

RESEARCH REPORT

The Effects of Means-Tested Private School Choice Programs on College Enrollment and Graduation

Matthew M. Chingos
URBAN INSTITUTE

Daniel Kuehn
URBAN INSTITUTE

Tomas Monarrez
URBAN INSTITUTE

Patrick J. Wolf
UNIVERSITY OF ARKANSAS

John F. Witte
UNIVERSITY OF
WISCONSIN-MADISON

Brian Kisida
UNIVERSITY OF MISSOURI

July 2019



ABOUT THE URBAN INSTITUTE

The nonprofit Urban Institute is a leading research organization dedicated to developing evidence-based insights that improve people's lives and strengthen communities. For 50 years, Urban has been the trusted source for rigorous analysis of complex social and economic issues; strategic advice to policymakers, philanthropists, and practitioners; and new, promising ideas that expand opportunities for all. Our work inspires effective decisions that advance fairness and enhance the well-being of people and places.

Contents

Acknowledgments	iv
The Effects of Private School Choice Programs	1
Florida Tax Credit Scholarship	3
Data and Methods	4
Results	5
Milwaukee Voucher Program	10
Data and Methods	11
Results	11
Washington, DC, Voucher Program	17
Data and Methods	17
Results	18
Conclusion	21
Appendix Tables	23
Milwaukee	23
Washington, DC	28
Notes	30
References	32
About the Authors	35
Statement of Independence	36

Acknowledgments

This report was funded by the Bill and Susan Oberndorf Foundation, the Walton Family Foundation, the Robertson Foundation, Kate and Bill Duhamel, the Foundation for Excellence in Education, and the Charles and Helen Schwab Foundation. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at urban.org/fundingprinciples.

The Effects of Private School Choice Programs

State and local governments are increasingly allowing public funds to be used to cover private school tuition through such programs as vouchers, tax credit scholarships, and education savings accounts. Participation in these programs has increased rapidly, from less than 150,000 in 2004 to more than 450,000 in 2019 (EdChoice 2019). Private school choice programs are generally targeted to students based on family income or special educational needs (EdChoice 2019).

Research on private school choice has often focused on measuring the impact of attending a private school on students' test scores, relative to attending a public school. Until recently, this research showed neutral to positive effects of private school choice on student achievement (Egalite and Wolf 2016; Shakeel, Anderson, and Wolf 2016). But recent studies have found negative effects of participating in private school choice programs in Indiana, Louisiana, and Ohio (Figlio and Karbownik 2016; Waddington and Berends 2017; Wolf et al. 2019), although these negative effects tend to dissipate over time.

Test scores are an important measure of learning, but they may miss important impacts, both positive and negative, that schools have on student development. Test scores may overstate the benefits associated with attending a school that focuses on teaching to the test at the expense of important student outcomes not measured by standardized tests. The opposite may also be true. Some schools may have positive impacts that are not adequately captured by standardized test performance. And test scores often cannot be used to measure policy effects in high schools, which usually do not administer annual tests.

Studies of school choice programs have increasingly included outcomes other than test scores among their primary analyses. These outcomes include student and parent satisfaction (Campbell 2008; Dee 2005; Howell et al. 2006; Kisida and Wolf 2015; Schneider et al. 1997), as well as societal goals, such as racial integration and reductions in achievement gaps for students of color and other historically disadvantaged groups of students (Betts et al. 2006; Bifulco and Ladd 2007; Egalite, Mills, and Wolf 2017; Greene 2005; Neal 2006; Zimmer et al. 2009). Recent work has also considered the impact of transferring to or from an alternative to public school on students' special needs classification (Wolf and Lasserre-Cortez 2018; Wolf, Witte, and Fleming 2012).

Educational attainment—including graduation from high school and enrollment and persistence in college—may be the most consequential outcome for individual students and their surrounding communities over the long term. Students with higher levels of attainment live longer, lead healthier lives, earn more income, and avoid welfare and the criminal justice system at higher rates than their peers with lower levels of attainment (Belfield and Levin 2007; Carneiro, Heckman, and Vytlačil 2003; Day and Newburger 2002; Levitt and Lochner 2001; Lleras-Muney 2005; Meara, Richards, and Cutler 2008; Muennig 2005; Wirt et al. 2004). Most of these studies find positive effects of going to college even for students who do not obtain a degree.

Over the past three years, the Urban Institute has released several studies estimating the effects of three publicly funded private school choice programs on college enrollment and graduation. First, Chingos and Kuehn (2017) and Chingos, Monarrez, and Kuehn (2019) examined the Florida Tax Credit Scholarship program, the nation’s largest program of its kind. Second, Wolf, Witte, and Kisida (2018) studied the Milwaukee Parental Choice Program, the nation’s first modern voucher program. And finally, Chingos (2018) studied Washington, DC’s Opportunity Scholarship Program, the only federally funded voucher program.¹

This report provides the most up-to-date results available for all three programs, including newly updated results for both Milwaukee and Washington, DC. For each city, we provide an overview of the program, summarize the data and methods used (referring readers to the original studies for details), and present the results. We conclude by discussing what lessons can be learned from these studies and what topics are most pressing for future research.

Florida Tax Credit Scholarship

The Florida Tax Credit Scholarship (FTC) program became law in the spring of 2001 and first provided scholarships to low-income students beginning in the 2002–03 school year (Figlio and Hart 2014). It is effectively a means-tested school voucher program, but it is called a tax credit scholarship program because the scholarships are financed by corporate donations that are reimbursed by corporate tax credits.

Donors receive a tax credit worth 100 percent of donations to scholarship funding organizations.² These organizations are state-approved nonprofit organizations that administer the scholarships. There were as many as eight scholarship funding organizations in the early years of the program, but since 2010–11, the program has been administered almost exclusively by the nonprofit Step Up for Students.³

Participation in the FTC program is limited to students from low-income families, initially defined as those eligible for free and reduced-price lunch (i.e., coming from households making less than 185 percent of the federal poverty level). The Florida legislature increased the eligibility cutoff for continuing scholarship participants to 200 percent of the federal poverty level beginning in 2006–07 and to 230 percent beginning in 2010–11 (with partial scholarships awarded to families between 200 and 230 percent). The legislature increased the eligibility cutoff for both new and continuing participants to 260 percent beginning in 2016–17, with partial scholarships for families between 200 and 260 percent.⁴ In both cases, the legislature specified that priority be given to children from families making less than 185 percent of the federal poverty level, as well as those in foster care if the program is oversubscribed.⁵

For most of the program's history, students entering 2nd through 12th grade on an FTC scholarship had to attend a Florida public school for the full year before enrolling in a private school, with students entering kindergarten and 1st grade exempted from the requirement. The exemption was expanded to include students from kindergarten through 5th grade beginning in 2012–13, and the prior public school attendance requirement was eliminated beginning in 2014–15.⁶

The maximum scholarship amount was \$3,500 in the program's early years and has been increased to more than \$6,000 in 2017. The scholarship cannot exceed tuition and fees, and schools are not required to accept the scholarship as full tuition (i.e., schools can require families to cover the difference between the scholarship and tuition). Private schools can continue to use their usual admissions processes to select applicants.

Private schools are required to meet certain standards to enroll students with FTC scholarships, including federal nondiscrimination requirements and state and local health and safety codes. Beginning in 2006–07, participating private schools were also required to administer a norm-referenced test of their choosing (from a state-approved list) to FTC students to assess learning.

Data and Methods

We use comprehensive data on public school students from the Florida Department of Education linked to FTC records from Step Up for Students, the nonprofit that administers the FTC program, and college enrollment and graduation information from the National Student Clearinghouse (NSC). These data are described in detail in Chingos and Kuehn (2017) and Chingos, Monarrez, and Kuehn (2019).

The treatment group of scholarship students consists of those who first took standardized reading and math tests in the Florida public school system and participated in the FTC program the following year (Chingos and Kuehn 2017). For the 2019 update, we include students who were expected to graduate from high school by 2015–16 so that we can observe their college enrollment within two years of expected graduation.

We study the outcomes of 16,111 FTC participants who first took standardized reading and math tests in the Florida public school system and participated in the FTC program the following year. We match each of these 16,111 students to up to five nonparticipating students who were enrolled in the same baseline school, grade, and year and who had similar characteristics, including math and reading scores, language, nativity, race or ethnicity, disability status, age, and free lunch participation. We use the same propensity score matching methodology described in Chingos and Kuehn (2017) and Chingos, Monarrez, and Kuehn (2019).

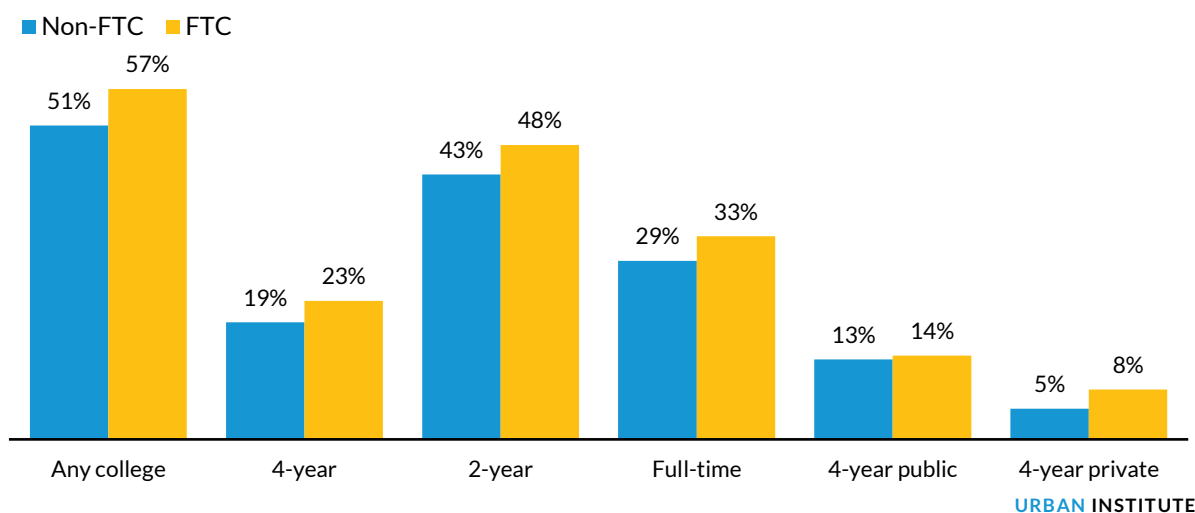
Matching on a rich set of pretreatment characteristics allows us to compare students who are similar in many ways except for FTC participation. But participants and nonparticipants could differ in unmeasured ways, such as parental engagement, family religiosity, or experiences in public school. If these unmeasured characteristics differ, on average, between the treatment and comparison groups and are associated with student outcomes, our results will be biased.

Results

We present our main findings in the figures below, with full results available in Chingos, Monarrez, and Kuehn (2019, appendix tables A.1–A.4). In all our analyses, we estimate separate effects for students entering FTC in elementary and middle school versus high school, as we expect that the effects of attending a private high school may differ from the long-term effects of attending a private elementary or middle school (especially because many of these students go to public high schools). Students who select into private high schools are also likely to differ from students who select into private elementary and middle schools.

Figure 1A shows our results for students who began participating in the FTC program in elementary or middle school. FTC students are 6 percentage points more likely to enroll in college, an increase of 12 percent relative to the comparison group’s 51 percent enrollment rate. This effect includes increased enrollment at both two-year and four-year colleges and reflects an increase in full-time enrollment (i.e., not just part-time enrollment). The effect in the four-year sector is concentrated in private (nonprofit) colleges, where FTC students were 3 percentage points more likely to enroll, an increase of 62 percent compared with the 5 percent of their non-FTC peers who enrolled in this sector.

FIGURE 1A
Effects of FTC Participation on College Enrollment within Two Years of Expected High School Graduation, Baseline Grades 3–7

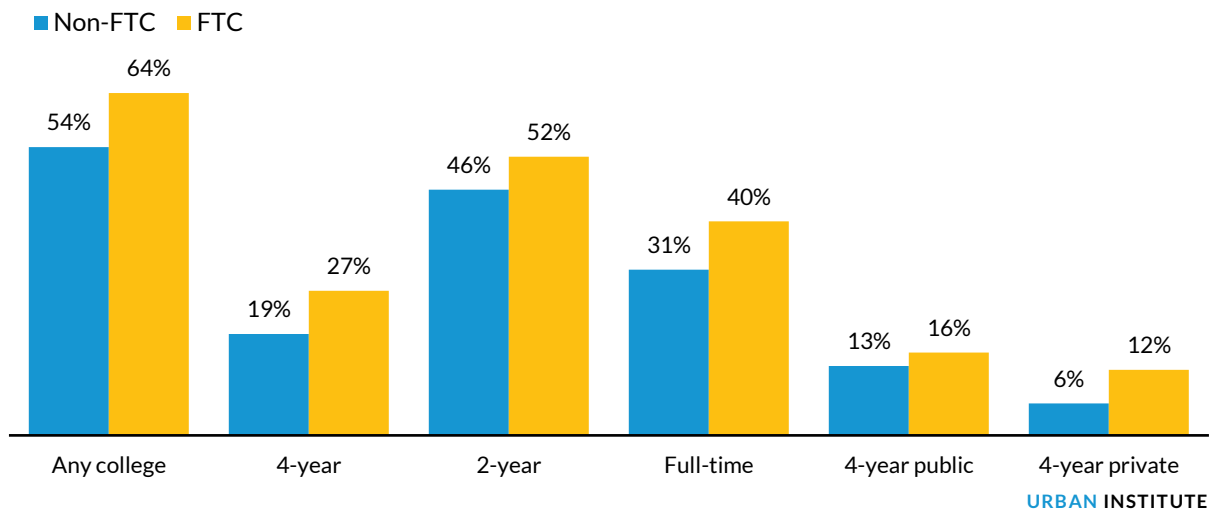


Source: Authors’ calculations from Step Up for Students program data, Florida Education Data Warehouse data, and National Student Clearinghouse data.

Notes: FTC = Florida Tax Credit. All FTC effects are statistically significant at $p < 0.05$.

We find larger effects across the board for students who first participated in FTC in high school. Figure 1B shows that these students were 10 percentage points more likely to enroll in college, a 19 percent increase compared with the 54 percent enrollment rate of their non-FTC peers. This effect was shared between two- and four-year colleges, with especially noteworthy effects at four-year private nonprofit colleges, where the FTC enrollment rate was double that of the comparison group.

FIGURE 1B
Effects of FTC Participation on College Enrollment within Two Years of Expected High School Graduation, Baseline Grades 8–10



Source: Authors’ calculations from Step Up for Students program data, Florida Education Data Warehouse data, and National Student Clearinghouse data.

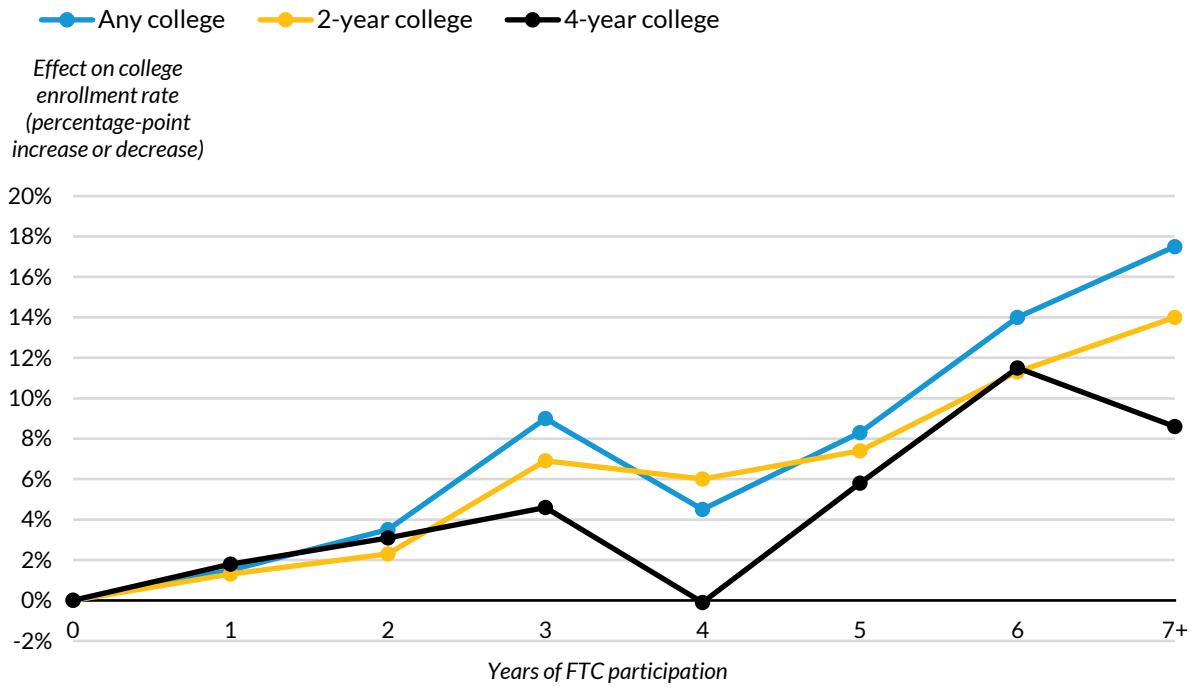
Notes: FTC = Florida Tax Credit. All FTC effects are statistically significant at $p < 0.05$.

Figures 2A and 2B shows results by the number of years students participated in FTC. These results should be interpreted with caution, as we expect students who persisted in the program might differ in unmeasured ways from those who left.⁷ But the results suggest the possibility of small or null effects from a single year of participation, with larger effects for students who participated longer.

This finding holds for enrollment at both two- and four-year colleges, with larger effects for students who entered FTC in high school. For example, students who spend all four years in a private high school (18 percent of participants in these grades) see their enrollment rate at four-year colleges double compared with the comparison group.

FIGURE 2A

FTC Effects by Years of Participation, Baseline Grades 3–7



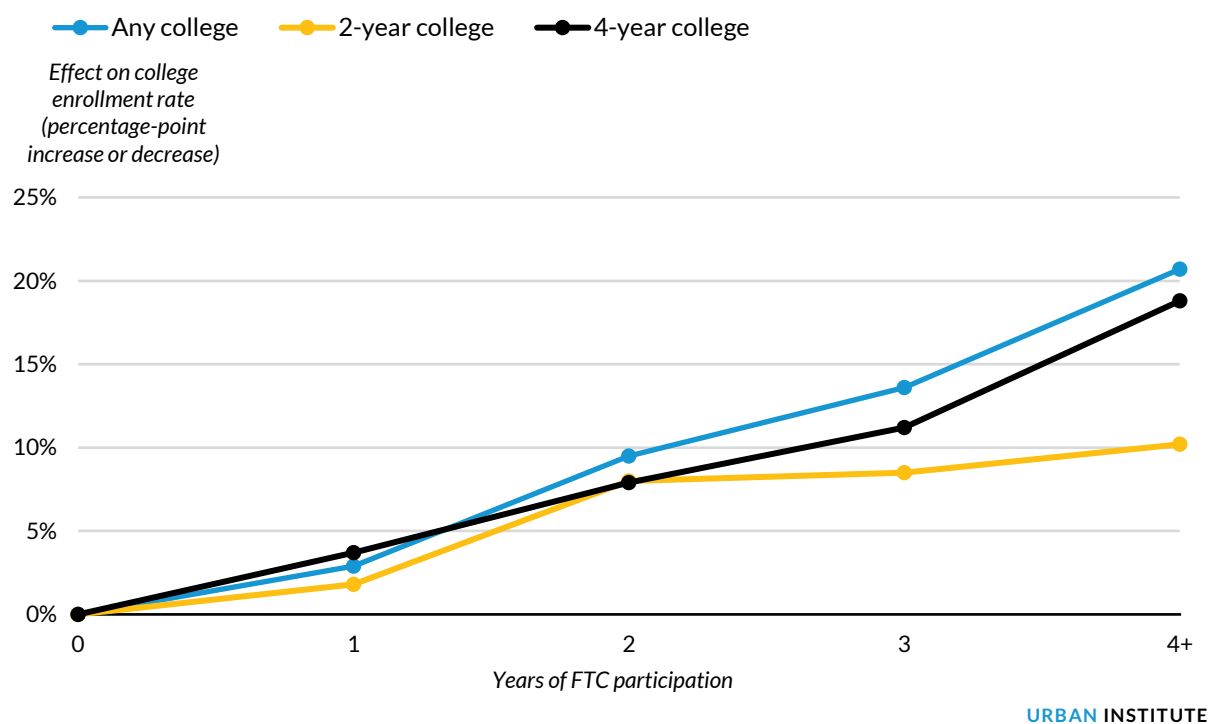
URBAN INSTITUTE

Source: Authors' calculations from Step Up for Students program data, Florida Education Data Warehouse data, and National Student Clearinghouse data.

Notes: FTC = Florida Tax Credit. All FTC effects are statistically significant at $p < 0.05$, except for the effects on any and two-year college enrollment after one year of FTC participation and the effect on four-year college enrollment after four years of participation.

FIGURE 2B

FTC Effects by Years of Participation, Baseline Grades 8–10



Source: Authors’ calculations from Step Up for Students program data, Florida Education Data Warehouse data, and National Student Clearinghouse data.

Notes: FTC = Florida Tax Credit. All FTC effects are statistically significant at $p < 0.05$, except for the effect on two-year college enrollment after one year of FTC participation.

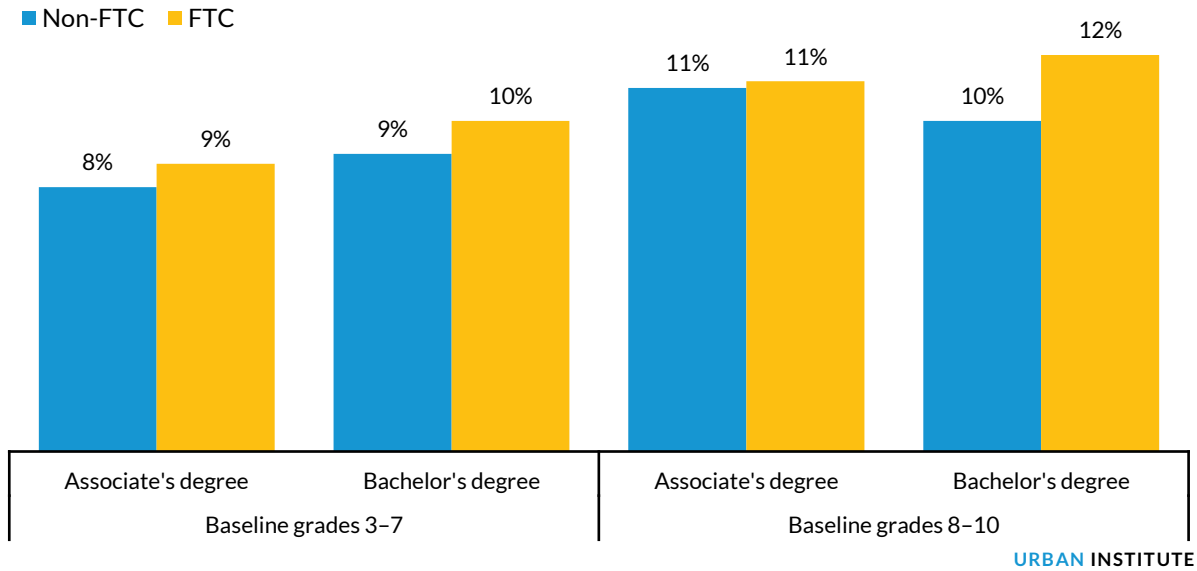
Finally, we estimate FTC participation effects on associate’s and bachelor’s degree attainment for the students we observed for at least three and six years following expected high school graduation for associate’s and bachelor’s degrees, respectively.⁸

Figure 3 shows consistently positive estimated impacts on bachelor’s degree attainment, with an increase of 1 percentage point (about 10 percent) among students who entered FTC in elementary or middle school and an increase of 2 percentage points (about 20 percent) for those who entered in high school. We find a similar increase in associate’s degree attainment for students who entered FTC in elementary or middle school (0.7 percentage points) but no significant impact for those who entered in high school.

As with enrollment, the estimated impact on degree attainment tends to increase with the number of years of FTC participation. For example, students who entered FTC in high school and remained in

the program for at least three years were about 5 percentage points more likely to earn bachelor's degrees, a 50 percent increase.

FIGURE 3
Effects of FTC Participation on Degree Attainment



Source: Authors' calculations from Step Up for Students program data, Florida Education Data Warehouse data, and National Student Clearinghouse data.

Notes: FTC = Florida Tax Credit. All FTC effects are statistically significant at $p < 0.05$, except for the effect on associate's degree attainment for students in baseline grades 8-10.

Milwaukee Voucher Program

The Milwaukee Parental Choice (voucher) Program (MPCP) began in fall 1990 as a five-year pilot program with seven private schools and 341 students. It was a highly constrained and targeted program, with eligible students limited to Milwaukee residents with incomes up to 175 percent of the federal poverty level. Participants had to have been in a Milwaukee public school in the previous year or entering kindergarten. Program participation was capped at 1 percent of the Milwaukee Public School (MPS) enrollment (approximately 1,000 students). Most importantly, the private schools had to be secular and could not enroll more than 49 percent of their students through the voucher program. The maximum voucher amount was \$2,446. Thus, the program was small, constrained in many ways, and open only to a minute portion of Milwaukee private schools, over 80 percent of which were religious at that time (Witte 2000, 44–6).

Over the next 25 years, the voucher program in Milwaukee grew substantially in terms of programs, policy changes, costs, and the numbers of schools and students participating. A major legislative change to allow entry of religious schools occurred in 1996, approved by the Wisconsin Supreme Court in 1998 and further supported by the 2002 US Supreme Court *Zelman v. Simmons-Harris* ruling that, under certain conditions common to school voucher programs, they do not violate the US Constitution.⁹ That change led to major increases in total students and in participating private schools that they could attend.

Throughout the program's history, the voucher has had to be accepted as the full cost of educating the child in her chosen private school. The maximum value of the voucher was held to a narrow range of \$6,442 to \$6,607 from 2006–07 to 2010–11, a period during which per pupil funding of MPS students increased from \$12,044 to \$14,863 (Wolf 2012).

New policies adopted in 2013 allowed the voucher's maximum value to increase at the annual rate of increase in K–12 public school spending in the state and provided slightly more voucher money for students in high school. More private schools joined the program, but so did more students. By the 2018–19 school year, 28,917 students were being educated in 129 participating private schools through the MPCP, an average of 224 voucher students per school (EdChoice 2019).

Data and Methods

The research was based on a random sample of 1,926 students in the MPCP in grades three through eight. We added all 801 ninth-grade MPCP students to this representative sample of elementary school students. We followed all the MPCP ninth-graders, instead of a random sample, because MPCP program enrollments were much lower in the high school grades and we knew that ninth-graders in 2006 were scheduled to graduate high school (or not) and perhaps enroll in college within the five-year timeline of our initial study. The total sample of MPCP students numbered 2,727.

We matched each MPCP student to a similar student at MPS in 2006 and tracked both groups in the study. Students were matched based on their exact grade level and neighborhood, a narrow band for their initial test scores, and a propensity score that included their initial test scores (again) and student demographic variables, including race, gender, and English language learner status (Witte et al. 2008). These data are linked to information on college enrollment and graduation from the National Student Clearinghouse, which we received on April 16, 2019.

We present results separately for students who were in third through eighth grade or were in ninth grade at baseline. For the latter group, we present results based on different sets of control variables, which are not available for all students in the sample. These procedures are described in detail in Wolf, Witte, and Kisida (2018), which used data on the same sample of students linked to NSC data through at least the end of 2017. This study presents updated results that track enrollment through at least the end of 2018.

Results

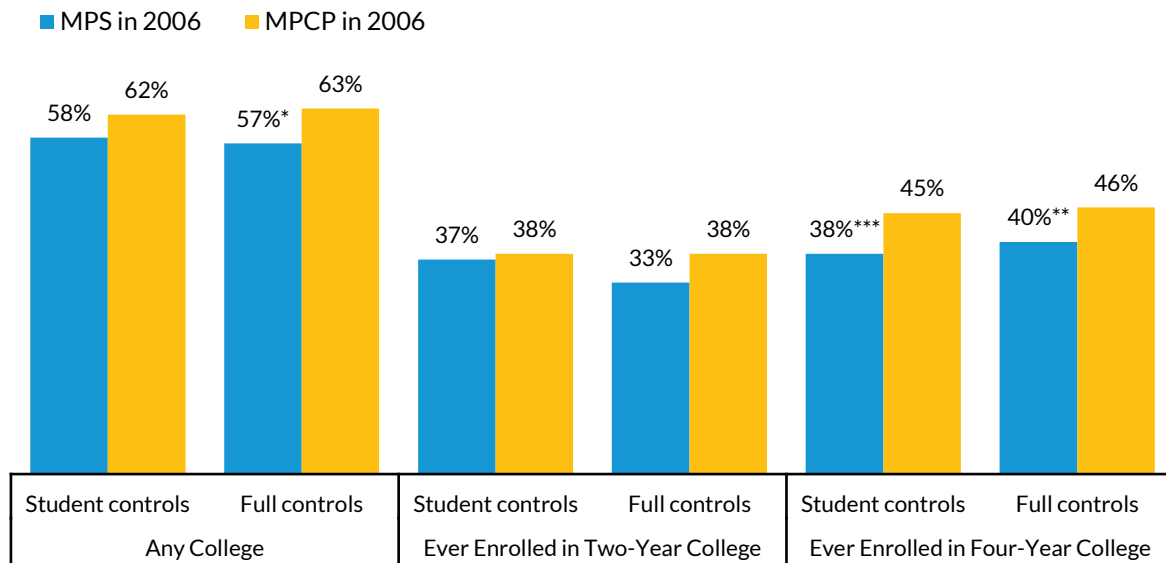
We begin by extending the findings for the 2006 ninth-grade students (Cowen et al. 2013). We present the results for the effects of MPCP student enrollment on the probability of ever enrolling in any type of college, the probability of ever enrolling in a two-year or four-year college, the probability of graduating from college, and the total amount of time spent in college. The appendix tables contain information on the effects of MPCP student enrollment on all 10 of our measures of attainment, including high school graduation. The results across all measures are similar to the results for the four specific measures we highlight below.

Ninth-grade students who were enrolled in the MPCP in 2006 were more likely to enroll in any type of college by 2018 than were their matched MPS peers (figure 4). The difference of 4 percentage points (62 percent versus 58 percent) in the statistical model with only student controls was not statistically

significant. The larger difference of 6 percentage points (63 percent versus 57 percent) in the statistical model with both student and parent controls was marginally statistically significant.

The effects of MPCP participation appear to be different for enrollment in two-year versus four-year colleges (figure 4). The baseline ninth-grade MPCP and MPS students attended two-year colleges at nearly equal rates of 37 and 38 percent, controlling for student background. The MPCP students held a 5 percentage-point advantage over the MPS students in the likelihood of two-year college enrollment once parent controls were added, but that difference was not statistically significant.

FIGURE 4
Effects of MPCP Participation on College Enrollment, Ninth Grade at Baseline



URBAN INSTITUTE

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Regression estimates with student controls (N = 1,289) include student race or ethnicity, gender, and baseline reading and math scores. Estimates with full controls (N = 863) add parent education, parent income, and parent religiosity. Robust standard errors are clustered by census tract. Estimates are marginal effects from probit estimations.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

We find stronger evidence that MPCP students in our ninth-grade sample enrolled in four-year colleges at higher rates than their matched MPS peers. Controlling for student background, the MPCP rate of ever enrolling in a four-year institution was 45 percent compared with 38 percent for MPS. The MPCP advantage of 7 percentage points in the probability of ever attending a four-year college or university was statistically significant. After parent controls were added to the model, the MPCP

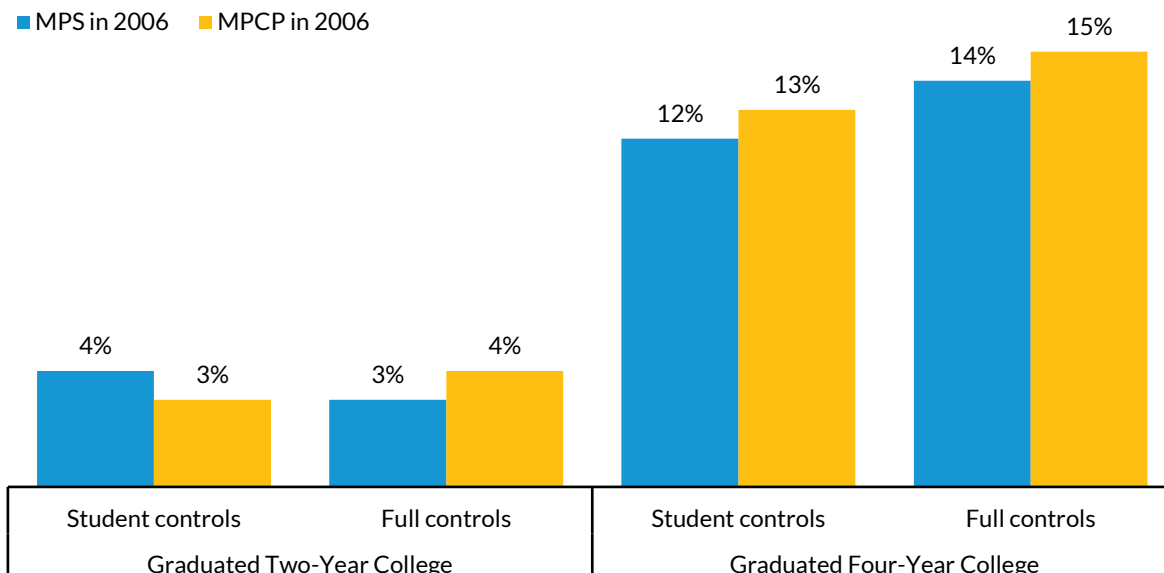
advantage in the probability of enrolling in a four-year institution was 6 percentage points (a difference of 15 percent) and statistically significant.

The evidence continues to be stronger for an MPCP effect on attainment in four-year institutions of higher education than two-year institutions, when total time at the institution is the attainment measure (appendix tables A.1–A.3). The Milwaukee students obtained an average of about three-quarters of a year of education at two-year colleges, whether they were MPCP or MPS ninth-graders in 2006 and whether we controlled for only student background or both student and parent background. Controlling for student background, the MPCP students completed an average of 1.4 years in a four-year college or university compared with 1.2 years for their matched MPS peers. The gain of an extra 20 percent of a year in four-year college attainment for the MPCP students was statistically significant. Once parent controls were added to the model, however, the MPCP advantage in time completed at a four-year college dropped to an extra 15 percent of a year and became statistically insignificant.

Although simply enrolling and spending some time in college benefits students, the ultimate attainment prize is college graduation. Low-income inner-city students traditionally struggle to complete college degrees (Bound, Lovenheim, and Turner 2012). Our results indicate that struggle continued in 2006 for the Milwaukee ninth-graders in our study. By 2018, the students had obtained two-year degrees at rates of 3 or 4 percent whether they were enrolled in MPCP or MPS and whether we controlled for only student or both student and parent background factors (figure 5). The estimated graduation rate from a four-year college was 13 to 15 percent for the MPCP students and a statistically similar 12 to 14 percent for their matched MPS peers, depending on the statistical model.

FIGURE 5

Effects of MPCP Participation on Degree Attainment, Ninth Grade at Baseline



URBAN INSTITUTE

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

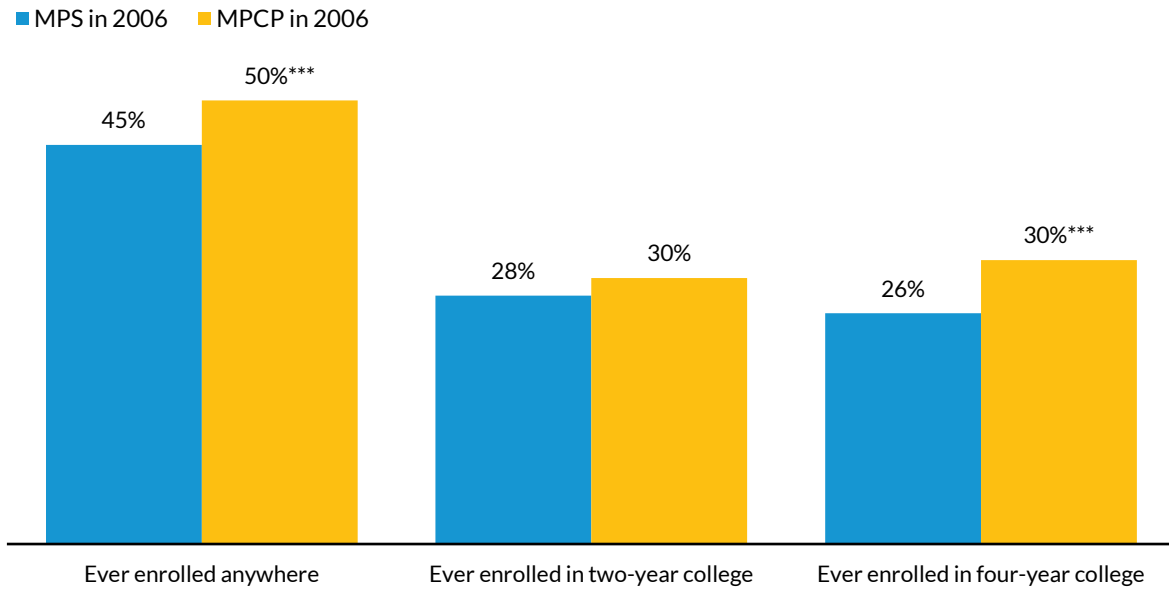
Notes: MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Regression estimates with student controls (N = 1,289) include student race or ethnicity, gender, and baseline reading and math scores. Estimates with full controls (N = 863) add parent education, parent income, and parent religiosity. Robust standard errors are clustered by census tract. Estimates are marginal effects from probit estimations.

What about our sample of students in third through eighth grade in 2006? Does that group generate clearer attainment results of the MPCP because of their larger sample size or less clear effects because we can only be sure that they attended private schools of choice in the elementary grades? We see a similar pattern of attainment effects for the younger sample of students in 2006 as we observed for the ninth-graders, with the exception that the students from elementary grades are also graduating college at higher rates. All the results we present here for the sample of students in grades three through eight in 2006 are based on statistical models that include student controls for gender, race or ethnicity, income, English language learner status, and 2006 test scores.

Students enrolled in the MPCP in grades three through eight in 2006 were 5 percentage points more likely than their matched MPS peers to enroll in any type of college by 2018 (50 percent versus 45 percent, an 11 percent difference). The higher college enrollment rate for the MPCP students was highly statistically significant (figure 6). The MPCP enrollment advantage for the younger sample of students is only clear regarding four-year colleges. MPCP students enrolled in two-year colleges at a rate that was 2 percentage points higher than their MPS peers (30 percent versus 28 percent), but that

difference was not statistically significant. The younger sample of MPCP students enrolled in four-year colleges at a rate that was 4 percentage points higher than their MPS peers (30 percent versus 26 percent) and that difference was highly statistically significant.

FIGURE 6
Effects of MPCP Participation on College Enrollment, Third through Eighth Grades at Baseline



URBAN INSTITUTE

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: N = 3,682. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Regression estimates include student race or ethnicity, gender, and baseline reading and math scores. Robust standard errors are clustered by census tract. Estimates are marginal effects from probit estimations.

*** $p < 0.01$.

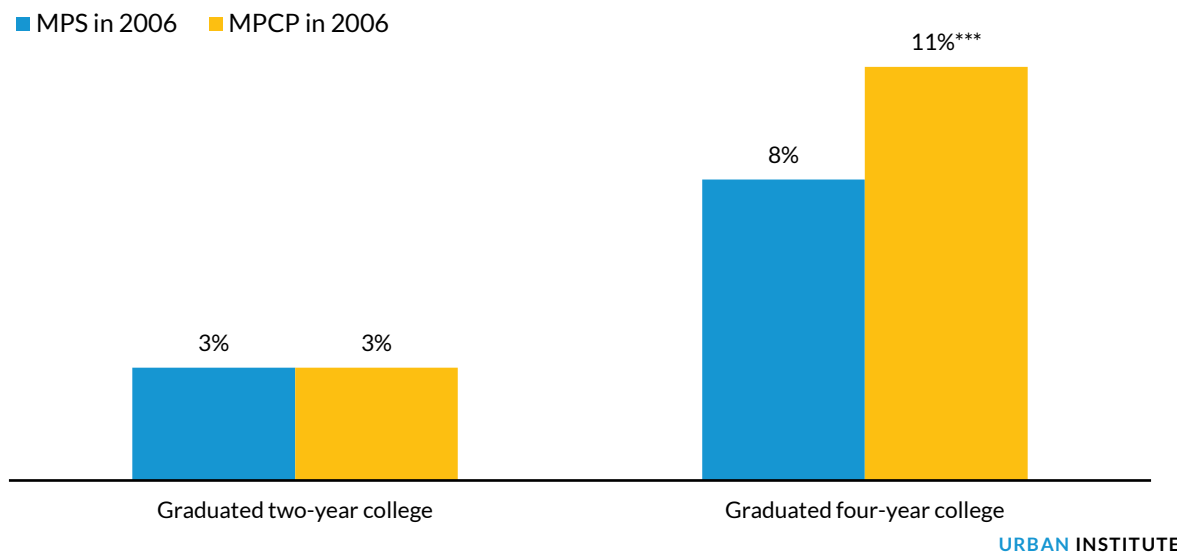
A similar pattern is apparent regarding the years of college completed by MPCP and MPS students in our 2006 third-through-eighth-grade sample (appendix tables A.4 and A.5). By 2018, both groups had averaged about slightly more than half a year at a two-year college. The MPCP students, however, averaged 15 percent of a year more time at a four-year college than the matched MPS students (0.94 of a year versus 0.79 of a year), another attainment advantage for the voucher students that was highly statistically significant.

Finally, in contrast to our ninth-grade sample, we see that students who were in grades three through eight in 2006 are graduating from college at higher rates if they were in the MPCP (figure 7). Only 3 percent of both the MPCP and MPS groups had graduated from a two-year college by 2018. The MPCP students graduated from four-year colleges at a rate that was 3 percentage points higher than

their MPS peers (11 percent versus 8 percent, a difference of 38 percent), and that difference was statistically significant. One reason for the lower graduation rates of the third-through-eighth-grade sample compared with the ninth-grade sample is that the younger students had less time to graduate from a four-year college when we collected our outcome data.

FIGURE 7

Effects of MPCP Participation on Degree Attainment, Third through Eighth Grades at Baseline



Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 3,682$; N for four-year graduation = 2,422. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Regression estimates include student race or ethnicity, gender, and baseline reading and math scores. Robust standard errors are clustered by census tract. Graduation from four-year college is limited to students in fifth grade and up in 2006–07.

*** $p < 0.01$.

Washington, DC, Voucher Program

The DC Opportunity Scholarship Program (OSP), created by an act of Congress in January 2004, provides scholarships to low-income families (defined as those making no more than 185 percent of the federal poverty level) to attend private schools. Scholarships are available only to DC residents attending participating DC private schools. Participating schools must agree to such requirements as nondiscrimination in admissions, fiscal accountability, and the provision of data and information for evaluation purposes (Wolf et al. 2005).

The program has enrolled between 1,000 and 2,000 students each year since its inception in 2004–05, with a peak of 1,930 in 2007–08 (Chingos 2018), and 1,653 enrolled in the most recent year for which data are available (2017–18).¹⁰ Scholarship amounts were initially capped at \$7,500 (about \$9,700 in 2017 dollars) (Wolf et al. 2005); the maximum is now \$9,022 for elementary and middle school and \$13,534 for high school.¹¹

Enrollment in the program is small relative to public school enrollment in DC. OSP enrollment has never exceeded 3 percent of total enrollment (district, public charter, and OSP) and is currently closer to 2 percent.¹² This largely reflects the fact that program funding can accommodate only a limited number of students (roughly 1,200 scholarships per year in recent years).¹³

Data and Methods

The present study builds on existing work on the OSP by using administrative records to measure the college enrollment patterns of participants in the first two lotteries. We track the college enrollment outcomes of a subset of 1,776 students who applied for a scholarship in 2004 or 2005 and are now old enough to have potentially graduated from high school and enrolled in college.

Urban Institute researchers worked with the current OSP administrator, Serving Our Children (SOC), to reconstruct baseline files from the original lottery applications that the Washington Scholarship Fund (the original OSP administrator) used in 2004 and 2005 and matched them to college enrollment records from the National Student Clearinghouse.

Urban and SOC put in place strict procedures to ensure that applicants' personally identifiable information was never released to anyone outside SOC. First, SOC provided Urban deidentified application data, which Urban used to select applicants for inclusion in this study. Second, SOC provided

Urban names and dates of birth for these students using a different random identifier (which could not be linked back to the application data). These data included additional names and birth dates to obscure the identities of OSP applicants. Third, Urban provided the names and birth dates to the NSC and then sent the matched data to SOC. Finally, SOC returned the matched data to Urban with the identifiers and nonapplicants removed.

These procedures are described in detail in Chingos (2018), which included 1,594 students from the original lotteries. The results in the present study are updated to include an additional 182 students who are now old enough to be observed for at least two years following expected high school graduation, for a total of 1,776 students. Descriptive statistics for this sample of students are provided in appendix table A.6. All results are weighted to reflect applicants' likelihood of winning the lottery, as described in Chingos (2018).

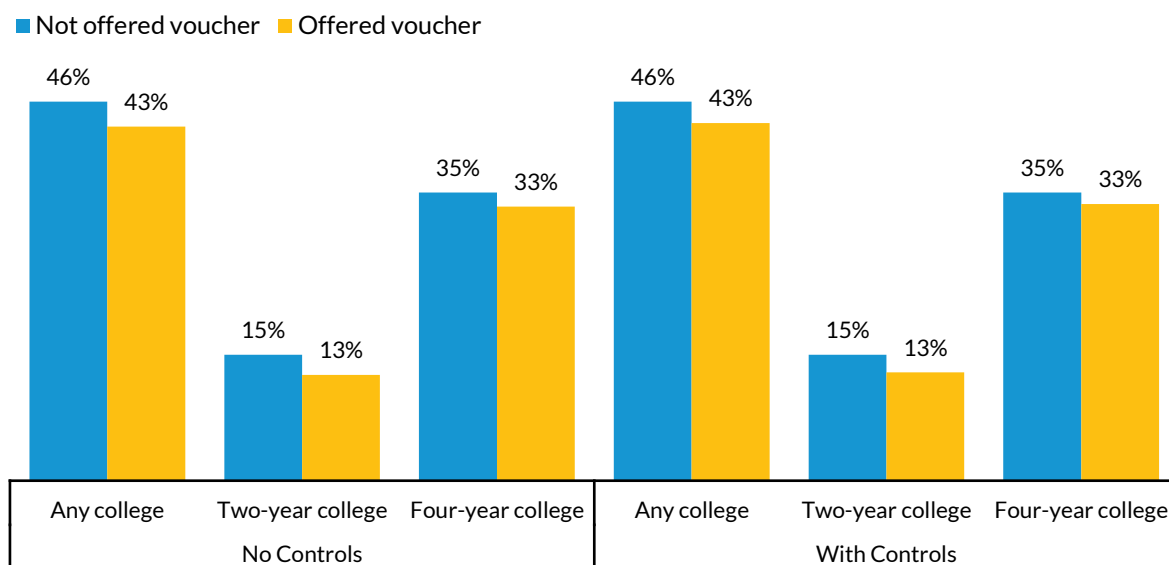
These estimates are “intent to treat” (ITT) in that they capture the effects of being offered a scholarship, when in fact many students who were offered a scholarship did not use one. Among all students who won the lottery, 70 percent used a scholarship for at least one year.¹⁴ We report only ITT estimates throughout this study, but the effects of using a scholarship for at least one year can be calculated by dividing the ITT estimates by 0.7.¹⁵

Results

Our main findings are reported in figure 8, and detailed regression results are provided in appendix table A.7. Overall, students offered a scholarship were somewhat less likely to enroll in college within two years of expected graduation from high school: 43 percent did compared with 46 percent of applicants who lost the lottery. None of these differences are statistically distinguishable from zero at conventional levels.

This pattern holds for both two- and four-year colleges and for four-year public and four-year private colleges (appendix table A.7). Adding control variables has little impact on the results, as would be expected given random assignment.

FIGURE 8
Effects of OSP Voucher Offers on College Enrollment
within Two Years of Expected High School Graduation



URBAN INSTITUTE

Source: Authors' calculations from linked OSP and National Student Clearinghouse data.

Notes: OSP = Opportunity Scholarship Program. None of the reported differences are statistically significant at conventional levels. For detailed regression results, see appendix table A.7.

We observe a subset of students for more than two years after expected high school graduation, with fewer students observed for longer periods. Figure 9 reports the effects of winning the OSP lottery on college enrollment within two, three, four, and five years of expected high school graduation. None of the estimates are statistically distinguishable from zero, but the modest negative estimate for the full sample becomes a small positive estimate for those observed for at least four years.

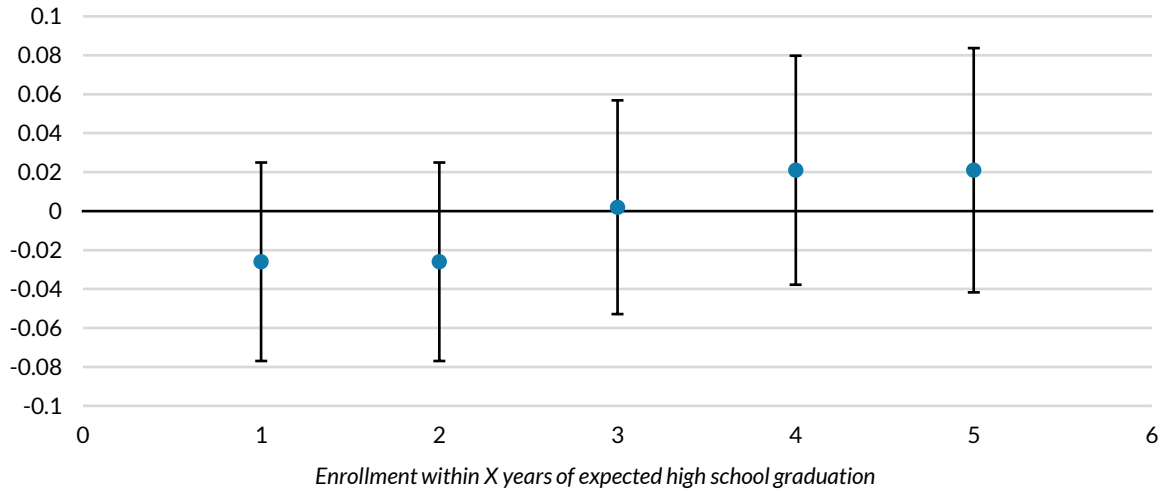
This result suggests that the negative estimate in the short run merely reflects a delay in when some students enter college, perhaps because private schools are more likely to hold them back for multiple grades or because their entrance into college is more likely to be delayed for other reasons.

The change in results may also be in part because of the change in the sample of students examined. We find somewhat less negative two-year impacts for students observed for four or five years than for students observed for two or three years, mostly because of differences in the control group's enrollment rate (appendix table A.8).¹⁶

FIGURE 9

Effects of OSP Voucher Offers on College Enrollment within Five Years of High School Graduation

Effect of scholarship offer (with 95 percent confidence intervals)



URBAN INSTITUTE

Source: Authors' calculations from linked OSP and National Student Clearinghouse data.

Notes: OSP = Opportunity Scholarship Program. For detailed regression results, see appendix table A.8 specifications with maximum possible sample size for each outcome.

It is important to interpret these results in light of the imprecision of the estimates. For example, the three-year result reported in figure 9 cannot rule out a zero effect at the 95 percent confidence level, but it also cannot rule out a negative effect of 5 percentage points or a positive effect of 6 percentage points. Such effects would roughly correspond to 10 percent changes relative to the control group's college enrollment rate of 48 percent.

Finally, we estimate the effects of winning a scholarship for subgroups of students, defined based on demographic characteristics and the types of schools they attended at the time of application. There is no compelling evidence of effect heterogeneity, though the effects are often imprecisely estimated given the reduced sample size (appendix table A.9).

Conclusion

In Florida and Milwaukee, students who participated in private school choice programs were more likely to enroll in and graduate from college than similar students who remained in public schools. In Florida, college enrollment rates were 6 to 10 percentage points higher among students who attended a private school, and bachelor's degree attainment rates were 1 or 2 percentage points higher. In Milwaukee, enrollment and attainment rates were 4 to 6 and 1 to 3 percentage points higher, respectively.

The Washington, DC, results are qualitatively different, as they indicate no statistically detectable difference between students who won and lost the voucher lottery. These results are an important addition to the research on this program, especially because they are the only college enrollment findings based on a randomized experiment. But they tend to be less precise given the smaller sample size, and the nonparticipating students had access to a significantly greater amount of public school choice (in the form of charter schools) than students in Florida and Milwaukee.

Even the most encouraging results from these studies show discouraging college completion rates for low-income students, regardless of whether they participate in a choice program. For example, only 10 to 12 percent of participants in Florida's tax credit scholarship program completed a bachelor's degree, despite the fact that 57 to 64 percent enrolled in college (including 23 to 27 percent enrolling at four-year colleges).

These outcomes are consistent with national data on college enrollment and completion among students from families of lower socioeconomic status who would likely be eligible for means-tested choice programs. Among students from the bottom quarter of families in terms of socioeconomic status, 71 percent enrolled in college (compared with 96 percent among students of high socioeconomic status). Bachelor's degree attainment rates are lower across the board: 14 percent among the bottom quarter of the socioeconomic status distribution, compared with 60 percent for the top quarter (NCES 2015, figure 1).

Thus, although these results suggest that private school choice programs can move the needle on college enrollment and graduation, more needs to be done to prepare students for college, sustain their enrollment at institutions likely to serve them well, and provide the support they need to persist to completion.

The most important limitation of any study that examines long-term outcomes is that it is outdated by the time results are available. That is surely the case for all three policies examined in this report.

Florida's program has rapidly expanded, and now, most participating students attend schools where most students are on a scholarship (Chingos 2017). Milwaukee's program has expanded as well. The DC voucher program has not grown, but the city's public education system has changed as more students attend charter schools and academic performance has increased.¹⁷

Policymakers need information on how programs affect students' lives beyond their performance on standardized tests, but they also need information on how programs are working now, not just how they worked 10 or 15 years ago. Identifying short-term indicators that are predictive of long-term performance should be a top priority for researchers, as doing so would identify programs likely to boost students' long-term success, regardless of whether those programs involve public or private schools.¹⁸

Appendix Tables

Milwaukee

TABLE A.1
Ninth-Grade Sample Estimates with No Controls

	MPS in 2006	MPCP in 2006	Difference	P value
Graduated from high school	0.78	0.81	0.03 (0.02)	0.19
Ever enrolled in any college	0.56	0.59	0.03 (0.02)	0.23
Ever enrolled in two-year college	0.35	0.36	0.01 (0.02)	0.53
At least one year in two-year college	0.33	0.35	0.02 (0.02)	0.43
Total years in two-year college	0.81	0.73	-0.07 (0.07)	0.29
Graduated from two-year college	0.04	0.03	-0.01 (0.01)	0.40
Ever enrolled in four-year college	0.37	0.42	0.05** (0.02)	0.05
At least one year in four-year college	0.36	0.41	0.05** (0.02)	0.04
Total years in four-year college	1.13	1.34	0.21** (0.10)	0.04
Graduated from four-year college	0.12	0.12	0.00 (0.02)	0.88

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 1,602$. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Average treatment effect estimates from binary outcomes are marginal effects of 2006 MPCP enrollment from probit estimations, with standard errors in parentheses.

** $p < 0.05$.

TABLE A.2

Ninth-Grade Sample Estimates with Limited Controls

	MPS in 2006	MPCP in 2006	Difference	P value
Graduated from high school	0.81	0.84	0.03 (0.02)	0.18
Ever enrolled in any college	0.58	0.62	0.04 (0.03)	0.12
Ever enrolled in two-year college	0.37	0.38	0.01 (0.03)	0.76
At least one year in two-year college	0.35	0.36	0.01 (0.03)	0.76
Total years in two-year college	0.87	0.75	-0.12 (0.09)	0.19
Graduated from two-year college	0.04	0.03	-0.01 (0.01)	0.42
Ever enrolled in four-year college	0.38	0.45	0.07*** (0.03)	0.01
At least one year in four-year college	0.37	0.44	0.07*** (0.03)	0.01
Total years in four-year college	1.20	1.40	0.20** (0.10)	0.05
Graduated from four-year college	0.13	0.14	0.01 (0.02)	0.75

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 1,289$. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Average treatment effect estimates are from regressions that control for student race or ethnicity, gender, and baseline reading and math scores. Robust standard errors are clustered by census tract. Estimates from binary outcomes are marginal effects of 2006 MPCP enrollment from probit estimations, with standard errors in parentheses.

** $p < 0.05$; *** $p < 0.01$.

TABLE A.3

Ninth-Grade Sample with Subsample Controls for Parental Characteristics

	MPS in 2006	MPCP in 2006	Difference	P value
Graduated high school	0.79	0.86	0.07*** (0.03)	0.01
Ever enrolled in any college	0.57	0.63	0.06* (0.03)	0.08
Ever enrolled in two-year college	0.33	0.38	0.04 (0.03)	0.20
At least one year in two-year college	0.32	0.36	0.04 (0.03)	0.26
Total years in two-year college	0.77	0.77	0.00 (0.11)	1.00
Graduated two-year college	0.03	0.04	0.01 (0.01)	0.46
Ever enrolled in four-year college	0.40	0.46	0.06** (0.03)	0.03
At least one year in four-year college	0.39	0.45	0.07** (0.03)	0.02
Total years in four-year college	1.21	1.36	0.15 (0.12)	0.22
Graduated four-year college	0.14	0.15	0.01 (0.02)	0.71

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 863$; N for high-school graduation = 760. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Average treatment effect estimates from regressions that control for student race or ethnicity, gender, baseline reading and math scores, parent education, parent income, and parent religiosity. Robust standard errors are clustered by census tract. Estimates from binary outcomes are marginal effects of 2006 MPCP enrollment from probit estimations, with standard errors in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

TABLE A.4

Third-through-Eighth-Grade Sample MPCP Estimates with No Controls

	MPS in 2006	MPCP in 2006	Difference	P value
Ever enrolled in any college	0.45	0.48	0.03 (0.02)	0.11
Ever enrolled in two-year college	0.28	0.29	0.01 (0.01)	0.41
At least one year in two-year college	0.28	0.29	0.01 (0.01)	0.37
Total years in two-year college	0.57	0.58	0.00 (0.04)	0.91
Graduated from two-year college	0.03	0.03	0.00 (0.01)	0.39
Ever enrolled in four-year college	0.26	0.30	0.03** (0.01)	0.03
At least one year in four-year college	0.26	0.29	0.03** (0.01)	0.04
Total years in four-year college	0.79	0.88	0.10* (0.05)	0.08
Graduated from four-year college	0.08	0.09	0.01 (0.01)	0.23

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 3,682$; N for four-year graduation = 2,422. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Average treatment effect estimates from regressions that include student race or ethnicity, gender, and baseline reading and math scores. Robust standard errors are clustered by census tract. Estimates are marginal effects of 2006 MPCP enrollment from probit estimations, with standard errors in parentheses. Graduation from two-year and four-year college is limited to students in fourth grade and up or sixth grade and up in 2006–07, respectively (allowing them a minimum of two or four years after on-time high school graduation).

* $p < 0.1$; ** $p < 0.05$.

TABLE A.5

Third-through-Eighth-Grade Sample MPCP Estimates with Student Controls

	MPS in 2006	MPCP in 2006	Difference	P value
Ever enrolled in any college	0.45	0.50	0.05*** (0.01)	0.00
Ever enrolled in two-year college	0.28	0.30	0.01 (0.01)	0.12
At least one year in two-year college	0.28	0.30	0.02* (0.01)	0.10
Total years in two-year college	0.57	0.60	0.02 (0.04)	0.53
Graduated from two-year college	0.03	0.03	0.00 (0.01)	0.80
Ever enrolled in four-year college	0.26	0.32	0.05*** (0.01)	0.00
At least one year in four-year college	0.26	0.31	0.05*** (0.01)	0.00
Total years in four-year college	0.79	0.94	0.15*** (0.05)	0.00
Graduated from four-year college	0.08	0.11	0.03*** (0.01)	0.00

Source: Authors' calculations from MPCP evaluation data and National Student Clearinghouse data.

Notes: $N = 3,682$; N for four-year graduation = 2,422. MPCP = Milwaukee Parental Choice Program; MPS = Milwaukee Public Schools. Average treatment effect estimates from regressions that include student race or ethnicity, gender, and baseline reading and math scores. Robust standard errors are clustered by census tract. Estimates are marginal effects of 2006 MPCP enrollment from probit estimations, with standard errors in parentheses. Graduation from two-year and four-year college is limited to students in fourth grade and up or sixth grade and up in 2006–07, respectively (allowing them a minimum of two or four years after on-time high school graduation).

* $p < 0.1$; *** $p < 0.01$.

Washington, DC

TABLE A.6
Descriptive Statistics

	Control	Treatment	Difference	P value of difference
Race or ethnicity				
Black	87%	87%	0.3%	0.85
Hispanic	8%	11%	2.2%	0.12
Not black or Hispanic	5%	3%	-2.2%	0.02
Female	51%	48%	-3.0%	0.21
Parents or guardians married	19%	19%	-0.5%	0.77
Parent or guardian owns home	13%	14%	0.8%	0.62
Age	11.8	11.9	0.1	0.48
Income missing	19%	19%	-0.5%	0.79
Family income	\$18,904	\$17,691	-\$1,213	0.04
Charter at baseline	25%	25%	-0.4%	0.86
Observations (unweighted)	717	1,059		

Source: Authors' calculations from linked Opportunity Scholarship Program and National Student Clearinghouse data.

TABLE A.7
Effects of Scholarship Offers on College Enrollment
within Two Years of Expected High School Graduation

	Any college	Four-year college	Two-year college	Full-time enrollment	Four-year public college	Four-year private college
Without controls	-0.030 (0.026)	-0.017 (0.025)	-0.024 (0.018)	-0.018 (0.025)	-0.013 (0.022)	-0.016 (0.018)
With controls	-0.026 (0.026)	-0.014 (0.025)	-0.021 (0.017)	-0.012 (0.025)	-0.011 (0.022)	-0.015 (0.017)
Control mean	0.455	0.346	0.151	0.343	0.239	0.136
Observations	1,776	1,776	1,776	1,776	1,776	1,776

Source: Authors' calculations from linked Opportunity Scholarship Program and National Student Clearinghouse data.

Notes: Robust standard errors adjusted for clustering on family appear in parentheses. Treatment estimates are marginal effects from probit regressions. Controls include race or ethnicity (black or Hispanic, with neither or missing as the omitted category), gender, whether parents or guardians were married, whether parents or guardians owned home, age, natural log of family income (with missing coded as zero), and whether income was missing. All models are weighted using baseline weights.

TABLE A.8

**Effects of Scholarship Offers on College Enrollment
within Five Years of Expected High School Graduation**

	Enrollment at Any College within				
	1 year	2 years	3 years	4 years	5 years
Expected high school graduation 2005-15 (N = 1,594)	-0.026 (0.026) 0.385	-0.026 (0.026) 0.455			
Expected high school graduation 2005-14 (N = 1,421)	-0.029 (0.027) 0.390	-0.020 (0.028) 0.454	0.002 (0.028) 0.477		
Expected high school graduation 2005-13 (N = 1,243)	-0.013 (0.028) 0.369	-0.007 (0.030) 0.435	0.015 (0.030) 0.459	0.021 (0.030) 0.473	
Expected high school graduation 2005-12 (N = 1,105)	-0.014 (0.031) 0.379	-0.005 (0.032) 0.440	0.014 (0.032) 0.467	0.020 (0.032) 0.482	0.021 (0.032) 0.496

Source: Authors' calculations from linked Opportunity Scholarship Program and National Student Clearinghouse data.

Notes: For each regression, we report the coefficient (marginal effect from probit regression), standard error (adjusted for clustering on family), and control mean. All models include controls listed in notes to table A.7 and are weighted using baseline weights.

TABLE A.9

**Subgroup Analysis, Effects of Scholarship Offers on Enrollment
at Any College within Two Years of Expected High School Graduation**

	No Controls		With Controls		C mean	Obs.
	Estimate	Std. error	Estimate	Std. error		
Black	-0.039	(0.028)	-0.033	(0.028)	0.457	1,552
Hispanic	-0.063	(0.085)	-0.062	(0.089)	0.479	175
Not black or Hispanic	0.255*	(0.133)	0.231	(0.158)	0.372	69
Female	-0.027	(0.037)	-0.029	(0.037)	0.495	878
Male	-0.028	(0.036)	-0.027	(0.036)	0.412	898
School ever SINI	-0.052	(0.037)	-0.040	(0.037)	0.476	925
School never SINI	-0.008	(0.036)	-0.010	(0.036)	0.434	851
Entering grades 3-5	-0.064	(0.049)	-0.057	(0.049)	0.505	489
Entering grades 6-8	0.022	(0.043)	0.026	(0.043)	0.417	703
Entering grades 9-12	-0.060	(0.053)	-0.060	(0.054)	0.459	405
Charter at baseline	-0.037	(0.054)	-0.056	(0.054)	0.538	442
Not charter at baseline	-0.027	(0.030)	-0.023	(0.030)	0.426	1,334

Source: Authors' calculations from linked Opportunity Scholarship Program and National Student Clearinghouse data.

Notes: SINI= school in need or improvement. Robust standard errors adjusted for clustering by family appear in parentheses.

Controls include those listed in table A.7. All models are weighted using baseline weights.

* $p < 0.1$.

Notes

- ¹ Parts of this report are taken from the prior Urban Institute publications listed in this paragraph.
- ² Considerable growth in the program after 2009 has been fueled by including the alcoholic beverage excise tax as a source of tax credit funding. In recent years, most donations have resulted in credits to the alcoholic beverage excise tax (Step Up for Students 2016, 14).
- ³ Some FTC students are served by another scholarship funding organization, AAA, which served 989 students (1 percent) in 2016–17.
- ⁴ Specifically, beginning in 2006–07, students could continue in the program as long as their family income was below 200 percent of the federal poverty level (FPL) (see 2006-75 Fla. Laws 1–28). The eligibility threshold for continuation in the program was increased to 230 percent beginning in 2010–11, but if the student’s household income was between 200 and 215 percent of the federal poverty level, her scholarship would be reduced by 25 percent, and if her income was between 215 and 230 percent, the scholarship would be reduced by 50 percent (see 2010-24 Fla. Laws 1–31). Since the 2016–17 school year, scholarships have been available to both new and continuing students up to 260 percent of the FPL. The scholarship amount would be reduced by 12 percent if the household income level was between 200 and 215 percent of the FPL, by 26 percent if between 215 and 230 percent of the FPL, by 40 percent if between 230 and 245 percent of the FPL, and by 50 percent if between 245 and 260 percent of the FPL (see 2014-184 Fla. Laws 1–82).
- ⁵ See 2014-184 Fla. Laws 1–82.
- ⁶ See 2012-22 Fla. Laws 1–7 and 2014-184 Fla. Laws 1–82.
- ⁷ See Chingos and Kuehn (2017) for a detailed discussion.
- ⁸ We do not restrict the measurement of degree attainment to this window (e.g., we still count a bachelor’s degree obtained seven years after expected high school graduation if the student is observed for at least that long).
- ⁹ *Zelman v. Simmons-Harris*, 536 U.S. 639 (2002).
- ¹⁰ “Find a Participating Private School,” *Serving Our Children*, accessed June 6, 2019, <https://servingourchildrenc.org/>.
- ¹¹ See also “For Parents,” *Serving Our Children*, accessed June 6, 2019, <https://servingourchildrenc.org/our-program/>.
- ¹² Authors’ calculations from the Common Core of Data Public School Universe.
- ¹³ Of the \$15 million annual appropriation, about \$12 million is for scholarships (the remaining \$3 million is for program administration and evaluation), which averages roughly \$10,000 per student.
- ¹⁴ This statistic is weighted using the base weights.
- ¹⁵ This Bloom adjustment requires the assumption that winning the lottery had no impact on students who did not ever use a scholarship.
- ¹⁶ This could reflect improvements in the DC public school system, which younger cohorts (those observed for fewer years after expected high school graduation) potentially attended for a greater number of more-recent years. But below, we find no consistent evidence of differential effects for students who entered the program in earlier versus later grades.
- ¹⁷ Kristin Blagg and Matthew Chingos, “Does Gentrification Explain Rising Student Scores in Washington, DC?” *Urban Wire* (blog), Urban Institute, May 23, 2016, <https://www.urban.org/urban-wire/does-gentrification-explain-rising-student-scores-washington-dc>.

¹⁸ These short-term measures should not only predict long-term outcomes, but interventions that affect the short-term measure should also affect the long-term measures. Research by Hitt, McShane, and Wolf (2018) suggests that the initial test-score effects of school choice programs do not consistently predict these programs' long-term attainment effects.

References

- Belfield, Clive R., and Henry M. Levin. 2007. "The Return on Investment for Improving California's High School Graduation Rate." Santa Barbara: California Dropout Research Project.
- Betts, Julian R., Lorien A. Rice, Andrew C. Zau, Y. Emily Tang, and Cory R. Koedel. 2006. *Does School Choice Work? Effects on Student Integration and Achievement*. San Francisco: Public Policy Institute of California.
- Bifulco, Robert, and Helen F. Ladd. 2007. "School Choice, Racial Segregation, and Test Score Gaps: Evidence from North Carolina's Charter School Program." *Journal of Policy Analysis and Management* 26 (1): 31–56.
- Bound, John, Michael F. Lovenheim, and Sarah Turner. 2012. "Increasing Time to Baccalaureate Degree in the United States." *Education Finance and Policy* 7 (4): 375–424.
- Campbell, David E. 2008. "The Civic Side of School Choice: An Empirical Analysis of Civic Education in Public and Private Schools." *Brigham Young University Law Review* 2008 (2): 487–523.
- Carneiro, Pedro, James J. Heckman, and Edward Vytlačil. 2003. "Understanding What Instrumental Variables Estimate: Estimating Marginal and Average Returns to Education." Working paper. Chicago: University of Chicago.
- Chingos, Matthew M. 2017. "Are Low-Quality Private Schools on the Rise in Florida?" Washington, DC: Brookings Institution.
- . 2018. *The Effect of the DC School Voucher Program on College Enrollment*. Washington, DC: Urban Institute.
- Chingos, Matthew M., and Daniel Kuehn. 2017. *The Effects of Statewide Private School Choice on College Enrollment and Graduation*. Washington, DC: Urban Institute.
- Chingos, Matthew M., Tomas Monarrez, and Daniel Kuehn. 2019. "The Effects of the Florida Tax Credit Scholarship on College Enrollment and Graduation: An Update." Washington, DC: Urban Institute.
- Cowen, Joshua M., David J. Fleming, John F. Witte, Patrick J. Wolf, and Brian Kisida. 2013. "School Vouchers and Student Attainment: Evidence from a State-Mandated Study of the Milwaukee Parental Choice Program." *Policy Studies Journal* 41 (1): 147–67.
- Day, Jennifer Cheeseman, and Eric C. Newburger. 2002. "The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings." Washington, DC: US Census Bureau.
- Dee, Thomas S. 2005. "The Effects of Catholic Schooling on Civic Participation." *International Tax and Public Finance* 12 (5): 605–25.
- EdChoice. 2019. *The ABCs of School Choice: The Comprehensive Guide to Every Private School Choice Program in America*. Indianapolis: EdChoice.
- Egalite, Anna J., Jonathan N. Mills, and Patrick J. Wolf. 2017. "The Impact of Targeted School Vouchers on Racial Stratification in Louisiana Schools." *Education and Urban Society* 49 (3): 271–96.
- Egalite, Anna J., and Patrick J. Wolf. 2016. "A Review of the Empirical Research on Private School Choice." *Peabody Journal of Education* 91 (4): 441–54.
- Figlio, David, and Cassandra M. D. Hart. 2014. "Competitive Effects of Means-Tested School Vouchers." *American Economic Journal: Applied Economics* 6 (1): 133–56.
- Figlio, David, and Krzysztof Karbownik. 2016. *Evaluation of Ohio's EdChoice Scholarship Program: Selection, Competition, and Performance Effects*. Washington, DC: Thomas B. Fordham Institute.
- Greene, Jay P. 2005. "Choosing Integration." In *School Choice and Diversity: What the Evidence Says*, edited by Janelle Scott, 27–41. New York: Teachers College Press.

- Hitt, Collin, Michael Q. McShane, and Patrick J. Wolf. 2018. "Do Impacts on Test Scores Even Matter? Lessons from Long-Run Outcomes in School Choice Research." Washington, DC: American Enterprise Institute.
- Howell, William G., and Paul E. Peterson. 2002. *The Education Gap: Vouchers and Urban Schools*. Washington, DC: Brookings Institution Press.
- Howell, William G., Paul E. Peterson, Patrick J. Wolf, and David E. Campbell. 2006. *The Education Gap: Vouchers and Urban Schools*. Revised Edition. Washington, DC: Brookings Institution Press.
- Kisida, Brian, and Patrick J. Wolf. 2015. "Customer Satisfaction and Educational Outcomes: Experimental Impacts of the Market-Based Delivery of Public Education." *International Public Management Journal* 18 (2): 265–85.
- Levitt, Steven D., and Lance Lochner. 2001. "The Determinants of Juvenile Crime." In *Risky Behavior among Youths: An Economic Analysis*, edited by Jonathan Gruber, 327–74. Chicago: University of Chicago Press.
- Lleras-Muney, Adriana. 2005. "The Relationship between Education and Adult Morality in the United States." *Review of Economic Studies* 72 (1): 180–221.
- Meara, Ellen, Seth Richards, and David Cutler. 2008. "The Gap Gets Bigger: Changes in Mortality and Life Expectancy, by Education, 1981–2000." *Health Affairs* 27 (2): 350–60.
- Muennig, Peter. 2005. "The Economic Value of Health Gains Associated with Education Interventions." Paper presented at the Equity Symposium on the Social Costs of Inadequate Education, Teachers' College, Columbia University, New York, October 24–25.
- NCES (National Center for Education Statistics). 2015. "Postsecondary Attainment: Differences by Socioeconomic Status." Washington, DC: US Department of Education, Institute of Education Sciences, NCES.
- Neal, Derek. 2006. "How Families and Schools Shape the Achievement Gap." In *Generational Change: Closing the Test Score Gap*, edited by Paul E. Peterson. Lanham, MD: Rowman and Littlefield.
- Shakeel, M. Danish, Kaitlin P. Anderson, and Patrick J. Wolf. 2016. "The Participant Effects of Private School Vouchers across the Globe: A Meta-Analytic and Systematic Review." Working Paper 2016-07. Fayetteville: University of Arkansas, College of Education and Health Professions, Department of Education Reform.
- Schneider, Mark, Paul Teske, Melissa Marschall, Michael Mintrom, and Christine Roch. 1997. "Institutional Arrangements and the Creation of Social Capital: The Effects of Public School Choice." *American Political Science Review* 91 (1): 82–93.
- Step Up for Students. 2016. *2015–2016 Step Up for Students Annual Report*. Jacksonville, FL: Step Up for Students.
- Waddington, R. Joseph, and Mark Berends. 2017. *Impact of the Indiana Choice Scholarship Program: Achievement Effects for Students in Upper Elementary and Middle School*. Notre Dame, IN: Notre Dame University, Center for Research on Educational Opportunity.
- Wirt, John, Susan Choy, Patrick Rooney, Stephen Provasnik, Anindita Sen, and Richard Tobin. 2004. *The Condition of Education*. Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Statistics.
- Witte, John F. 2000. *The Market Approach to Education: An Analysis of America's First Voucher Program*. Princeton, NJ: Princeton University Press.
- Witte, John F., Patrick J. Wolf, Joshua Cowen, David J. Fleming, and Juanita Lucas-McLean. 2008. *MPCP Longitudinal Educational Growth Study Baseline Report*. Milwaukee Evaluation report 5. Fayetteville: University of Arkansas.
- Wolf, Patrick J., Babette Gutmann, Nada Eissa, and Michael Puma. 2005. *Evaluation of the DC Opportunity Scholarship Program: First-Year Report on Participation*. Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.

- Wolf, Patrick J., Babette Gutmann, Michael Puma, Brian Kisida, Lou Rizzo, Nada Eissa, and Matthew Carr. 2010. *Evaluation of the DC Opportunity Scholarship Program: Final Report*. Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.
- Wolf, Patrick J. 2012. *The Comprehensive Longitudinal Evaluation of the Milwaukee Parental Choice Program: Summary of Final Reports*. Milwaukee Evaluation report 36. Fayetteville: University of Arkansas.
- Wolf, Patrick J., and Shannon Lasserre-Cortez. 2018. *Special Education Enrollment and Classification in Louisiana Charter Schools and Traditional Schools*. Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest.
- Wolf, Patrick J., Jonathan N. Mills, Yujie Sude, Heidi H. Erickson, and Matthew L. Lee. 2019. "How Has the Louisiana Scholarship Program Affected Students? A Comprehensive Summary of Effects after Four Years." Fayetteville: University of Arkansas, College of Education and Health Professions, Department of Education Reform.
- Wolf, Patrick J., John F. Witte, and David J. Fleming. 2012. "Special Choices: Do Voucher Schools Serve Students with Disabilities?" *Education Next* 12 (3): 16–22.
- Wolf, Patrick J., John F. Witte, and Brian Kisida. 2018. *Do Voucher Students Attain Higher Levels of Education? Extended Evidence from the Milwaukee Parental Choice Program*. Washington, DC: Urban Institute.
- Zimmer, Ron, Brian Gill, Kevin Booker, Stephane Lavertu, Tim R. Sass, and John F. Witte. 2009. *Charter Schools in Eight States: Effects on Achievement, Attainment, Integration and Competition*. Santa Monica, CA: RAND Corporation.

About the Authors

Matthew M. Chingos is vice president for education data and policy at the Urban Institute.

Daniel Kuehn is a research associate in the Income and Benefits Policy Center at the Urban Institute.

Tomas Monarrez is a research associate in the Center on Education Data and Policy at the Urban Institute.

Patrick J. Wolf is a distinguished professor of education policy at the University of Arkansas in Fayetteville.

John F. Witte is an emeritus professor of political science and public policy at the University of Wisconsin–Madison.

Brian Kisida is an assistant professor in the Truman School of Public Affairs at the University of Missouri.

STATEMENT OF INDEPENDENCE

The Urban Institute strives to meet the highest standards of integrity and quality in its research and analyses and in the evidence-based policy recommendations offered by its researchers and experts. We believe that operating consistent with the values of independence, rigor, and transparency is essential to maintaining those standards. As an organization, the Urban Institute does not take positions on issues, but it does empower and support its experts in sharing their own evidence-based views and policy recommendations that have been shaped by scholarship. Funders do not determine our research findings or the insights and recommendations of our experts. Urban scholars and experts are expected to be objective and follow the evidence wherever it may lead.



500 L'Enfant Plaza SW
Washington, DC 20024

www.urban.org