

The Preliminary Effect of the Louisiana Scholarship Program on College Entrance

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Abstract

The Louisiana Scholarship Program (LSP) is a private school voucher program available to families who have incomes no greater than 250 percent of the federal poverty line and are also in a low performing public school. It began as a pilot program in New Orleans in 2008 and was expanded statewide in 2012. Previous evaluations of the LSP found negative math and English achievement impacts in the first year of the program. By the third year, program effects on achievement were statistically insignificant. In this paper we evaluate the effects of the program on college enrollment for the first cohort of students who are eligible to enter college by 2016-17. Using lottery assignment for a student's first choice private school, we are able to identify the causal effect of being awarded a scholarship on student attainment for nearly 500 randomized students who were in 9th-12th grade during the first year of the program. We find positive but statistically insignificant effects on college entrance for students who attended their first-choice private school. Future analyses will have access to additional grade cohorts of students and therefore hold the prospect of yielding more conclusive results regarding the effects of school voucher programs on an outcome that greatly matter to students.

Introduction

Private school choice continues to be a highly controversial education reform. Choice also remains popular, however, as the number of private school choice programs and participating students has increased rapidly in the last decade (EdChoice, 2018). School choice broadly gives parents the opportunity to select a school for their children other than their residentially assigned public school. Private school choice, in the form of vouchers, tax-credit scholarships, or Education Savings Accounts (ESAs), provides families the opportunity to select a private school for their child and receive financial support to pay for tuition. Milton Friedman (1962) argued that a robust market of schools supported by government resources but managed privately would lead to a more efficient and successful education system. Choice critics contend that education is a public good best delivered by government-run schools (Gutmann, 1987).

Most research evaluating private choice programs has focused on student academic achievement. A majority of experimental evaluations find modest, positive to non-significant effects of private school choice on student achievement (Rouse; 1998; Greene, Peterson, & Du, 1999; Greene, 2001; Krueger & Zhu, 2004; Howell & Peterson, 2004; Howell & Peterson, 2006; Cowen, 2008; Bettinger & Slonim, 2006; Jin, Barnard, & Rubin, 2010; Wolf et al, 2013), with a few notable exceptions that find negative effects on student test scores (Abdulkadiroğlu, Pathak, & Walters, 2018; Dynarski et al., 2017; Mills & Wolf, 2017b). Abdulkadiroğlu, Pathak, and Walters (2018) and Mills and Wolf (2017b) both evaluate the Louisiana Scholarship Program (LSP) and find large negative effects in both math and English Language Arts (ELA) in the first year of the program. Mills and Wolf (2017b) include two additional years of data and find that the negative test score effects diminish in the second year and become statistically insignificant

in the third year of the program. As such, the LSP stands out as the most notable exception to the majority of findings in private school choice research.

In this paper we seek to understand how the LSP impacted college enrollment for students who applied to the program its first year, 2012-13. Using detailed data from the National Student Clearinghouse Student Tracker Service, we find a positive but statistically insignificant increase in college entrance for students who enrolled in their first choice private school through the LSP. We contribute to the emerging body of literature on private school choice programs' effects on student attainment by using an experimental design to estimate the causal effect of the LSP on college entrance. The paper proceeds as follows: first, we define the features and policy context of the LSP; second, we review previous literature on private school choice including that on the LSP; third, we discuss our research methodology and data; next, we present our results; last, we discuss implications of our findings and further research.

Louisiana Scholarship Program Description

The LSP is a voucher program providing students a scholarship to attend a private school of their choice. The program piloted in New Orleans in 2008 and expanded statewide in 2012. Students are eligible if their family incomes are below 250% of the federal poverty line and if they are currently attending a public school rated C, D, or F on the statewide school grading system, entering kindergarten, or are enrolled in the Recovery School District, which is the state government takeover mechanism for Louisiana schools. Students must have been enrolled in a public school prior to applying for a scholarship. Scholarship funding comes from the state and is the lesser amount of 90% of state and local funding or the tuition of the private school of the student's choice. In order to participate in the program, private schools are required to administer

the state standardized test and cannot have selective admission policies. They also must comply with state financial and safety policies.

In the first year of the statewide program, 2012-13, over 9,500 students applied for and 5,296 were awarded a scholarship (Mills & Wolf, 2017a). The majority of students who applied in the first year were in grades K-3 with just over 7% of applicants for 9th-12th grade.

Literature Overview

There is a large body of research evaluating the effects of various private school choice programs on student achievement (Rouse; 1998; Greene, Peterson, & Du, 1999; Greene, 2001; Krueger & Zhu, 2004; Cowen, 2008; Bettinger & Slonim, 2006; Jin, Barnard, & Rubin, 2010; Wolf et al., 2013; Abdulkadiroğlu, Pathak, & Walters, 2018; Mills & Wolf, 2017b; Dynarski et al., 2017). A recent meta-analysis by Shakeel, Anderson, and Wolf (2016) summarizes the effect of private school vouchers around the world and finds statistically significant positive effects on student test scores with larger results in reading; however, the effects are smaller for programs in the United States. In many studies there are heterogeneous effects for various subgroups. For example, in the D.C. Opportunity Scholarship Program, test score impacts are larger for girls and for those who left schools that were not classified as needing improvement (Wolf et al., 2013). A number of studies find greater impacts for African American students (e.g. Howell et al., 2002).

There is a much smaller body of literature on private school choice's effects on students' educational attainment as measured by high school graduation and college enrollment and persistence. Evaluating choice program effects on attainment is more challenging than achievement because it requires following students for many years after their initial experience of the program. However, educational attainment is arguably of more importance than student

test scores as it is associated with a host of positive long-term outcomes. Higher levels of educational attainment are predictive of a longer, healthier, and more economically productive life (Meara, Richards & Cutler, 2008; Muennig, 2008; Belfield & Levin, 2007; Muennig, 2005; Day & Newburger, 2002). Moreover, the achievement effects of a school choice program seldom predict that program's later attainment effects (Hitt, McShane & Wolf, 2018). Achievement and attainment effects from various choice programs gives a more comprehensive understanding of the impact of the program on students' lives.

Literature on Private School Choice and Student Attainment

Seven studies assess the impact of private school choice on student attainment in four programs: Milwaukee Parental Choice Program (MPCP), District of Columbia Opportunity Scholarship Program (D.C. OSP), New York School Choice Scholarships Foundation Program, and the Florida Tax Credit Scholarship (for a systematic review of these studies see Foreman, 2017). Two studies consider high school graduation only (Warren, 2011; Wolf et al., 2013), three consider college enrollment only (Chingos, 2018; Chingos & Kuehn, 2017; Chingos & Peterson, 2015), and two examine both (Wolf, Witte & Kisida, 2018; Cowen et al., 2013). Of the four total studies that consider the effect of private school choice on high school graduation all found statistically significant positive effects. Using an experimental design, the largest impact is in the DC OSP where the effect of using a voucher is a 21 percentage point increase in the likelihood of graduating from high school (Wolf et al., 2013). Using student matching methods, Cowen et al. (2013) find that students participating in the MPCP are two to seven percentage points more likely to graduate high school in four years than similar peers in traditional public schools, an initial finding largely replicated by a follow-up study (Wolf, Witte & Kisida, 2018). Evaluating the same program, Warren, using an observational design, (2011) finds that voucher students are

12 percentage points more likely to graduate in six years compared to the state-wide average graduation rate.

Regarding impacts on college enrollment and persistence, three of the five total studies find significant positive effects for the overall sample. Students participating in the Florida Tax Credit Scholarship are six percentage points more likely to enter college, with most entering community colleges (Chingos & Kuhlen, 2017). Similarly, students in the Milwaukee program are 4-6 percentage points more likely to enter four-year colleges and spend more time there than matched public school students (Wolf, Witte & Kisida, 2018; Cowen et al, 2013). Students in neither the New York City program (Chingos & Peterson, 2015) nor the DC program (Chingos, 2018) realized any significant college enrollment benefits of those private school choice initiatives, though African American and non-immigrant subgroups of students demonstrated school choice attainment impacts in New York.

Overall, private school choice programs tend to have a significant positive effect on student's likelihood of graduating high school and enrolling in postsecondary institutions. However, research is still very limited with only seven studies considering attainment effects, and only three of the seven using a gold standard, experimental design. We seek to expand this literature by experimentally evaluating the impact of the Louisiana Scholarship Program on student's likelihood of entering college.

Previous Literature on the Louisiana Scholarship Program

The LSP is one of the most comprehensively studied private school choice programs. There is evidence on the LSP's impact on: student academic achievement, competitive effects on students who remain in traditional public schools, and school segregation. There is also some

evidence on the types of private schools that participate in the program which may help in understanding the various outcomes of the program.

First, the LSP had large negative effects on achievement for participating students in the first year which ranged from a 0.4 standard deviation (Abdulkadiroğlu, Pathak, & Walters, 2018) to a 0.65 standard deviation decrease in math test scores (Mills, 2015). The effect was smaller in English Language Arts, but remained a statistically significant negative effect. However, these initial negative effects decreased in the second year and became statistically insignificant by the third year (Mills & Wolf, 2017b). The LSP is one of only two voucher programs to show negative test scores effects, the other being the second evaluation of the DC OSP (Dynarski et al. 2018). In both cases the negative test score effects were reported within two years of students switching to private school with a voucher.

It remains unclear why the LSP yielded such negative initial results. They could be due to the disruption of switching schools (especially during the chaotic first year of an initiative), program design, the availability of private schools, or many other factors. Some evidence suggests the supply of private schools participating in the program could be a factor. Sude, DeAngelis, and Wolf (2017) find that only 33% of Louisiana private schools participate in the program. When surveyed, private school leaders listed “Concerns about future regulations” as their main reason for not participating in the LSP (Kisida, Wolf & Rhinesmith, 2015). Louisiana also provides a state tax deduction to parents who self-fund their child’s private education, providing a resource benefit to the state’s private schools that comes with no strings attached (EdChoice, 2018). These prior studies provide possible answers to the atypical pattern of achievement effects we have observed for the LSP but more research is needed to better understand those across years, schools, and students (e.g. Lee, Mills & Wolf, 2018).

Second, Egalite (2016) evaluated the impact the LSP had on student test scores in traditional public schools. Similar to other competitive effects studies, she used multiple measures of private school competition including: distance, density, diversity, and concentration. Using school fixed effects and regression discontinuity models, she finds that students in traditional public schools experienced small gains in math test scores due to competitive pressures from the LSP. The effects were larger in schools that lost more students to private school choice.

Third, the LSP has reduced racial segregation in public schools, especially those under federal desegregation orders (Egalite, Mills, & Wolf, 2016). The effect of school choice on racial stratification in both private and public schools is an increasingly discussed outcome that can have significant consequences for students (for a review of this literature see Swanson, 2017). Egalite and her colleagues find that students who use a voucher to attend a private school tend to leave schools in which their own race is dramatically overrepresented relative to the surrounding community. Students entering private schools are more likely to enter private schools that have a larger proportion of students of their similar race. However, the racial demographics of the private school is more closely representative of the larger community than the public school. On balance, the LSP has decreased racial stratification in Louisiana.

It is difficult to label the LSP as successful or not. There are clear negative effects for student academic achievement in the first year, but those effects appear to have diminished. Moreover, estimates of the test score effects of the LSP are limited to the approximately 15% of all LSP applicants with baseline and outcome test scores and subject to a private school placement lottery. Public schools also seem to have benefited both in terms of higher test scores

and improved racial integration. We add to this literature by evaluating the impact of the LSP on yet another dimension, college entrance.

Research Methodology

Experimental designs are the gold standard for evaluation because they are the most likely of the research designs to identify causal effects. In this study we exploit lotteries in oversubscribed private schools to estimate the causal effect of the LSP on students' likelihood of entering college (Abdulkadiroğlu, Pathak, & Walters, 2018; Mills & Wolf, 2017a; Mills & Wolf, 2017b; Mills, 2015).

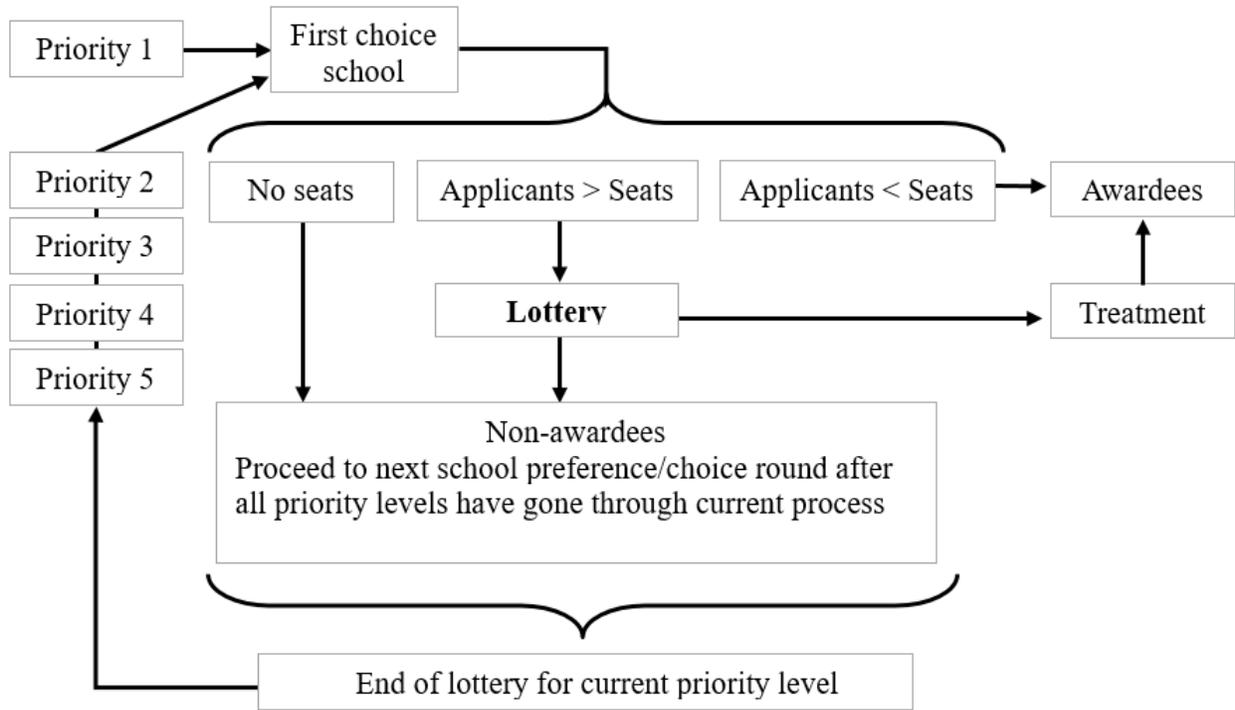
To participate in the LSP, students apply through a centralized enrollment process administered by the Louisiana Department of Education (LDOE). Families are able to rank order their top five preferred private schools. This enrollment system is very similar to New York City Department of Education's public high school choice system (Abdulkadiroglu, Pathak, and Roth, 2005). The LSP enrollment system awards scholarships based on available seats in their preferred private schools and their priority status. Students with disabilities as well as multiple birth siblings (twins, triplets, etc...) are automatically awarded a scholarship if space is available in their desired private school. Remaining students are awarded a scholarship based on priority status.

- Priority 1- students who receive LSP scholarships in the prior school year who are applying to the same school
- Priority 2- Non-multiple birth siblings of Priority 1 awardees in the current round
- Priority 3- Students who received LSP scholarships in the prior school year who are applying to a different school

- Priority 4- New applicants who attend public schools that received a “D” or “F” grade in Louisiana’s school accountability system
- Priority 5- New applicants who attended public schools that received a “C” grade
- Priority 6- New applicants who are applying to kindergarten

Figure 1 summarizes the process of awarding scholarships. The process begins by trying to place all students in priority 1 in their first choice private school. If there are more seats than there are students applying for the specific school, then all students are awarded a scholarship to that given school. If there are no seats available for students in the specific school, no students are awarded a scholarship for that school. If there are more applicants for a school than seats available, scholarships are awarded by lottery. Priority 1 students who were not awarded a scholarship for their first choice school repeat the same process for their second, third, fourth, and fifth choice schools. After Priority 1 students are placed the process repeats for priority 2-6 students. The process continues until all students are awarded or not awarded a direct placement in a preferred private school supported by a scholarship.

Figure 1: LSP Centralized Application Process



Given the allocation process, only a subset of students face a lottery. Using data on student school preferences, we identify if a student faced a lottery when the percentage of students awarded a scholarship falls between 0%-100% for a given priority category, school, and grade combination. We limit our sample to students who faced a lottery for their first choice school (Abdulkadiroğlu, Pathak, & Walters 2018; Mills & Wolf 2017a; Mills & Wolf 2017b; Deming et al., 2014; Bloom & Unterman, 2014). Relying on first-choice lotteries ensures that each awarded scholarship is independent of any other student being awarded a scholarship, within the same priority category.

Data

We use two data sources in our analysis. First, we use student application data for the LSP in the first year of program implementation provided by the LDOE. Second, we use data

from the National Student Clearinghouse (NSC) Student Tracker Service for college entrance. The NSC collects data on entrance, persistence, and degree attainment from nearly all postsecondary institutions in the United States. The NSC database includes 98% of all students enrolled in public or private postsecondary institutions (National Student Clearinghouse). The comprehensiveness of the NSC database allows us to capture records for students in our sample who attend college outside of Louisiana. For this paper we only use data on whether a student entered college as none of the students in our sample has been enrolled long enough to complete a degree. We include both two- and four-year institutions.

A total of 9,809 students applied for a scholarship through the LSP for school year 2012-13 of which 6,599 students faced a lottery for their first choice school (Table 1). For this study, we include students who applied for 9th grade or higher as they are old enough to have entered college by 2017. Our analytic sample contains only students who faced a lottery to gain admission to their first choice private school. Of the 733 students who applied for 9th-12th grade, 456 of them were in a lottery. Students applying for 9th grade make up 57% of our sample while only 3% of our sample are applying for 12th grade.

Our treatment and control groups are very similar at baseline (Table 1). There are no significant demographic differences. The only significant difference between the treatment and control groups is the number of school preferences parents listed on their applications. We control for the number of schools listed on a student's application to correct for this difference. We are not able to test for baseline differences in achievement because students take the statewide standardized test in grades 3-8, so we do not have baseline test score information for about half of our college eligible sample. Overall, we believe that randomization did work

properly and our treatment and control groups do not differ from each other in any systematic way that would bias our estimates.

Table 1: Descriptive data on Experimental Sample and Baseline Equivalence

	LSP		Baseline Equivalence		
	Applicants 2012-13	Experimental Sample	Treatment Mean	Control Mean	T-C
Students applied for scholarship in baseline year	9,809	6,599			
Eligible for college by 2016-17	733	456			
Enroll in college for at least one semester	54%	58%			
Enroll in 4 year institution	47%	47%			
Enroll in 2 year institution	53%	53%			
9th grade	59%	57%			
10th Grade	25%	27%			
11th Grade	12%	14%			
12th Grade	4%	3%			
Female	50%	53%	55%	51%	3%
Black	88%	90%	89%	91%	-3%
White	7%	4%	6%	3%	3%
Hispanic	4%	4%	4%	4%	-1%
Other	1%	1%	2%	1%	1%
Number of School Preferences listed	1.82	1.16	1.76	2.1	-0.34**

Baseline sample includes all students who applied for the LSP for the 2012-13 school year. Experimental sample refers to students who face a lottery for their first choice private schools. For baseline equivalence *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Analytical Strategy

The experimental design allows us to estimate the causal effect of the LSP on college entrance. Because LSP students faced a placement lottery, we estimate the Local Average Treatment Effect (LATE) and not the intention to treat effect (ITT). The LATE also yields a policy relevant estimate because the ITT would compare students who won their first lottery to student who lost their first but may have won a subsequent lottery and attended a private school. The LATE can be interpreted as the effect of receiving a scholarship and enrolling in a student's first choice private school. We calculate the LATE using a two-step process. In the first step we

use a student's lottery assignment to predict the probability of a student enrolling in their first choice school:

$$Enroll_i = \beta_0 + \beta_1 W_i + \gamma_l + \beta_3 X_i + u_{il} \quad (1)$$

where $Enroll_i$ is a dichotomous variable if student i actually enrolled in their first choice school; W_i indicates whether or not student i was awarded a scholarship through the lottery; γ_l is a fixed effect for the specific lottery a student was in which is a combination of their priority category, school, and grade; and X_i is a vector of student characteristics including gender, race, and the number of school preferences on their applications. While student characteristics are not required to identify the causal effect of the LSP on college entrance, they help in more precisely estimating the effect. In the second step (equation 2) we replace the lottery assignment with the predicted probability of enrolling in student i 's first choice school to predict the probability of entering college. $CollegeEntrance_i$ equals 1 if a student enrolled in any college for at least one semester and 0 if a student has never started college.

$$CollegeEntrance_i = \beta_0 + \beta_1 \widehat{Enroll}_i + \gamma_l + \beta_3 X_i + \epsilon_{il} \quad (2)$$

To account for clustering of students within the same school and grade, we use bootstrapped standard errors. We estimate all the models as linear probability models because we have a small sample size for maximum likelihood estimates from a probit or logit to be efficient. Given the number fixed effects in our model, probit and logit models are unlikely to reach convergence around a maximum. Fortunately, the linear predictions of our linear probability models all fall within the appropriate zero to one range.

Results

We find that the LSP has a positive but statistically insignificant effect on college entrance. The treatment group enters college at a higher rate than the control group. Table 2 presents the LATE for students who enrolled in their first choice private school. Column 1 presents the results of the two-step model without any student level covariates. Column 2 presents the results with student covariates. Students who receive a scholarship and enroll in their first choice private school are more likely to enter college by 6.0 to 6.4 percentage points compared to students who did not win a lottery to their first choice school. The estimates are not very precise as the standard errors are about the same size as the point estimate. This is likely due to the relatively small sample size and the demands placed on the data by estimating two-stage analytic models with fixed effects.

Table 2: Effect of Enrolling in a Student's First Choice School on College Entrance

	(1)	(2)
	College Entrance	
LSP Enroll	0.064 (0.064)	0.060 (0.066)
Female		0.159*** (0.045)
Black		-0.201 (0.187)
White		-0.208 (0.190)
Hispanic		-0.166 (0.215)
# of schools listed		-0.031 (0.036)
Observations	456	456
Number of Lotteries	44	44

*Notes: Bootstrap standard errors in parentheses. 400 bootstrap replications were done. All models are linear probability models. Linear predictions fall within zero and one. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Discussion

Contrary to the effects on initial student achievement, the LSP did not seem to statistically affect students' likelihood of enrolling in post-secondary schooling. When considering the achievement effects in year three, our estimated null college enrollment effects is consistent. It is also important to note that students in the achievement analysis are not the same students in our sample. The achievement analysis included students in the baseline year who applied for 4th-8th grade, while our sample includes students who applied for 9th-12th grade. The differences between the achievement and attainment findings could be due to the difference between elementary and high schools.

While the point estimates are insignificant they are positive and similar in magnitude to studies evaluating the effect of private school choice programs in Florida (Chingos & Kuehn, 2017), New York City (Chingos & Peterson, 2015), and Milwaukee (Wolf, Witte & Kisida, 2018; Cowen et al., 2013). It is possible that with the greater statistical power that tends to come from a larger sample, these point estimates would be statistically significant. Fortunately, as time progresses more students who participated in the first year of the LSP will become old enough to enter college. We will also be able to estimate the effect of the LSP on college persistence and degree completion. In the next few years we will more than double our college-age sample, allowing for greater statistical power to detect an effect. With the additional power, we will also be able to identify heterogeneous effects by years enrolled in a private school and various subgroup characteristics. We will also include students who were included in the achievement analysis. There is still a great deal yet to be discovered regarding the effects of the LSP on educational attainment.

Conclusion

We find that the LSP has no statistically significant impact on students' likelihood of entering college if they initially enrolled in grades 9-12 in 2012-13. This finding is particularly interesting given the large negative test score effects students experienced in the first year of the program. The initial academic and attainment outcomes from the LSP seem to conflict with each other, consistent with the tendency for a disconnect between attainment and achievement effects in school choice programs generally (Hitt, Kisida & Wolf, 2018). Evaluations of the Washington D.C. Opportunity Scholarship Program (Wolf et al., 2013) and the Milwaukee Parental Choice Program (Wolf, Witte & Kisida, 2018; Witte et al., 2014; Cowen et al, 2013) both found marginal to null test score effects but large statistically significant increases in high school

graduation rates due to private school choice. Evaluations of the Boston charter schools (Angrist, et al. 2014), Harlem Promise Academy (Dobbie and Fryer, 2014), KIPP charter schools (Tuttle, et al., 2015), and the SEED Boarding Charter school (Unterman, et al., 2016) find significant increases in student test scores but no increase in high school graduation or college entrance.

Our evaluation is the first rigorous private school choice study to find negative test score effects and positive but null college entrance effects. The pattern in the literature seems to suggest that schools affect students in positive ways that are not always detected in standardized tests. It could be that private schools of choice have more of a comparative advantage over public schools in developing the non-cognitive skills of students, including grit, persistence and conscientiousness. Those character skills likely increase the probability that a student continues with higher education even if they haven't gained more knowledge from attending a private school than their public school peers. While the actual reason for the achievement-attainment disconnect in school choice evaluations is unknown, it seems to be a prevalent pattern that deserves further consideration.

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