For this analysis, parent and student responses that gave the school a grade of A or B were grouped into one category and all other responses were grouped into the other category.

The program had no statistically significant impact on parents' satisfaction with their child's school, but had a positive impact on students' satisfaction three years after they applied to the program. The proportion of parents giving their child's school an A or B was similar for parents of students offered the scholarship (81.6 percent) and parents of students not offered (80.5 percent)

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(figure 4).¹⁴ Scholarship use also had no statistically significant impact on parent satisfaction. However, students’ satisfaction was 8.4 percentage points higher, with 68.5 percent of students offered the scholarship giving their school an A or B compared with 60.1 percent of students not offered the scholarship; the difference was statistically significant. The positive impact of scholarship use on students’ satisfaction was 11.0 percentage points. Appendix section D-2 provides additional information for interpreting the student survey results, which had relatively low response rates.

There was little evidence that the program improved school satisfaction for individual subgroups of parents or students. There were no statistically significant impacts on school satisfaction for any subgroup of parents (appendix table C-4). For student satisfaction, there was a statistically significant impact for only one subgroup, students with reading scores above the median. For each of the remaining seven subgroups, findings were not statistically significant (appendix table C-5).



Impacts on Parent and Student Perceptions of School Safety

The OSP legislation indicated that one purpose of the program was to address shortfalls in DC’s public-school safety, and it called for the study to look at parent and student perceptions of school safety. The annual parent and student surveys included a question asking parents and students to rate the school as “very safe,” “somewhat safe,” or “not safe.” In this analysis, parent and student responses rating the school as “very safe” were compared with the other two response categories.

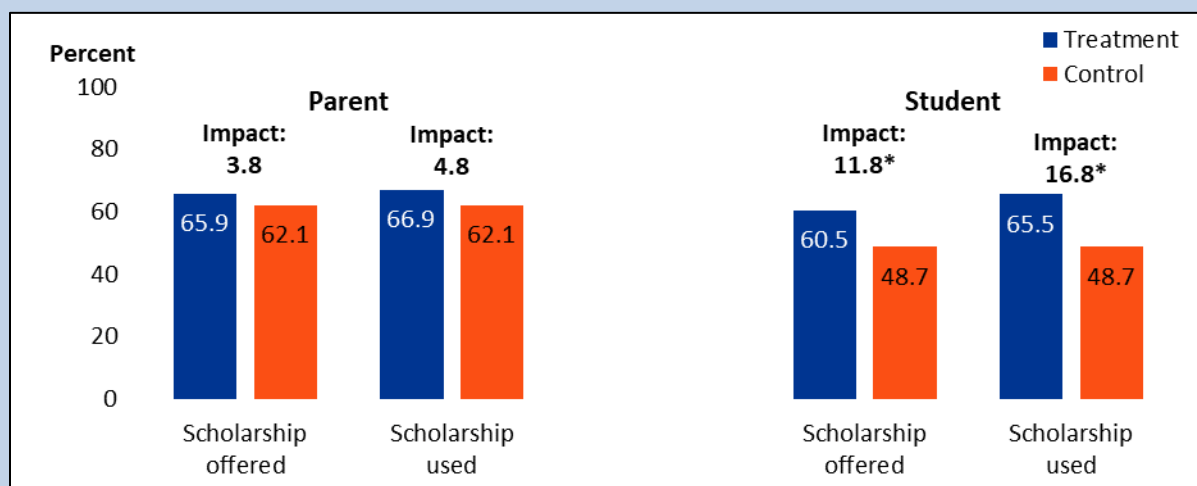
¹⁴ The study’s primary measure of satisfaction assessed parent’s general or overall satisfaction with their child’s school, in line with the focus on general satisfaction implied by the SOAR Act’s language. However, parents also responded to a question about satisfaction with 16 aspects of their child’s school (for example, academic quality and class sizes). Parents of students in the treatment group were more satisfied than parents of students in the control group with 10 of the 16 aspects. Appendix table D-9 presents the full set of these secondary parent satisfaction items.

The program had no statistically significant impact on parents’ perceptions of school safety, but had a positive impact on students’ perceptions three years after they applied to the program.

The proportion of parents indicating their child’s school was “very safe” was 65.9 percent for those offered scholarships and 62.1 percent for those not offered scholarships (figure 5). Scholarship use also had no statistically significant impact on parents’ perceptions of school safety. The proportion of students indicating their school was very safe was 60.5 percent for those offered scholarships and 48.7 percent for those not offered scholarships, a nearly 12 percentage point difference that was statistically significant.¹⁵ The positive impact of scholarship use on students’ perceptions of school safety was 16.8 percentage points.

The impacts on perceptions of school safety for the subgroups were similar to the impacts for parents and students overall. There was a statistically significant positive impact on parent perceptions of school safety for only one of the eight subgroups: parents of students who were above average in mathematics at the time of application (appendix table C-6). For four subgroups of students—those attending schools in need of improvement, entering a secondary grade, below average in reading, and below average in mathematics at the time of application—the program had statistically significant positive impacts on their perceptions of school safety. Findings were not statistically significant for the remaining four student subgroups (appendix table C-7).

Figure 5. Impacts on parent and student perceptions of school safety (percentage rating school as very safe) for scholarship offer and use, in third year



*Difference between the treatment group and the control group was statistically significant at the 0.05 level.

NOTE: Sample size was 504 treatment group parents and 360 control group parents. Sample size was 364 treatment group students and 220 control group students.

SOURCE: Estimated means and impacts were generated from study’s regression models, as described in appendix section B-3. Parent and student surveys for OSP evaluation, 2015–2017.

¹⁵ In addition to overall ratings of school safety, students responded to secondary questions about the frequency of eight specific safety-related incidents at school. Students in the control group were more likely to report being threatened with physical harm at school or being bullied at school (appendix table D-10 presents the full set of survey items).

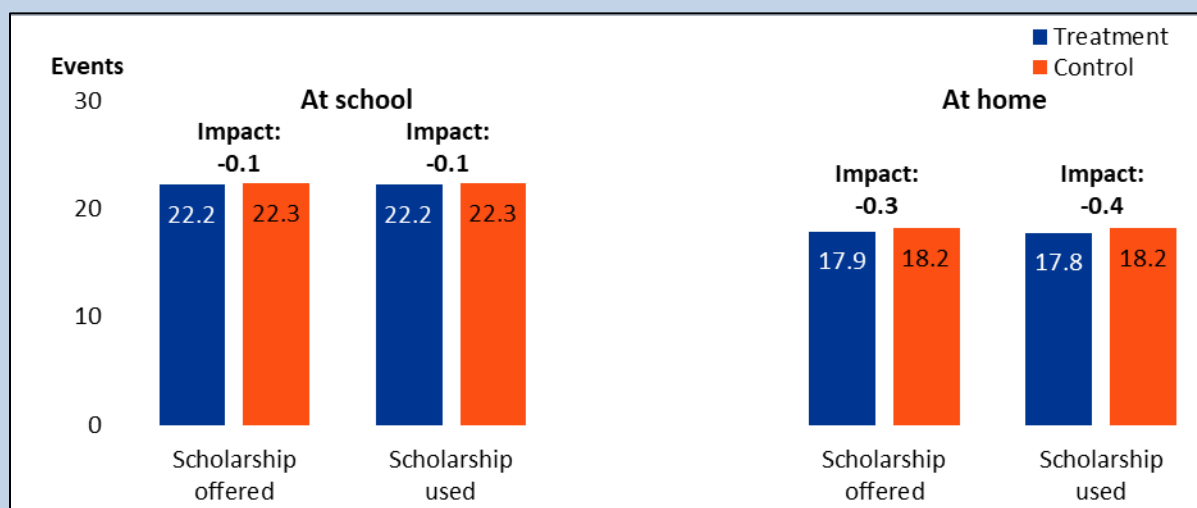
Impacts on Parent Involvement in Education

The SOAR Act called for the study to look at the program’s impacts on parent involvement in education, which has been linked to better academic achievement and fewer behavioral problems for students (Jeynes, 2005; El Nokali, Bachman, & Votruba-Drzal, 2010). Parent survey items measured involvement with education at school and in the home.¹⁶ Parents reported how often during the school year they engaged in activities such as communicating with teachers, or attending school activities or meetings. Parents also reported how often during the past month they did education-related activities with their child at home such as helping with homework or talking about experiences in school.

Overall, the program had no impact on parent involvement in education at school or at home three years after applying to the program. The number of school involvement events was 22.2 for the treatment group and 22.3 for the control group (figure 6). The number of education-related events at home was 17.9 for the treatment group and 18.2 for the control group. Differences were not statistically significant for parents of students offered the scholarship or students using the scholarship.

In general, there were few impacts on parent involvement for the study’s subgroups. However, for one subgroup—parents of students who were in elementary grades when they applied to the program—there were statistically significant negative impacts on their involvement in education at both their child’s school and in the home (appendix tables C-8 and C-9). Also, for parents of students who were in secondary grades when they applied to the program, there was a statistically significant positive impact on their involvement at school (appendix table C-8).

Figure 6. Impacts on parent involvement in education at school and at home (number of events reported) for scholarship offer and use, in third year



NOTE: Sample size for school involvement was 474 treatment group parents and 345 control group parents. Sample size for home involvement was 506 treatment group parents and 361 control group parents.

SOURCE: Estimated means and impacts were generated from study’s regression models, as described in appendix section B-3. Parent surveys for OSP evaluation, 2015–2017.

¹⁶See appendix section D-8 for more information about the parent survey items.

Limitations

The study faced challenges in obtaining high rates of response for the testing requirement and for the student survey three years after students applied to the OSP, a common problem for evaluations that follow individuals over time. However, analyses included in the appendix, taken together with the study's methods for estimating impacts, provide confidence in the findings reported above. First, sections D-1 and D-2 of the appendix show that the background characteristics of students who provided data for the current report mirrored the full sample of students the study attempted to survey and test. Response rates differed for students offered and not offered scholarships, which would be particularly problematic if achievement at the time of application—a strong predictor of later achievement—was related to whether or not students were tested. For example, if students with lower achievement at the time of application were less likely to respond and fewer control group students responded, this would create a “biased” sample of higher performing control group students. However, students' achievement scores when they applied to the program were not related to whether or not they completed testing (appendix section D-1).¹⁷

3. Change in Achievement Impacts Over Time

Combined with findings from the evaluation's previous two reports (Dynarski et al., 2017; Dynarski et al., 2018), the findings here provide information about the OSP's impacts over the three years since students applied to the program. The program had no effect on reading achievement in any of these years. However, for mathematics, negative impacts reported in the first two years were not found in the third year.¹⁸ Understanding what might have contributed to the change in mathematics impacts between students' second and third years, a finding that has been noted elsewhere (e.g., Mills & Wolf 2017b), is the focus of the questions and exploratory analyses below. Because the focus is on examining change over time, each analysis uses the group of students who completed testing each and every year it was carried out.

Did faster growth for the treatment group or slower growth for the control group result in the two groups performing similarly by year three?

The treatment and control groups were performing similarly by year three, when a year earlier the control group had been doing better. Distinguishing if this change was due to the control group losing or the treatment group gaining ground is important if the goal is to understand how voucher programs work. For example, some research suggests that students who move from public to private schools can initially struggle with the new environment, but may experience achievement gains in later years that allow them to catch up with their peers (Mills & Wolf, 2017a). This theory would be supported by finding that the treatment group's achievement improved substantially—and more than the control group's—between the

¹⁷ As discussed in the appendix (section D-1), the study did find that students in the treatment group were less likely than students in the control group to be located in a DC school in the third year. However, followup analyses did not find a relationship between students potentially moving out of DC or dropping out of school, and achievement at the time of application. This, along with additional analyses reported in the appendix, suggest that the difference between the treatment and control group in terms of moving, should not have shaped the mathematics and reading achievement findings reported in chapter 2.

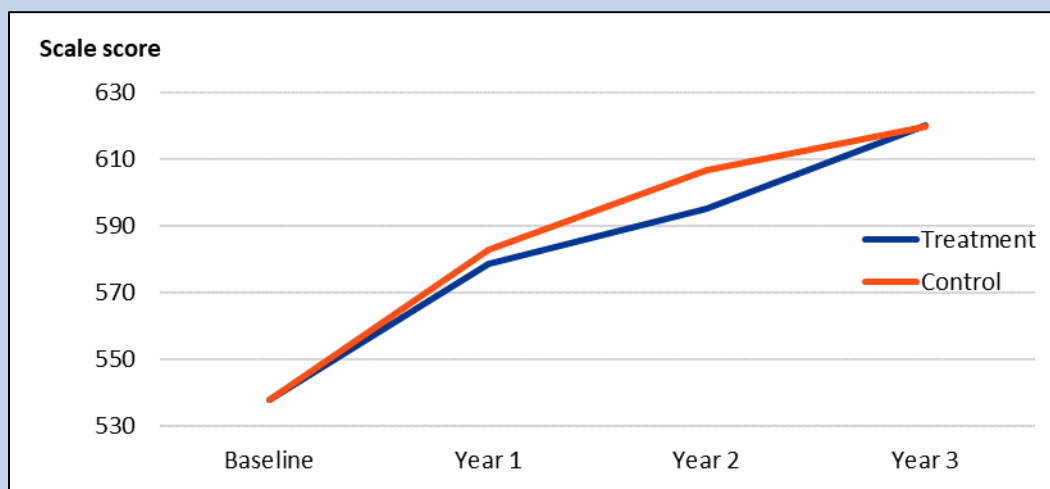
¹⁸ The variation in impacts across years, as well as the change in impacts on mathematics achievement between the second and third years, was statistically significant (see appendix section D-3).

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second and third years. Alternatively, the similar academic performance of treatment and control group students in the third year may have had nothing to do with students offered vouchers and be more about declines in mathematics test scores among students in the control group.

Students in the treatment group caught up to their peers in the control group through a combination of faster growth by the treatment group and slower growth by the control group (figure 7). For both groups, average mathematics scores increased between the second and third years, indicating that mathematics achievement benefited from an additional year of schooling. But the growth in mathematics achievement accelerated for the treatment group (i.e., achievement grew by more than it had between the first and second years after OSP application) and decelerated for the control group. Larger increases in average scores for the treatment group than for the control group closed the gap in achievement between the second and third years. This provides some evidence for the hypothesis that students moving to private schools might struggle, experiencing temporary declines in academic performance that dissipate over time. But it also raises questions about what happened to students in the control group, the majority of whom were attending public schools.

Figure 7. Average test scores in mathematics for students in the treatment and control groups, by year



NOTE: Average scale scores were calculated based on the longitudinal sample of 672 students who were tested in mathematics at baseline and all three followup years.

SOURCE: Estimated means were generated from the study's regression models for the impact of the scholarship offer, as described in appendix section B-3. The treatment and control means for each year were regression-adjusted to account for baseline differences, and evaluated at the sample mean across both groups. The study administered the *TerraNova Third Edition*, reading and mathematics tests.

Could the treatment group's increased achievement growth and the resulting lack of achievement impacts in the third year be related to declining use of the scholarship over time?

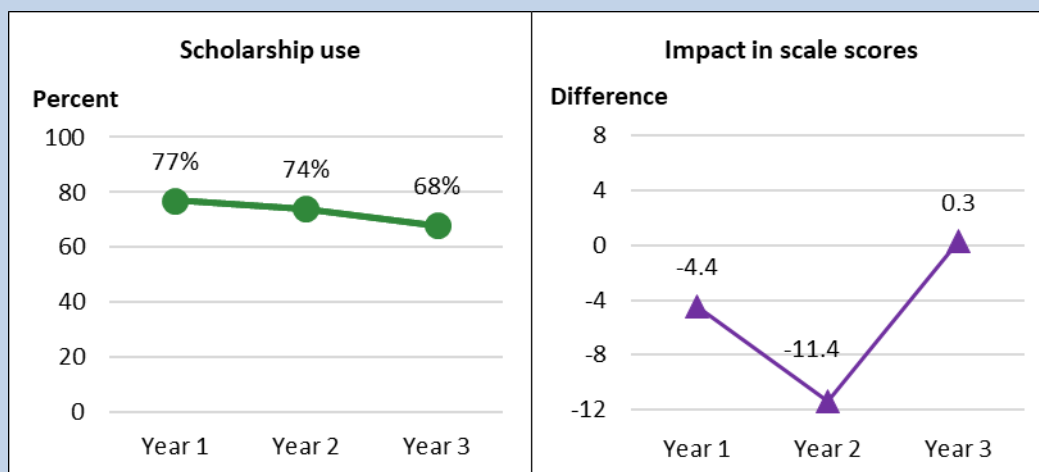
The negative impacts one and two years after application suggest that using a scholarship led to lower mathematics achievement, at least initially. If participating in the OSP decreases mathematics achievement, then impacts could improve if scholarship use dropped significantly in the third year and more students returned to DC public schools. Alternatively, if students who were offered scholarships but did not use them performed worse than those using a scholarship, including these “non-users” when

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calculating treatment group achievement scores may bring down the treatment group average and may have unfairly masked a positive program impact after three years.

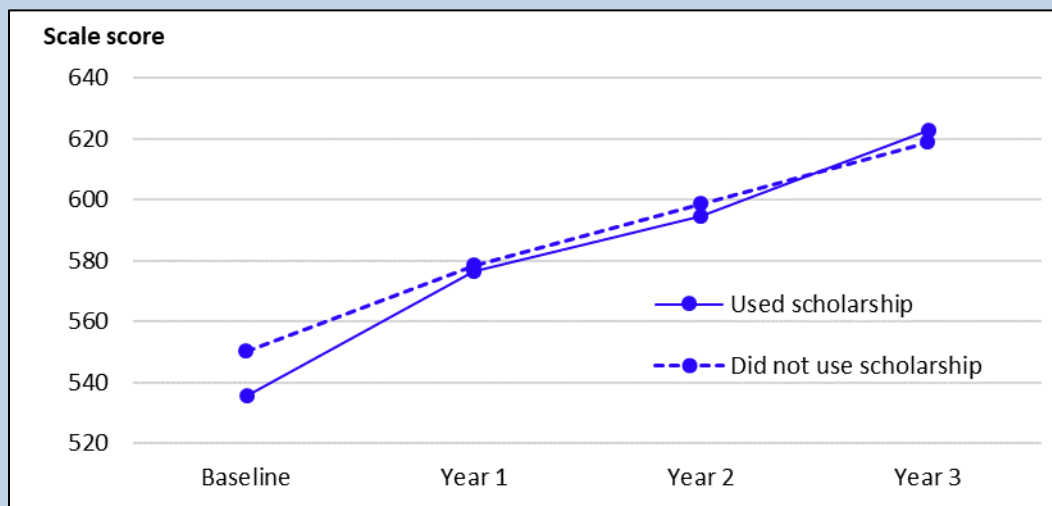
It seems unlikely that improved mathematics achievement for the treatment group between the second and third years and the lack of mathematics impacts in the third year were simply due to fewer students using an OSP scholarship (figure 8). Scholarship use for those in the study sample declined slowly and steadily over the three years, though a substantial share of treatment group students were still using their scholarships in the third year (68 percent). However, mathematics achievement impacts first became more negative and then approached zero by the third year. The difference in patterns suggests that a change in scholarship use probably does not explain the change in program impacts.

Figure 8. Percentage of treatment group students using the scholarship, and mathematics achievement impacts in scale scores, by year



NOTE: Sample size was 423 treatment group students who were tested in mathematics at baseline and all three followup years. SOURCE: Scholarship use rate was calculated from payment files from Serving Our Children. Estimated impacts were generated from the study's regression models for the impact of the scholarship offer, as described in appendix section B-3.

At the same time, there is little evidence that the treatment group would have performed even better if scholarship use rates had been higher. When comparing mathematics achievement for those in the treatment group who used scholarships and those who did not, the difference in scores in each of the three years after applying to the program was not statistically significant (figure 9). This suggests that including non-users in the treatment group average did little to change the study's findings, and non-users were not masking a true positive impact of the program.

Figure 9. Average mathematics test scores for treatment group students, by scholarship use and year

NOTE: Average scale scores were calculated based on the longitudinal sample of 423 treatment group students who were tested in mathematics at baseline and all three followup years (347 who used the scholarship in Year 3, and 76 who did not use the scholarship in Year 3). Baseline scores for the two groups were significantly different at the 0.05 level. Differences for Year 1, Year 2, and Year 3 were not statistically significant.

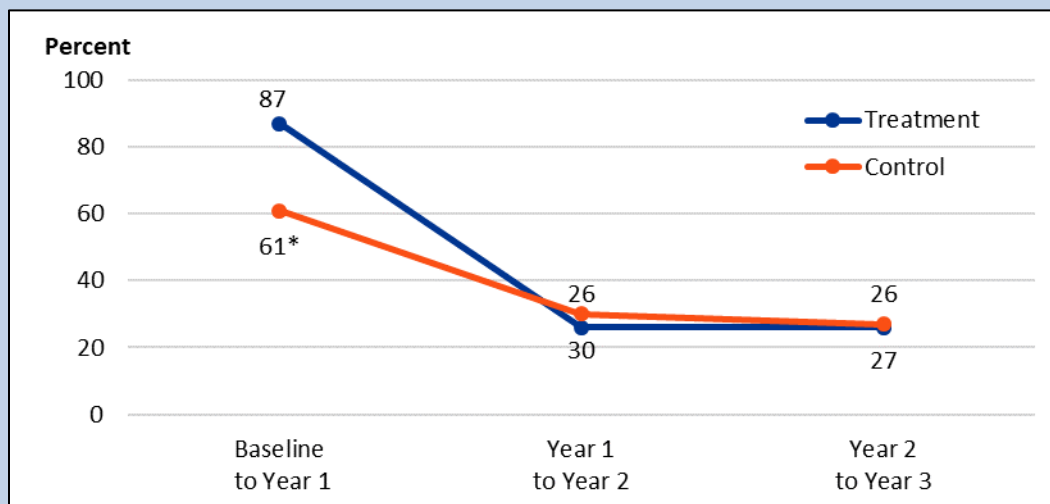
SOURCE: Estimated means were generated from the study's regression models for the impact of the scholarship offer, as described in appendix section B-3. The treatment and control means for each year were regression-adjusted to account for baseline differences, and evaluated at the sample mean across both groups. The study administered the *TerraNova Third Edition* mathematics test to students participating in the OSP evaluation.

Could the control group's slowing achievement growth and the resulting lack of impacts in the third year be due to the frequency of their changing schools in the study's later years?

The hypothesis that public schools produce smaller learning gains than private schools does not explain why the control group's mathematics achievement grew *faster* in the first two years than between the second and third years. One question is whether or not changing schools, which some hypothesize disrupts achievement (Schwartz et al., 2017), might contribute to the control group's slowing growth. Specifically, it seems possible that control group students would be changing schools more than treatment group students two years after applying to the OSP, and still searching for suitable schools since they had not been offered scholarships or the opportunity to attend a private school. If so, additional mobility after two years might slow mathematics achievement gains.

There is little evidence that school changes are a factor in the slowing mathematics achievement gains of the control group. Among the control group, mobility rates were comparable two and three years after students applied for scholarships. These rates were also quite similar to those among the treatment group (figure 10).¹⁹ This suggests that school mobility probably did not contribute to the trend in mathematics achievement impacts.

¹⁹ The study also examined the number of times students changed schools over the three years to see whether there were differences between the two groups. Control group students were less likely to change schools more than once (29 percent) compared with students in the treatment group (36 percent) (see appendix section D-5).

Figure 10. Percentage of students in the treatment and control groups who changed schools, by year

*The difference between the percentage of treatment and control groups changing schools between baseline to Year 1 was significant ($p < .0001$).

NOTE: Sample size was 423 treatment group students and 247 control group students in the longitudinal sample who were tested at baseline and all three followup years.

Could the change in mathematics impacts be due to the differences in how many students and which students participated in testing each year?

Finally, it is important to make sure that the trends in mathematics impacts are valid and do not stem from some aspect of how the study was carried out. As discussed earlier, not all students participated in the study's testing each year. It is possible that differences in which students participated each year might contribute to the change in mathematics impacts.

It is unlikely that the shift in mathematics impacts between the second and third years was a consequence of differences in who was tested over time. Analyzing mathematics impacts one, two, and three years after OSP application for the set of students who participated in testing in all three years shows the same pattern of results as for all students in the study sample: negative mathematics impacts after one and two years and no impacts after three years (appendix D-3).

4. Implications of This Final Report's Results

Three years after students applied to the OSP, those offered scholarships were doing no better academically but also no worse than otherwise similar peers not given the same opportunity. While it was important to explore potential reasons that impacts found in the study's earlier years had changed over time, it was also important to put the final report's lack of achievement impacts into context and consider future directions for the program and continuing assessments of it.

The current OSP's impacts on achievement are consistent with those of other recently studied voucher programs, and suggest that following students beyond three and four years may be important. Recent studies of state voucher programs in Louisiana, Indiana, and Ohio (Abdulkadiroglu,

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Pathak, & Walters, 2016; Mills & Wolf, 2017b; Waddington & Berends, 2017; Figlio & Karbownik, 2016) all indicate that students offered or using vouchers tend to score worse on mathematics tests after one and two years, when compared to similar peers not using vouchers. The effects on reading achievement have been mixed with some, but not all, studies finding negative impacts. Importantly, a few of these studies have found that the negative achievement impacts lessen over time, so that students offered or still using vouchers after three and four years no longer perform worse than similar peers (Mills & Wolf, 2017b; Waddington & Berends, 2017).

The current evaluation of the OSP and these other voucher studies all raise questions about what happens five, six, seven, and more years after students are offered vouchers. For programs with negative impacts even after three years, might that change in later years? For programs like the OSP, might positive impacts eventually emerge? The recent 2017 reauthorization of the SOAR Act mandated that the current evaluation discontinue its work and that the U.S. Department of Education begin a new study, with a different methodology.²⁰ Therefore questions about the longer-term impacts of participating in the OSP on academic achievement will remain unanswered. Fortunately, the law includes a new requirement to use the current evaluation sample to evaluate the impacts of the OSP on college enrollment and attainment. This analysis, expected in 2026, will be an important indicator of the program's long-term effectiveness.

It seems possible that the OSP's lack of effectiveness might be related to DC families' already-widespread access to school choice. This study examined the impact of being offered a private school voucher in a context where families already have the option to apply to a large number of both charter and traditional public schools other than their assigned neighborhood schools. An earlier report from this evaluation showed that parents of most students in both the treatment and the control groups had chosen a school other than their child's assigned neighborhood school. That report demonstrated that choosing schools was associated with parent satisfaction with schools and hypothesized that choice might be a reason that most parents in the study—treatment and control group alike—were satisfied (Dynarski et al., 2018). Likewise, it is possible that there were no achievement impacts because students in the control group were able to select schools meeting their academic needs, even if they were not participating private schools.

Public school choice is expanding nationwide, beyond DC. For example, between the 2009–10 and 2015–16 school years, the number of magnet schools increased by almost 50 percent and the number of charter schools grew by more than a third (U.S. Department of Education, 2017). Future studies of voucher programs may find that effectiveness varies depending on the other options available to students eligible for the programs.

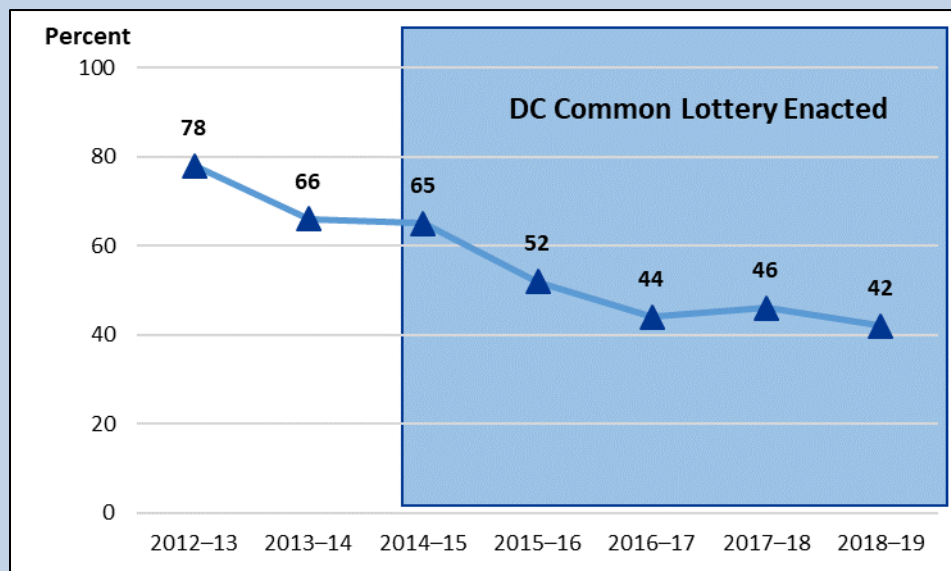
Finally, there are signals that the program might be improved. Based on data collected and validated by the evaluation, from 2012 to 2014 the percentage of students offered scholarships who chose

²⁰ See <https://www.congress.gov/115/plaws/publ31/PLAW-115publ31.pdf> for the SOAR reauthorization Act (P.L. 115-31, sec. 908). The law specifies that a new evaluation be conducted using an acceptable quasi-experimental research design for determining the program's effectiveness that does not use a control group of students who applied for but did not receive scholarships.

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to use them to attend a private school the following year steadily decreased.²¹ According to records from the program operator, this trend has continued (figure 11).

Figure 11. Percentage of students eligible for and offered DC OSP scholarships using a voucher to attend private school one year later



SOURCE: For 2012-13, 2013-14, and 2014-15 scholarship use rate was calculated from payment files obtained from Serving Our Children. For later years, Serving Our Children provided use rates directly.

Additionally, after using a scholarship for one year, many students discontinue use and enroll in a public school.²² Exercising choice includes being able to decide whether and when to enter and leave a selected school. However, the declining rates of initial and continuing scholarship use could be signaling a problem with the set of private schools available to families or the supports the families receive as they apply and adjust to schools. Alternatively, the simplified process for applying to DC charter and non-neighborhood public schools might contribute to declining use.²³ These issues will be explored in a study of the OSP's implementation that will begin in 2019.

²¹ These were the years when the program operator used lotteries to offer scholarships to newly eligible applicants who became part of the evaluation sample.

²² Twenty percent of students who used their scholarship in the first year discontinued scholarship use in the second year.

²³ The first year of the DC common lottery—which allows families to apply to any participating public school using one online application—took place in 2014, with students matched for the 2014-15 school year. Each year since, the number of participating schools has grown.

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