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A RANDOMIZED IMPACT EVALUATION OF A TUITION-FREE PRIVATE SCHOOL TARGETING LOW INCOME STUDENTS IN URUGUAY

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Using a randomized trial, we evaluate the impact of Liceo Jubilar, a tuition-free private school providing middle school education to poor students in Montevideo, Uruguay. The research compares adolescents randomly selected to enter the school with those not drawn in the school lottery. Several features of this school — the capacity to select personnel, a culture of high expectations, a safe and disciplined environment, differential teaching, extended instructional time, strong parental involvement, and a rich offer of extracurricular activities — contrast with the country's highly centralized public education system. We find large positive impacts of Liceo Jubilar on students' promotion rates and academic expectations. Our results shed light on new approaches to education that may contribute to improve opportunities for disadvantaged adolescents in developing countries.

JEL classification codes: C93, I21, I25, I28
Key words: experimental evaluation, privately-managed education, poverty

I. Introduction

The low quality of public schooling has been pointed out as one of the main barriers limiting the expansion and quality improvement of secondary education in the developing world (Di Gropello 2006). In Latin America, despite significant expansions in access to secondary education in the past decades, low quality and high dropout rates remain a critical challenge. Almost half of Latin American

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adolescents drop out of school at some point during the secondary education cycle and nearly half of the 15 year olds in the region have difficulties mastering the most basic numeracy and reading skills (Graduate XXI 2013, Aristimuño and de Armas 2012). These problems are not unique to Latin America. Other low-income countries in Africa and Asia that participate in international tests show deficits that put their median child at the bottom 15th percentile of children from richer countries (Andrabi, Das and Khwaja 2015).

Two main trends have emerged in developing countries as a response to the low quality of public education: decentralization of public education and an increase in private-sector provision (Bruns, Filmer and Patrinos 2011). In this paper we shed light on the second development by evaluating an innovative education model that emerged in Uruguay in the early 2000's and that has been recently replicated in other regions of the country. Liceo Jubilar is a middle school that provides tuition-free schooling to low-income students in one of the poorest neighborhoods in Montevideo. It is financed by individual donations as well as corporate donations that are in return exempted from the payment of corporate income tax. The school has limited independence to innovate over academic contents, and does not differ from public schools in the observable quality or remuneration of the teachers. However, it operates over an extended academic schedule, has freedom to selectively hire personnel, uses differential teaching, provides an environment of discipline, safety, and belonging, and shows a strong involvement with the community.

Our impact assessment is based on the randomization of the students who applied to enter Liceo Jubilar by the end of primary school (sixth grade) in 2009. Our research design exploits the excess of applicants over the school capacity and the fact that participants were selected randomly. The lack of national level standardized tests in Uruguay makes the evaluation very costly, as we have to apply the cognitive tests, a task particularly expensive in the case of control subjects. This explains why only the lottery of one year is used. At one-year follow-up, we find that the intervention reduced significantly repetition and dropout rates, and had a positive impact on the students' expectations of completing college.[1] We are unable to find statistically significant differences in academic achievement,

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[1] We are in the process of analyzing third year outcomes.

although this failure is likely due to a poor testing instrument. On the basis of administrative data on the school and survey data on students' experiences and perceptions, we hypothesize about potential channels behind the observed effects. A smaller school, increased instructional time, higher peer quality, students' perception of discipline and respect, parental involvement with the school, and a committed staff, are among the underscored features.

This study has several strengths. It is one of a few investigations to analyze an innovative private education initiative in Latin America using an experimental design. Furthermore, it assesses a variety of outcomes that include not only the usual measures of academic achievement, such as promotion and dropout rates, but also effects on students' and parents' perceptions on safety, discipline, and belonging. These outcomes may be important for parents when choosing a school, but are typically overlooked. The study faces also several limitations, including the small sample size, the fact that the effects correspond to just one school, and the difficulties in measuring effects on learning outcomes. Overall, we consider that the paper sheds new light on a highly policy relevant area and thus makes a contribution to the existing literature.

II. Background

A. Evidence on privately managed schools

In response to public schools' low academic performance, governments are increasingly experimenting with policies that cede centralized control of schools to private providers. Private management of public education has been implemented with varying intensity in countries such as Chile, Colombia, the Netherlands, New Zealand, Sweden, Spain, and the United States.

Most of the evidence on privately managed schools comes from charter schools in the United States. Charter schools are autonomous institutions founded by teams of teachers, parents, and nonprofit organizations that receive public money in exchange for concrete educational outcomes (Toma and Zimmer 2012). They cannot charge tuition and are not permitted to impose admission requirements, and must select students by lottery if oversubscribed. A recent review by Epple, Romano and Zimmer (2015) shows mixed evidence of charter schools' impacts. Results from fixed-effects studies, based on students switching to charter schools from public schools or vice-versa, suggest small, null, or even negative effects

on students' academic achievements. Findings from randomized control trials, on the other hand, are in general more supportive of charter schools and show in some cases large academic effects (Abdulkadiroglu et al. 2011; Angrist et al. 2002; Hoxby and Rockoff 2005; Hoxby, Murarka and Kang 2009; Dobbie and Fryer 2011a; Wong et al. 2014). Moreover, these positive results do not seem to be a function of the type of students applying to these schools (Angrist, Pathak and Walters 2013). In addition, charter schools appear to improve behavioral outcomes and long-term outcomes such as high school graduation, college attendance and completion, and earnings (Dobbie and Fryer 2013; Wong et al. 2014; Booker et al. 2014).

Many of the oversubscribed schools that undergo experimental evaluation and show large effects respond to the so-called "No Excuses" model. These schools are characterized by a small size, frequent testing, a long school day and year, selective teacher hiring, a strong student workload, and the imposition of strict discipline (Abulkadiroglu et al. 2011). Qualitative and quantitative evidence on charter networks such as KIPP, Harlem Children's Zone, and Success Academy (Angrist et al. 2010; Dobbie and Fryer 2011a; Dobbie and Fryer 2011b; Taylor 2015), as well as some interventions that inject "No Excuses" strategies in public schools (Fryer 2014) suggest that the learning effects in these schools are related to the substantial pressure on students, teachers and parents regarding academic outcomes and expected behaviors.

The evidence on privately managed schools in Latin America is scarcer. Observational studies on Fe y Alegría schools, a religious denominational network present in 16 Latin American countries,[2] show that students in these schools achieve higher academic outcomes than comparable low-income students in public schools (Alcázar and Valdivia 2005; Allcott and Ortega 2009; Osorio and Wodon, 2010). Another private contracting experience, the "Concession Schools" in Bogotá, Colombia, also shows evidence of positive results for low-income students in standardized tests and school completion rates (Barrera-Osorio 2007).

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[2] Fe y Alegría schools share a strong commitment with the community and a sense of belonging with the organization. They promote parental involvement with the school and complement their academic approach with extracurricular activities. Teachers in these schools are observationally similar to teachers in public schools. However, they start with a one year trial contract and are willing to be trained, tutored, and evaluated by more experienced teachers in school (Alcázar and Valdivia 2005).

The program gives well-established, private providers the concession of schools in low-income areas. Principals are allowed certain independence in the selection of personnel and complete freedom in the choice of the pedagogic model. In both school approaches, better academic achievement has been attributed to community involvement, extracurricular activities, labor contract flexibility, and a decentralized administrative structure.

A third piece of evidence in Latin America is linked to the voucher experiences in Colombia and Chile. In these countries, governments distribute vouchers that partially finance the costs of education, giving low-income students the opportunity to attend private schools. Randomized evaluations of the Colombian experience show significant impacts of vouchers on academic outcomes, both in the short run, as captured by lower repetition rates, as in the long run, through better results in college admission tests and higher wages (Angrist et al. 2002; Angrist, Bettinger and Kremer 2006). Positive results have been attributed to the effects of competition and higher accountability on the quality of participating schools and to the stronger incentives faced by the students, as vouchers are only renewable upon the achievement of academic success. In the case of Chile, some authors report positive results on test scores and pre-college admission tests, and others find no average differences with public schools (Gallego 2005). Catholic schools appear to fare better than other private schools.

In terms of other developing regions, Muralidharan and Sundararaman (2013) report findings of an experimental evaluation of a voucher program in the Indian state of Andhra Pradesh. They do not find evidence of better results in math or Tuguru (the local language), but find improved outcomes in English, Hindi, social studies, and science, disciplines in which these private schools spend more hours. These gains are attained, in addition, at lower costs than the public alternative. Kim, Alderman and Orazem (1999) evaluate the Quetta Urban Fellowship Program, a program paying subsidies per girl enrolled directly to new private primary schools with female teachers established in poor urban areas in Pakistan. They find substantial increases in girls' enrollment and also lower costs of the fellowship school relative to government schools.

B. Liceo Jubilar

The school under evaluation, Liceo Jubilar, is a tuition-free privately managed middle school in Montevideo that offers middle education to students below

the poverty line.[3] After its inception in 2002, several other private schools have emerged following the same model. The school is financed with donations from individuals and corporations that are exempted from corporate income tax. This exemption operates in practice as an indirect source of government funding. Specifically, for every corporate donation of $100 to a privately managed school, the firm ends up paying $18.75 and the government provides $81.25 in the form of resigned taxes.[4] The school also receives some direct funding from the government (National Institute of Children and Adolescents, INAU) to finance extracurricular activities. Parents are required to contribute financially within their means, but these contributions are insignificant.

Liceo Jubilar is located in Casavalle, one of the poorest neighborhoods in Montevideo, with an adolescent poverty rate of almost 75% and a high school completion rate of 8% in 2009 (Uruguayan Household Survey). Students are taught the national school curriculum in the mornings, and are required to take extracurricular courses and to choose among several instructional and recreational workshops in the afternoons. For the school to be credited by the National Education Authority, it must comply with the subjects, contents, time assignments, and schedules of the national curriculum. This implies that the school does not differ from public schools in terms of its academic content. Liceo Jubilar has a catholic religious affiliation, but participation in religious activities is voluntary for the students.

Regarding traditional school inputs, Liceo Jubilar is much smaller than the regular average school. The size of a cohort is 70 in Liceo Jubilar versus 382 in public schools and the full size of the school is 210 students. On the other hand, the average class size in Liceo Jubilar is larger than in comparable schools (35 vs. 31 students per class). Another difference is the length of the school day and year. Students in Liceo Jubilar spend 2.6 more hours per day at school than control subjects (whose average is 6).[5] According to administrative data, the length of

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[3] The school's website is www.liceojubilar.edu.uy.

[4] A corporate donation of $100 to a privately managed school gets in return $75 in tax certificates from the government that can be used to cancel tax obligations. The remaining $25 can be deducted as expenditure in the filing of the corporate income tax. The regime holds as long as the donation does not exceed 5% of the firm's profits if the firm is a first time donor, or 10% if she has donated before.

[5] A small fraction of public school students attends after-school programs financed by the government, which also offer academic support and/or extracurricular activities.

the academic year is 210 days in Liceo Jubilar, 20% above the academic year in regular public schools. Students attending Liceo Jubilar also spend less time than control students travelling from home to school: it takes them on average 6 minutes less to get to school daily, compared to 18 minutes on average for the control group subjects. This difference can be explained by the school's policy of excluding applicants that do not live in the neighborhood and by the insufficient supply of public schooling options in the neighborhood. On the other hand, Liceo Jubilar' criterion of not allowing applications of students exceeding their grade-appropriate age by more than one year, ends up affecting differentially the peer body of treatment and control subjects. Students in the treatment category share a student body that is better accomplished in terms of academic development. In the assessed public schools, the fraction of students exceeding the grade appropriate age by 1 year is 28% and the fraction exceeding the grade appropriate age by 2 or more years is 32%. For Liceo Jubilar, these rates are 20% and 0% respectively.

Liceo Jubilar is closely involved with the community. Parents are required to participate in at least one committee (cleaning, school maintenance, meals, outings) throughout the year, and at least one adult in the family is expected to be accountable for the student's behavior and academic development. This involvement contrasts with parents' committees in public schools, which have low rates of participation and can barely participate in school daily activities. Finally, and unlike public schools, Liceo Jubilar can selectively hire and dismiss teachers, and can assign teachers' workload flexibly to teaching, coordination, and training.[6]

III. Methodology

Ever since its inception, average dropout and repetition rates have been below 2% in Liceo Jubilar, compared to an average repetition of 26% in the school's neighboring area and less than 40% of adolescents attending school after the age of 15 (INE 2009). This simple comparison of means is likely to capture not

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[6] In public schools, principals are not able to select their staff. Public school teachers select the schools they want to work in once a year on the basis of seniority and some qualifications. The principal cannot intervene in this choice. As public employees, teachers are also very difficult to fire. Due to this dynamic, problematic public schools (in particular those with a high fraction of disadvantaged students) end up disproportionately with unqualified young teachers, and experience high staff rotation.

only Liceo Jubilar's impact, but also differences in the baseline characteristics of the populations compared (selection bias). For example, public schools are more likely to enroll students of higher socioeconomic status than Liceo Jubilar, suggesting a negative selection bias. On the other hand, students who apply to Liceo Jubilar probably exceed other youth of similar socioeconomic status in terms of their motivation, perception of the value of education, and family support. This feature could bias the impact estimates upwards if selection bias were not adequately addressed. We overcome selection problems by exploiting the fact that the number of subscriptions for Liceo Jubilar exceeds the placements available, and that students are selected by lottery. This allocation rule ensures that the group of students randomly assigned to enter Liceo Jubilar is similar at baseline to the group of adolescents not drawn in the lottery.

A. Data collection

In September 2009, Liceo Jubilar opened an enrollment window inviting families of children in the last year of primary school to apply for a placement at the school. The school had 70 places available (two classes of 35 students). Applications were received from 172 students, 43 of which were rejected because they exceeded the grade-appropriate age by two years or more, did not live in the neighborhood, or had a household income above the poverty threshold. Out of the remaining 129 applications, 28 students were automatically chosen to enter the school, primarily because they were siblings of current or former students. This left a remaining waiting list of 101 candidates who were randomly assigned to meet the quota of 42 places in December 2009.

Randomization was stratified on the basis of gender, two categories of household income (high and low), and two categories of achievement in the Liceo Jubilar's baseline placement test. Before the lotteries were drawn in November 2009, the applicants completed a baseline self-administered survey at Liceo Jubilar. The questionnaire inquired about demographics, academic performance, academic expectations, risky behaviors, and habits. An additional survey was administered by school staff to parents or family referents, covering family structure, education, income, and occupation, among other socioeconomic characteristics.

Table 1. Descriptive statistics at baseline

	Randomized candidates	Excluded candidates	Candidates selected a priori	Households w/children ECHO9 [2]	Difference (2)-(1)	Difference (3)-(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Demographic characteristics						
Age	12.259	12.708	12.215		0.449***	-0.045
Male	0.450	0.512	0.577		0.062	0.127
Academic indicators						
Preschool	0.733	0.621	0.714		-0.112	-0.018
Public primary	0.707	0.719	0.692		0.012	-0.015
After-school programs (if public sch)	0.313	0.382	0.308		0.069	-0.005
Good/excellent student	0.460	0.235	0.423		-0.225**	-0.037
Average/regular student	0.440	0.618	0.500		0.178**	0.060
Bad student	0.100	0.147	0.077		0.047	-0.023
Repeated at least one grade	0.170	0.349	0.077		0.179***	-0.093
Results from pre-test	4.802	4.421	5.680		-0.381*	0.878***
Less than 4 in pre-test	0.396	0.526	0.200		0.130*	-0.196**
Religion						
Catholic	0.500	0.176	0.423		-0.324***	-0.077
Other religions	0.071	0.088	0.115		0.017	0.044
Household environment						
Number of people at home	4.460	4.412	5.231	4.157	-0.048	0.771**
Both parents at home	0.560	0.676	0.577	0.629	0.116	0.017
Only one parent at home	0.190	0.176	0.077	0.367	-0.014	-0.113
House owner	0.571	0.600	0.654	0.568	0.029	0.082
Parents' education: primary only	0.303	0.400	0.308	0.058	0.097	0.005
Parents's education: < high school	0.566	0.467	0.577	0.630	-0.099	0.011
Parents' education: high school grad	0.131	0.133	0.115	0.312	0.002	-0.016
Head of houshold works	0.949	0.933	0.885	0.810	-0.016	-0.065
Household income (2010 US$)[1]	605.4	766.6	541.0	1574.1	161.2***	-64.4
Durable goods index	0.319	0.306	0.292	0.383	-0.013	-0.027
Cash transfers from government	0.495	0.467	0.615	0.613	-0.028	0.120
Max N	100	43 [3]	26	18648		

Notes: * statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%. [1] The exchange rate in 2010 was 20 Uruguayan pesos per US dollar. [2] ECHO9 is the Uruguayan Household Survey for 2009, administered by the National Institute of Statistics. [3] For some characteristics of the excluded candidates, N decreases substantially.

Table 1 shows descriptive statistics for the group of adolescents subject to the lottery, for adolescents excluded a priori from the selection process, and for students who were directly admitted to enter Liceo Jubilar. In addition to analyzing differences between these groups, we compare the household characteristics of the students participating in the lottery with those of a nationally representative sample of households with children aged 18 or less (Uruguayan Continuous Household Survey, INE 2009).

Column (1) shows that the average age of students who participated in the lottery was 12 in December 2009. The fraction of boys was 45%. Seventy percent had attended primary public school while the rest had gone to highly subsidized private schools in the neighborhood. Almost 40% showed poor academic performance in the school's placement exam. Half of the children reported being Catholic, 7% claimed other faiths, and the rest reported no religious beliefs. Over 50% of children lived with both their parents at the time of the initial survey, about 20% lived only with their mother, and the rest lived with their mother and stepfather, or with their mother and other relatives. Only 5% of household heads reported not working. The average monthly household income was $12,100 Uruguayan pesos (2010 currency), approximately $605 US dollars. A high proportion of households were recipients of social benefits that included cash transfers and a food card.

Column (2) shows descriptive statistics for adolescents excluded from the selection process, and column (5) reports the differences between this group and those subject to the lottery.[7] The Table shows that those excluded from the selection process were on average half a year older than lottery participants, were less likely to be good or excellent students according to their self-reported GPA for 5th grade, their likelihood of having repeated a year was 5 times higher than that of the group subject to the lottery, and the result of the placement examination was on average 10% lower. These adolescents also showed a lower likelihood of being catholic and had higher family incomes.

Column (3) depicts the same variables for those who entered Liceo Jubilar without going through the lottery. When compared with the group subject to the lottery (see differences in column (6)), these students show a better performance in Liceo Jubilar's placement examination but do not show statistically significant

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[7] We could only complete 34 surveys out of 43 in the group not satisfying the inclusion criteria. The information presented in Column (2) is thus a subsample of the full group.

differences in other variables. Because most of those entering the school without a lottery are siblings of past students, these better results may reflect positive spillovers of these past students and their parents on entering students. It also raises the issue of the quality of the peer group: students randomly selected to enter Liceo Jubilar are facing a better quality peer group than those not selected.

Column (4) shows average household characteristics for families with at least one child aged 18 or less in a nationally representative sample obtained from the 2009 Uruguayan Continuous Household Survey. Families of applicants to Liceo Jubilar are larger and less likely to be intact than the average Uruguayan family with children. Families of the randomized students also show lower levels of education and income. The percentage of household heads that did not complete primary school was 30% in the sample of students participating in the lottery versus 6% in the nationally representative sample. Regarding income, families applying to Liceo Jubilar reported an average monthly income of $12,000 Uruguayan pesos (US$ 600) versus $31,000 (US$ 1,500) in the sample representative of Uruguayan households with children. These income levels place the families applying to Liceo Jubilar in the 15th percentile of the country's income distribution. On the other hand, household heads in the sample subject to randomization are more likely to work and less likely to receive transfers from the government.

Table 2 shows descriptive statistics for adolescents selected by lottery to enter Liceo Jubilar in March 2010 (treatment group) as well as non-drafted applicants (control group). As expected because of the randomized selection design, treatment and control subjects did not differ significantly in their baseline characteristics.

A first-year follow-up round was conducted in November-December 2010. The assessment included a home interview that inquired about academic achievement, perceptions about school, use of time, values, satisfaction and expectations, and health status; a self-administered questionnaire with sensitive questions on crime and delinquency, substance use, and sexual behavior; and a brief parent questionnaire regarding parental beliefs about the school and updates on socio-demographics.

In addition, study subjects participated in a Math and Spanish standardized test. These tests had been designed by the Uruguayan Public Education Authorities (Asociación Nacional de Educación Pública 2010) using publicly released items from the Program for International Student Assessment (PISA) and had been administered to students in a sample of 36 public middle schools in 2009. Finally, the adolescents were contacted by phone at the beginning of the new school year (end of March 2011) to inquire about final promotion outcomes and current school attendance.

Table 2. Mean comparison of baseline characteristics. Group subject to randomization

	Treatment [1]	Control [2]	Difference	Std. error	N
	(1)	(2)	(3)	(4)	(5)
Demographic characteristics					
Age	12.291	12.235	0.056	(0.098)	95
Male	0.419	0.474	-0.055	(0.101)	100
Academic indicators					
Preschool	0.769	0.702	0.067	(0.096)	86
Public primary	0.721	0.696	0.025	(0.093)	99
After-school programs	0.349	0.286	0.063	(0.095)	99
Good/excellent student	0.535	0.404	0.131	(0.101)	100
Average/regular student	0.372	0.491	-0.119	(0.100)	100
Bad student	0.093	0.105	-0.012	(0.061)	100
Repeated at least one grade	0.162	0.175	-0.013	(0.076)	100
Results from pre-test	4.929	4.704	0.225	(0.311)	96
Less than 4 in pre-test	0.349	0.404	-0.055	(0.098)	100
Religion					
Catholic	0.559	0.455	0.104	(0.102)	98
Other religions	0.070	0.073	-0.003	(0.053)	98
Household environment					
Number of people at home	4.465	4.456	0.009	(0.309)	100
Both parents at home	0.558	0.561	-0.003	(0.101)	100
Only one parent at home	0.163	0.211	-0.048	(0.079)	100
House owner	0.190	0.125	0.065	(0.076)	98
Parents' education: primary only	0.628	0.518	0.110	(0.100)	99
Parents' education: high school grad	0.116	0.143	-0.027	(0.068)	99
Head of houshold works	0.814	0.786	0.028	(0.082)	99
Household income (in 2010 US$)[3]	566.1	635.1	-69.1	(57.3)	100
Durable goods index	0.343	0.301	0.042	(0.036)	100
Cash transfers from government	0.488	0.500	-0.012	(0.102)	99

Notes: * statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%. [1] Treatment subjects are students randomly selected to enter Liceo Jubilar. [2] Control subjects are students that participated in the lottery but were not drafted. [3] The exchange rate in 2010 was 20 Uruguayan pesos per US dollar.

B. Sample size and attrition

The analyzed cohort of students consists of 100 participants, 42 in the randomly selected group and 58 in the control group.[8] Two students in the control group failed to answer the household survey. In addition nine students in the control group and two in the treatment were missing information on some of the questions about school climate and school characteristics. This differential pattern of responses across treatment status is statistically significant. Still, a comparison of baseline characteristics across treatment status for subjects with non-missing responses shows that this restricted sample is balanced (see Appendix, Table A1), suggesting randomness in missing responses. For consistency, we run our analysis considering only those with non-missing values in the household survey (N=87). Finally, six subjects in the control group and one in the treatment group did not participate in the Math and Spanish tests. This difference in attrition is statistically significant at a 6% level. In Table A2 in the Appendix we show that there are no statistically significant differences in baseline characteristics between treatment and control subjects that completed the tests (N=93).

C. Impact evaluation

The analysis in this paper compares one-year outcomes for treated subjects versus control subjects. All subjects in the control group ended up attending public schools when not drafted.[9] These schools are the yardstick against which we are comparing Liceo Jubilar's outcomes. Two public schools concentrated 40% of the control group's enrollment; all other control adolescents were distributed across 13 other public schools.

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[8] One of the 101 original observations refused to participate in all instances of the study.

[9] We can think of several reasons why none of the students in the control group attended a private secondary school, despite having attended private schools during primary education. First, in 2010 there were three private primary schools in the neighborhood but only one secondary school, Liceo Jubilar. Second, one of the private elementary schools, attended by half of the private school students, was supported by a foundation that provides private school scholarships to students in poverty. We are not aware of any similar program at the time going on at the middle school level. Third, private secondary education is usually more expensive than elementary education. The population that applies for a placement at Liceo Jubilar is among the poorest in the nation and unlikely to be able to afford a private school. Most of those going to a private school during the elementary stage had probably been awarded scholarships. Distance from other private secondary schools appears as an additional barrier to access this option.

The main academic outcomes to be compared are enrollment, progression, school attendance, and standardized tests results. We also consider students' expectations about future education and perceptions of school safety, discipline, and belonging as relevant outcomes.

The simplest way to estimate the average treatment effect is by conducting a regression of each outcome on the coefficient of the treatment dummy, i.e., a dichotomous variable that takes the value of 1 if the adolescent attended Liceo Jubilar and 0 otherwise. However, one of the participants initially selected to enter Liceo Jubilar ended up not attending the school and two subjects from the control group ended up attending. Thus, the group of those that were finally treated differs slightly from those initially selected to be treated (the Intention to Treat or ITT group). A simple Ordinary Least Squares (OLS) regression using effective treatment as the explanatory variable of interest may introduce bias if selection into and out of the treatment group is not random. We thus use the indicator of random selection into treatment (ITT) as the relevant explanatory variable, and refer in the text and tables to "treatment" as those with ITT=1 and "control" as those with ITT=0. In a robustness check, we run adjusted regressions and instrumental variables regressions using the ITT indicator as an instrument for effective participation. All standard errors are robust to heteroscedasticity.

One concern when conducting randomized experiments is the possibility of contamination across subjects in the different treatment categories. The fact that subjects in treatment and control groups live in the same neighborhood could raise concerns about an indirect effect on control adolescents through friendships with Liceo Jubilar's students. While the existence of those spillovers would underestimate the true effect, we believe it to be unlikely. Due to the extended number of hours that students spend at school and to the different cultures between Liceo Jubilar and the public system, most students in Liceo Jubilar end up hanging out with their school peers.

Another potential source of bias would arise if students in Liceo Jubilar entered the school with previous spillover effects through older siblings (and indirectly, through their parents). In our study, students with siblings in Liceo Jubilar were automatically accepted at school and did not participate in the lottery. This strategy minimizes the risk of this other type of contamination.

D. Costs

We compute running costs per student for the academic year 2010 on the basis of data provided by the school (see Appendix, Table A2). All costs are in 2010 US dollars. The academic staff is reimbursed at rates similar to those paid in public school. The annual cost of the academic and technical staff (which includes the school administrators, academic coordinators, teachers, a psychologist, and a social worker) is $ 1,113 per student. Utilities and other services account for an additional $ 488 per student.

Regular activities in the afternoon include music, cooking, crafts, dancing, sports, a reading club, and remedial education or tutoring. All afternoon activities are led by unreimbursed volunteers. To attach a price to these services, we computed the number of hours for each volunteer and imputed a market price per hour to the activity. We also considered the time cost of individual volunteers involved in non-regular activities, such as aid with enrollment or end of the year activities, and the cost of school trips and outings. The total annual cost of extracurricular activities is $ 973 per student.

Other resources include books, uniforms and other school supplies offered to students free of charge, free breakfasts and lunches, and parental time in school committees. Because most of these items are donated in-kind, we computed their opportunity cost taking into account market prices.[10] Our estimates indicate these items amount to $ 799 per student per year.

According to the above estimates, the total running cost for the school in 2010 was $ 3,373 per student. This number fails to capture other opportunity costs, such as the cost of infrastructure, non-regular in kind donations and activities aimed at improving adult education or promoting links with the community. On the other hand, some of the resources accounted for above (such as coordination and management hours, utilities, and other services) are also allocated to parallel ongoing programs, specifically alumni support and community workshops, which should be subtracted from the aggregate estimate.

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[10] We assigned each volunteer an hourly wage corresponding to the activity the subject was developing at the institution. This wage was computed by taking into consideration the hourly prices paid by the school for similar activities.

IV. Results

A. Educational outcomes

Table 3 shows the estimates of treatment status on 1st year students' educational outcomes. Each row depicts an outcome. The first and second columns show mean values for treatment and control subjects. Columns (4) and (5) display, respectively, the difference across treatment status, and its heteroscedasticity-robust standard error. The last column displays the number of observations.

Table 3. Effects on educational outcomes

	Treatment [1]	Control [2]	Difference	Std. error	N
	(1)	(2)	(3)	(4)	(5)
Enrollment, assistance and progression					
Enrollment: Enrolled in 2011	1.000	0.965	0.035	(0.025)	100
Progression: Enrolled in second grade in 2011	0.976	0.789	0.187***	(0.059)	100
Abandoned school before the end of 2010	0.000	0.088	-0.088***	(0.008)	100
% days absent in 2010	0.037	0.057	-0.019**	(0.014)	93
Academic achievement					
Test scores in Math	0.040	-0.033	0.073	(0.206)	93
Test scores in Spanish	0.162	-0.133	0.295	(0.211)	93
Average academic achievement	0.066	-0.055	0.121	(0.207)	93

Notes: # statistically significant at 10%; * statistically significant at 5%; *** statistically significant at 1%. [1] Treatment subjects are students randomly selected to enter Liceo Jubilar. [2] Control subjects are students that participated in the lottery but were not drafted.

Results show that the intervention did not affect enrollment in school one year after the initiation of the intervention. Yet, treatment status significantly affected progression in school: 98% of treated subjects were promoted to second grade, versus 79% of controls, a difference of 18.7 percentage points. Part of this difference has to do with Liceo Jubilar's ability to retain students during the year. Students in Jubilar had a lower likelihood of quitting school before the end of the year by 8.8 percentage points in 2010, a decrease of 100% relative to the quitting rate in the control group. Most quitters were female and most of them reported

informally they had abandoned school because of violent or unsafe incidents. The lack of statistically significant differences in enrollment in 2011 shows that school abandonment in 2010 was transitory: most of the quitters re-enrolled in school in 2011. This behavior is quite expected, considering that low socioeconomic status families receive cash transfers that are conditional on school enrollment, but not on school attendance. Although not depicted in the table, repetition rates were smaller by a statistically significant magnitude in Liceo Jubilar even without considering those who abandoned school. Finally, treated students were less likely to be absent during the year in spite of a longer school year.

Regarding cognitive skills, treatment subjects had slightly higher scores in Math and Spanish, but these differences were not statistically significant. The administered tests were too noisy and the sample size too small to identify differences across treatment and control subjects. Recall that these tests were elaborated by the Uruguayan Public Education Authorities on the basis of publicly released PISA items, and were administered to 36 public middle schools in Uruguay in 2009. While they were in principle designed to test Math and Spanish levels for the Uruguayan 13 year old population, performance was very poor even for the public education sample. The average rate of correct answers was 30%, suggesting a poorly designed test with low discriminating power. The fraction of correct responses among our sample was 27%.

B. Educational expectations and perceptions on school climate

The following results, displayed in Tables 4 and 5, are restricted to 87 subjects that were administered the household survey and that had non-missing responses in a set of selected outcomes. Table 4 reports treatment effects on educational expectations and perceptions on school climate and Table 5 shows differences by treatment status in parental involvement and extracurricular activities. All students abandoning school before the end of the academic year were excluded because they did not answer questions inquiring about school characteristics and climate. Assuming that school dropouts would in principle have worse expectations, perceptions, and school involvement, our estimates would be conservative.

Table 4. Effects on educational expectations and perceptions on school climate

	Treatment [1]	Control [2]	Difference	Std. error	N
	(1)	(2)	(3)	(4)	(5)
Educational expectations					
Student expects to complete college	0.585	0.304	0.281***	(0.104)	87
Parent expects child to complete college	0.659	0.435	0.224**	(0.105)	87
Perceptions on school climate					
Safety 1 - Student feels safe at school	1.000	0.870	0.130**	(0.050)	87
Safety 2 - Parent thinks student is safe at school	0.976	0.674	0.302***	(0.074)	87
Discipline 1 - Climate of respect and discipline at school	0.902	0.587	0.315***	(0.087)	87
Discipline 2 - Conflicts solved without fights or threats	0.805	0.348	0.457***	(0.095)	87
Discipline 3 - Suspensions from school in 2010	0.000	0.152	-0.152***	(0.054)	87
Belonging 1 - Student feels happy at school	0.976	0.848	0.128**	(0.059)	87
Belonging 2 - Student talks to educators about concerns	1.000	0.957	0.043	(0.030)	87

Notes: * statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%. Regressions are run on the sample of home interview respondents with non-missing items. [1] Treatment subjects are students randomly selected to enter Liceo Jubilar. [2] Control subjects are students that participated in the lottery but were not drafted.

The results in the first two rows of Table 4 show treatment effects on students' and parents' expectations about future education. Treatment status is associated with an increase of 28 percentage points (p.p.) in a student's expectations of completing college, almost double the expectations of the control group. There is also evidence that the treatment increased parents' expectations about their children's likelihood of completing college: the difference by treatment status is 22 p.p., significant at a 5% level.

In terms of school climate, both students and their parents perceive that Liceo Jubilar offers a safer environment. We already mentioned anecdotal evidence that pointed to safety as one of the critical issues behind school abandonment. Students in the treatment group are 13 p.p. more likely to feel safe at school than comparison students, and parents of these students are 30 p.p. more likely to think their child is safe at school. Both effects are statistically significant at a 5% level. There are striking differences in perceptions of discipline by treatment status. Treated students are 32 p.p. more likely than control subjects to believe that

"students in their school respect the teachers and staff, and that there is a disciplined environment". Furthermore, only 48% of control subjects believe that students in their school can resolve conflicts without fights, offenses, or threats. The rate among treatment school students is 81%. The data also reveals a higher rate of suspensions from school for control students, suggesting either more tolerance on the part of Liceo Jubilar or that students tend to misbehave more in less disciplined environments. All these "discipline" effects are statistically significant at a 5% level. In terms of school belonging, a higher fraction of treatment subjects reports feeling happy at school: attending Liceo Jubilar increases this perception by 13 p.p., from a baseline rate of 85%.

The large differences in students' and parents' perceptions, plus the fact that many of the perceptions are close to 100% for treatment subjects raises the issue of family preferences for schools and the degree to which parents value factors such as discipline and safety, in addition to academic achievement, in their schooling choices.

C. Parental involvement and extracurricular activities

Table 5 explores effects on parental involvement and extracurricular activities. Most parents in the treatment group believe that the school is a source of support when they encounter problems. This rate is less than half for parents of children in public schools. In addition, all parents in Liceo Jubilar get involved in some way with school activities, whereas only six out of ten parents of public school students report collaborating with school activities.

There are statistically significant differences also in students' involvement in extracurricular activities. Students in the treatment group are more likely to participate in religion workshops, community service activities, tutoring, and job market workshops. Twenty-two percent of treatment students report receiving some kind of tutoring and 41% report participating in job market workshops. The rates are both 4% for control subjects. The average number of extra-curricular activities is 3.9 for treatment students and 1.9 for control subjects.

Table 5. Parental involvement and extracurricular activities

	Treatment	Control	Difference	Std. error	N
	(1)	(2)	(3)	(4)	(5)
Parental involvement					
Parent turns to school in case of problems	0.975	0.478	0.497***	(0.078)	87
Parents collaborate with school activities	1.000	0.587	0.413***	(0.073)	87
Extracurricular activities (weekly basis)					
Sports	0.926	0.804	0.122*	(0.072)	87
Art	0.586	0.435	0.151	(0.107)	87
Religion	0.854	0.109	0.745***	(0.073)	87
Community service	0.415	0.109	0.306***	(0.091)	87
Study group	0.268	0.239	0.029	(0.095)	87
Tutoring	0.219	0.043	0.176**	(0.072)	87
Language	0.171	0.109	0.062	(0.075)	87
Job market training	0.414	0.043	0.371***	(0.084)	87
Number of extra-curricular activities	3.853	1.891	1.962***	(0.289)	87

Notes: * statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%. Regressions are run on the sample of home interview respondents with non-missing items. [1] Treatment subjects are students randomly selected to enter Liceo Jubilar. [2] Control subjects are students that participated in the lottery but were not drafted.

D. Sensitivity and robustness

Results were re-estimated using OLS regressions adjusting for a set of pre-determined covariates (parental education, pre-test results, gender and household asset index). We also run instrumental variables regression using the intention to treat as instrument for the treatment. The different methods produce minor differences in the estimated effects and standard errors, and do not change the conclusions reported above. We also computed, for robustness, Holm-Bonferroni familywise adjusted p-values (Holm 1979), to account for randomness in families of outcomes. Results are quite similar with these adjusted statistics. Authors can make these results available upon request.

E. Cost effectiveness

A cost-effectiveness analysis assesses the incremental opportunity costs associated with the differential impact of an intervention. The annual accounting running costs in Liceo Jubilar were US$ 1,601 per student in 2010. These costs consider expenditures on academic and technical staff, as well as on utilities and other services, but do not take into account in-kind donations (food, books, and other supplies) and volunteer time in the afternoons. When these are assigned an opportunity cost, the school's total running costs are estimated at $ 3,373. Data from the National Administration of Public Schools reveals that in 2008 the average running cost of a public middle school was $ 1,279 per student per year. If we convert this figure to 2010 currency - considering dollar inflation in Uruguay between 2008 and 2010 - the amount is $ 1,470. On the other hand, some students in the control group attend after-school programs offering academic tutoring, sports, and/or a range of workshops (ICT, job training, and crafts). Most of these programs are privately provided but publicly financed by the Uruguayan Institute for Children and Adolescents (INAU). These programs were paid in 2010 a fee of $ 1,300 for each enrolled adolescent. Because only a fraction of the control subjects (15%) attend after-school programs (which implies a cost of $195 = $1,300 × 0.15), the total government expenditure on the average student in the control group is $1,470 + $195 = $1,665. Thus, the incremental running cost of Liceo Jubilar's program per student per year is $3,373 - $1,665 = $1,708. The incremental effect on promotion is obtained from the estimates in Table 3, 2nd row: the intervention improves the likelihood of school progression by 18.7 p.p. Thus, a one-percentage point increase in promotion rates is associated in this population with an incremental expenditure of $91.3 per student per year.

V. Discussion

At one year from treatment initiation, we find a strong impact of Liceo Jubilar on students' academic progression and expectations. Part of this improvement is due to the fact that none of the students in Liceo Jubilar abandoned school before the end of the academic year. In contrast, a fraction of those in the control group that repeated 1st grade had dropped out at an early stage of the year. The transition between elementary and middle school in Uruguay is one of the most critical stages in the education system, with average repetition rates in public schools

of 40%. At a minimum, the personalized and disciplined environment of Liceo Jubilar contributed to deter the most critical cases from leaving school.

Unfortunately, due to imprecise tests and to the small sample size we are unable to say much about academic achievement. There are a couple of reasons to believe that improvements in academic progression were due to increases in learning among students in the evaluated school, rather than to the use of lower thresholds to determine which students would repeat the grade. First, a comparison of students that had to take subject examinations after the summer due to insufficient grades shows that Liceo Jubilar had a smaller proportion having to take 3 or less exams. Students with less than 3 exams are not at risk of repeating the year. While this comparison is not statistically significant, it may be taken as anecdotal evidence that students were improving throughout all the distribution and not only at the margins of repetition. Second, students at Liceo Jubilar were less likely to be absent and more likely to receive tutoring, suggesting a more intense and differentiated exposure to learning.

The large effects observed on students' and parents' academic expectations indicate that Liceo Jubilar promotes a culture of high expectations. Positive expectations about the future have been identified as protective factors for urban children under stress, and have been related to resilience, social adjustment and wellbeing in general (Wyman et al. 1993). Higher expectations may have contributed towards improved academic progression.

Our results also show a striking disparity by treatment status in students' perceptions of safety, discipline, and conflict resolution at school. The large majority of students in the control group believe that conflicts at school cannot be solved without fights, insults, or threats. The pattern is reversed for treatment students. Liceo Jubilar's closeness to students' environments and its internal atmosphere of cohesion appear to operate as protective factors, contributing to keep students at school.

Regarding peer quality, the lower likelihood of having peers with inappropriate age for the grade is a direct consequence of the school's admission criterion of not accepting students that repeated a grade more than once. In addition, baseline comparisons show that the group of students directly selected to enter the school had better results in the pre-test than students subject to randomization (probably

due to spillovers from siblings that had previously attended the school and their parents). One could argue that the school's effects on repetition and expectations are simply due to the positive influence of higher achieving or more motivated peers on their fellow students. On the other hand, the school's selection criterion of accepting only students below the poverty line tends to counterbalance this argument. The average student in public schools has a smaller family, is more likely to live with both biological parents, and shows higher levels of family education and income than students in Liceo Jubilar (as reported in the initial comparison with the Uruguayan household survey). The sign of the peer effect is, thus, ambiguous.

Finally, a study of the organizational structure of Liceo Jubilar and other 39 public and private schools suggests that the leading role of the principal, and the capacity of the management team to involve and motivate teachers, could be behind the identified treatment school effects (Assandri, Podestá, Sarasola, and Troncoso 2010).[11]

Our analysis of school characteristics reveals that Liceo Jubilar shares many of the "No Excuses" features that have been identified as key inputs in the success of privately managed urban schools in the US, namely, a small size, a long day and year, a culture of high expectations, the ability to selectively hire teachers, an environment of strict discipline, and differentiated teaching (Abdulkadiroğlu, Angrist, Dynarski, Kane, and Pathak 2011; Dobbie and Fryer 2011b). We are unable to assess, however, the extent to which frequent testing, a strong student workload, and academic pressure, some of the most cited features of No Excuses models, play an important role in Liceo Jubilar's pedagogic approach. On the one hand, Liceo Jubilar does not seem to employ polarizing tactics used in some No Excuses charters, such as publishing students' performance on the hallway and displaying students below grade level in a red zone (Taylor 2015). These differences in approaches may explain why the "No Excuses" model generates high exit rates of students, whereas the evaluated school has virtually a zero exit

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[11] This may be due to the fact that Liceo Jubilar is small relative to other comparison schools: the cohort in Liceo Jubilar has 70 students compared to 382 in other public schools.

rate. On the other hand, we are aware of the school's effort to employ differential strategies that may improve academic achievement, such as the hiring of experts in psychology and pedagogy, the use of alumni to tutor current students, and investments in teachers' training. Because of the poor discriminating quality of the assessments used in this evaluation, we are unable to infer much about Liceo Jubilar's learning outcomes. We are in the process of evaluating the third year outcomes, where we used improved Math and Spanish test, and expect to be able to say more about academic achievement in such instance.

Despite this drawback, our analysis seems to emphasize the school's orientation towards the adoption of certain values and the provision of a nurturing and safe environment to students. Liceo Jubilar may be more likely than some "No Excuses" models to focus on a range of socio-emotional skills as a primary objective in itself, not placing unique importance on academic achievement. The high rates of oversubscription as well as parents' and students' satisfaction with the school may indicate a value for discipline, nurturing, and safety in addition to academic outcomes. In this sense, the evaluated school could be potentially closer to catholic schools that have been evaluated in the literature, such as Fe y Alegria schools or catholic voucher schools in Chile.

VI. Conclusions

Policymakers in developing countries seem to agree on the urgent need to improve the quality of education, enhance human capital trajectories, and promote equality of opportunities (Adriazola, Macedo, Katzkowiz and Salgado 2005). Decentralization of public schools and private provision of schooling are alternatives being discussed and implemented in many countries.

There is little rigorous evidence in Latin America on the impact of privately managed schools on low-income adolescents. Using a randomized design, we study the impact of a private tuition-free middle school on the academic outcomes of poor students. Our evaluation follows up and compares a cohort of 1st grade middle school students that were randomly assigned to attend this privately managed school or to attend public schools as usual. Our analysis also quantifies the incremental costs associated with the school's improved promotion rates, relative to the control group's alternative.

Based on administrative data and students' and parents' surveys, we explore channels that may explain the treatment effect on educational outcomes. While we cannot disentangle a single mechanism, the school features several characteristics also found in "No Excuses" schools and responsible for large academic gains in other countries: extended instructional time, differentiated teaching, a culture of high expectations, and an involved and motivated staff, probably associated with the school's flexibility to hire and fire teachers, although it does not seem to employ their polarizing tactics. The school also shares features that are present in other successful private initiatives and are likely to be valued by parents as competing outcomes: a safe and disciplined environment, close parental involvement, and extracurricular activities.[12]

The external validity of our conclusions is limited in principle to families similar to those that signed up for a placement in Liceo Jubilar and that satisfy Liceo Jubilar's inclusion criteria. In other words, our conclusions can only be extrapolated to adolescents that do not exceed the grade-appropriate age in more than a year, and that come from poor families with enough motivation to seek for better education alternatives. Despite this selectivity, we believe that the analysis of this experience can provide tools to policy makers and educators that want to pursue the road of higher center autonomy and decentralization. The extension of public funding to privately managed schools or the application of some of these strategies to more autonomous public schools could be alternative promising pathways to improve academic outcomes for poor adolescents in developing countries.

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[12] We cannot attribute the results to the effects of competition because the school was not yet competing for students or public funding in 2010. The continuous need of private funding and new competing private initiatives may increase the pressure for accountability and results in the future.

Appendix

Table A1. Differences in pre-enrollment characteristics by ITT in two subsamples

	Subsample 1: available test results (N=93)				Subsample 2: non-missing values in relevant survey items (N=87)			
	Treatment	Control	Difference	Std. error	Treatment	Control	Difference	Std. error
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	12.285	12.277	0.008	(0.102)	12.305	12.20	0.106	(0.101)
Male	0.429	0.510	-0.081	(0.105)	0.439	0.52	-0.083	(0.108)
Preschool	0.763	0.717	0.046	(0.097)	0.784	0.71	0.073	(0.101)
Public Primary School	0.714	0.720	-0.006	(0.095)	0.732	0.69	0.043	(0.099)
After school program	0.357	0.320	0.037	(0.100)	0.341	0.33	0.008	(0.103)
Good/Excellent student	0.547	0.392	0.155	(0.104)	0.537	0.44	0.102	(0.108)
Avg/Regular student	0.357	0.529	-0.172*	(0.103)	0.366	0.48	-0.112	(0.107)
Bad student	0.095	0.078	0.017	(0.060)	0.098	0.087	0.011	(0.063)
Repeated at least one grade	0.167	0.196	-0.029	(0.081)	0.171	0.152	0.019	(0.080)
Results from pre-test	4.878	4.735	0.143	(0.321)	4.900	4.791	0.109	(0.340)
Less than 4 in pre-test	0.357	0.412	-0.055	(0.102)	0.341	0.391	-0.050	(0.104)
Catholic	0.548	0.449	0.099	(0.106)	0.561	0.523	0.038	(0.109)
Other religions	0.072	0.082	-0.010	(0.056)	0.073	0.091	-0.018	(0.060)
Number of people in household	4.500	4.529	-0.029	(0.326)	4.415	4.283	0.132	(0.334)
Both parents at home	0.547	0.627	-0.080	(0.103)	0.561	0.587	-0.026	(0.107)
Only one parent at home	0.166	0.176	-0.010	(0.079)	0.170	0.217	-0.047	(0.086)
House owners	0.195	0.120	0.075	(0.078)	0.200	0.111	0.089	(0.080)
Parents' Educ: Primary only	0.643	0.540	0.103	(0.103)	0.610	0.511	0.099	(0.108)
Parents' Educ: High school	0.119	0.120	-0.001	(0.069)	0.122	0.156	-0.034	(0.075)
Hhld head works full time	0.810	0.820	-0.010	(0.082)	0.829	0.844	-0.015	(0.081)
Household income	11287	12650	-1363	(1202)	11315	12682	-1368	(1254)
Durable goods index	0.348	0.310	0.038	(0.037)	0.340	0.301	0.039	(0.038)
Cash transfers from Government	0.500	0.480	0.020	(0.106)	0.512	0.511	0.001	(0.109)

Notes: * statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%. [1] Treatment subjects are students randomly selected to enter Liceo Jubilar. [2] Control subjects are students that participated in the lottery but were not drafted.

Table A2. School's running costs per student (2010 US dollars[1])

Academic and technical staff	1,113
School management	298
Academic coordination	280
Teachers	447
Technical staff (social worker, psychologist)	88
Utilities and other services	488
Utilities	355
Other services (janitors, security)	133
Extracurricular activities	973
Coordinator	101
Volunteer staff - imputed value	792
School trips and outings	80
Supplies, materials, and other costs	799
Books, uniforms and other supplies	102
Meals	624
Parents' time	73
Total Running Costs per Student	3,373

Notes: [1] The exchange rate in 2010 was 20 Uruguayan pesos per US dollar.

References

Abdulkadiroğlu, Atila, Joshua D. Angrist, Susan M. Dynarski, Thomas J. Kane, and Pathak A. Parag (2011). Accountability and flexibility in public schools: Evidence from Boston's charters and pilots. *Quarterly Journal of Economics* 126: 699-748.

Adriazola, Francisco, Beatriz Macedo, Raquel Katzkowiz and Carol Salgado (2005). Educación secundaria en la región: ¿Dónde estamos y hacia dónde vamos? UNESCO. Retrieved from http://portal.unesco.org/geography/es/ev.php-URL_ID=9416&URL_DO=DO_TOPIC&URL_SECTION=201.html

Alcázar, Lorena, and Néstor Valdivia, (2005). Escuelas Fe y Alegría en Perú: análisis del modelo de gestión institucional y pedagógica y lecciones para la educación pública. In J. C. Parra Osorio and Q. Wodon, editors, *Escuelas religiosas en América Latina: Estudios de caso sobre Fe y Alegría*. Retrieved from http://www.feyalegria.org/images/acrobat/EstudioDeCasoSobreFyA_WB.pdf

Allcott, Hunt V., and Daniel Ortega, (2009). The performance of decentralized school systems: Evidence from Fe y Alegría in Venezuela. Policy Research Working Paper 4879, World Bank.

Andrabi, Tahir, Jishnu Das, and Asim Ijaz Khwaja (2015). Delivering education: A pragmatic framework for improving education in low-income countries. Policy Research Working Paper 7277, World Bank.

ANEP CES 2012. Data (descriptive statistics) retrieved from http://aplicaciones. ces.edu.uy/Indicadores/servlet/hmoneducns.

Angrist, Joshua D., Eric Bettinger, Erik Bloom, Elizabeth King and Michael Kremer (2002). Vouchers for private schooling in Colombia: Evidence from a randomized natural experiment. *American Economic Review* 92: 1535-1558.

Angrist, Joshua D., Parag A. Pathak and Christopher R. Walters (2013). Explaining charters schools effectiveness. *American Economic Journal: Applied Economics* 5: 1-27.

Angrist, Joshua D., Susan M. Dynarski, Thomas J. Kane, Parag A. Pathak, and Christopher R. Walters (2010). Inputs and impacts in charter schools: KIPP Lynn. *American Economic Review* 100:239-243.

Angrist, Joshua, Eric Bettinger, and Michael Kremer (2006). Long-Term educational consequences of secondary school vouchers: Evidence from administrative records in Colombia. *American Economic Review* 96: 847-862.

Aristimuño, Adriana and Gustavo De Armas, G. (2012). La transformación de la educación media en perspectiva comparada: Tendencias y experiencias innovadoras para el debate en Uruguay. Montevideo, UNICEF.

Asociación Nacional de Educación Pública (2009). Coordinación de acciones y proyectos del área matemática del Consejo de Educación Secundaria (CAPAM-CES) y equipo del programa PISA Uruguay de la División de investigación, evaluación y estadística del Consejo Directivo Central (DIEE CODICEN) 2009. Primer informe. Evaluación en matemática Ciclo Básico 2009. CODICEN, Uruguay.

Asociación Nacional de Educación Pública (2010). Uruguay en PISA 2009. Primeros resultados en Ciencias, Matemática y Lectura del Programa Internacional de Evaluación de Estudiantes. Programa PISA Uruguay - ANEP/CODICEN. DIEE.

Assandri, Verónica, Mora Podestá, Marcos Sarasola, and Patricia Troncoso (2010). La cultura organizacional en centros educativos de Uruguay. Manuscrito. Fundación Horreum, Gobierno Vasco y Universidad Católica Dámaso Antonio Larrañaga, Uruguay.

Barrera-Osorio, Felipe (2007). The impact of private provision of public education: Empirical evidence from Bogota's concession schools. Policy Research Working Paper 4121, World Bank.

Booker, Kevin, Tim Sass, Brian Gill, and Ron Zimmer (2014). Charter high schools' effects on long term attainment and earnings. Research Paper 14-05, Andrew Young School of Policy Studies.

Bruns, Barbara, Deon Filmer, and Harry Anthony Patrinos (2011). Making schools work: New evidence on accountability reforms. Washington, D.C., World Bank.

Di Gropello, Emanuela (2006). Meeting the challenges of secondary education in Latin America and East Asia: Improving efficiency and resource mobilization. International Bank for Reconstruction and Development and World Bank.

Dobbie, Will, and Roland G. Fryer Jr. (2011a). Are high-quality schools enough to increase achievement among the poor? Evidence from the Harlem Children's Zone. *American Economic Journal: Applied Economics* 3: 158-187.

Dobbie, Will, and Roland G. Fryer Jr. (2011b). Getting beneath the veil of effective schools: Evidence from New York City. Working Paper 17632. National Bureau of Economic Research.

Dobbie, Will, and Roland G. Fryer Jr. (2013). The medium-term impacts of high-achieving charter schools on non-test score outcomes. Working Paper 19581. National Bureau of Economic Research.

Epple, Dennis, Richard Romano, and Ron Zimmer (2015). Charter schools: A survey of research on their characteristics and effectiveness. Working Paper 21256. National Bureau of Economic Research.

Fryer, Roland G. (2014). Injecting charter school best practices into traditional public schools: Evidence from field experiments. *Quarterly Journal of Economics* 129: 1355-1407.

Gallego, Francisco (2005). Voucher-school competition, incentives and outcomes: Evidence from Chile. Unpublished manuscript. Massachusetts Institute of Technology.

Graduate XXI (2013). High school graduation rates in Latin America. Inter-American Development Bank. Retrieved from http://www.graduatexxi.org/en/que-es-la-desercion-escolar/.

Holm, Sture (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics* 6: 65-70.

Hoxby, Caroline M. and Jonah E. Rockoff (2005). The impact of charter schools on student achievement. Unpublished manuscript. Harvard Institute of Economic Research.

Hoxby, Caroline M., Sonali Murarka, and Jenny Kang (2009). How New York city's charter schools affect achievement. Cambridge, MA, New York City Charter Schools Evaluation Project.

INE (Instituto Nacional de Estadisticas). Uruguayan Household Survey 2009. Microdata. http://www.ine.gub.uy/microdatos/microdatosnew2008.asp#ech

Kim, Jooseop, Harold Alderman, and Peter F. Orazem (1999). Can private school subsidies increase schooling for the poor? The Quetta Urban Fellowship Program. Policy Research Working Paper 11. World Bank.

Muralidharan, Karthik, and Venkatesh Sundararaman (2013). The Aggregate Effect of School Choice: Evidence from a two-stage experiment in India. Working Paper 19441. National Bureau of Economic Research.

Osorio, Juan Carlos Parra, and Quentin T. Wodon (2010). Performance of Fé y Alegría High school students in Colombia: Is it a matter of Fe (Faith) or Alegria (Joy)? Policy Research Working Paper 5413. World Bank.

Taylor, Kate (2015). At Success Academy charter schools, high scores and polarizing tactics. *New York Times*, April 6th 2015.

Toma, Eugenia, and Ron Zimmer (2012). Two decades of charter schools: Expectations, reality, and the future. *Economics of Education Review* 31: 209-212.

Wong, Mitchell D., Karen M. Coller, Rebecca N. Dudovitz, David P. Kennedy, Richard Buddin, Martin F. Shapiro, Sheryl H. Kataoka, Arleen F. Brown, Chi-Hong Tseng, Peter Bergman, and Paul J. Chung (2014). Successful schools and risky behaviors among low-income adolescents. *Pediatrics* 134: e389-e396.

Wyman, Peter A., Emory L. Cowen, William C. Work, and Judy H. Kerley (1993). The role of children future expectations in self-esteem functioning and adjustment to life stress: A prospective study of urban at risk children". *Development and Psychopathology* 5: 645-61.