Breaking the Barriers to Higher Education: The Long-Term Benefits of a Boarding School for Disadvantaged Students.*

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Abstract

France ranks among the OECD countries with the lowest levels of intergenerational social mobility. To address this issue, the "Boarding School of Excellence" initiative aims to provide adolescents from low socio-economic backgrounds with a supportive boarding school environment and improved learning conditions. This paper presents the long-run results of a randomized controlled trial measuring the effects of one such boarding school. We show that it divides by two the proportion of high-school dropouts, and increases by 60% the proportion of higher-education graduates. These large effects, obtained on adolescents, are comparable to those of celebrated preschool interventions. Effects are even higher among students who do not only speak French at home, referred to as minorities. The boarding school has large short-run effects on minorities' cognitive and socio-emotional scores. A decomposition shows that both effects predict minorities' large long-term effects.

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1 Introduction

Of the 11 countries where intergenerational income mobility has been reliably measured using fiscal income data, France is the country where mobility is the second lowest, almost on par with the United States. Intergenerational income mobility is much lower in France and the US than in Scandinavian countries, Switzerland, Australia, Canada, or Spain (Kenedi & Sirugue 2023).

Inequalities in access to higher education (HE) may play a large role in France's low mobility. While 35% of youth whose parents belong to the lowest income decile enroll in HE, 90% do so when their parents are in the top decile. This level of inequality is comparable to that in the US (Bonneau & Grobon 2024), despite the fact that enrolling in a university is nearly free in France. Inequalities in the probability to graduate conditional on enrolling may also play a role in France's low mobility. Only 46.9% of students that entered a three-years undergraduate university degree ("Licence") in 2018 graduate in three or four years (Klipfel 2023). Among students from high socio-economic status (SES) families, this rate is equal to 55.3%, against 38.4% among students from low SES families. Again, similar issues exist in the US, where the graduation rate in six years from four-year colleges is equal to 63.4%, while the graduation rate in three years from two-years colleges is equal to 30.3% (Hussar et al. 2020).[1]

A related social issue in France, as in many countries, is migrants' integration. In the fall of 2005, important riots took place in the suburbs of Paris and other large French cities, where youth unemployment is high and economic opportunities are low. As many rioters had an immigrant background, with family origins in the Maghreb and Sub-Saharan Africa (Mucchielli & Le Goaziou 2013), those events were perceived by the French political class as a failure of the French integration model. As a response, President Nicolas Sarkozy launched the "Espoir Banlieues" (Hope for the Suburbs) plan. With numerous references to immigration and diversity, Sarkozy's announcement speech is a call to end discrimination against "deserving" youth with an immigrant background, and improve their opportunities: "To youngsters from immigrant backgrounds that study hard at school and want to pursue their studies, I want to say that our country shall not respond anymore to their courage with the cowardice of discrimination." One of the announcements made was the creation of "Internats d'excellence" (Boarding Schools of Excellence, henceforth BSE). These middle and high schools cannot explicitly target students based on their ethnicity or their country of origin, as such targeting would be illegal in France. Instead, eligibility is based on school districts: eligible students have to be schooled in "quartiers de la politique de la ville", a designated list of deprived urban areas that de facto have a higher-than-average proportion of students with an immigrant background. The cost per student in the BSE we study in this paper is twice as large as in a regular public school (Behaghel et al.

[1] US graduation rates by SES are not available, but the low graduation rates of Blacks at four-year colleges (44.3%) and at two-year colleges (23.0%) goes in the same direction as the SES gradient in France.

2017). Such an intensive and targeted educational intervention is, to our knowledge, unique in France, a country famously attached to egalitarian and universalist values, where any kind of affirmative action is controversial.

The Sourdun boarding school, located in the greater Paris area, is the first BSE to have opened. It was oversubscribed, with applications coming from low-SES students, at the median of the French distribution of scores, but around 40% of a standard deviation (σ) above their classmates. In 2008 and 2009, admitted students were randomly selected, and in Behaghel et al. (2017) we estimated the effects of Sourdun, one and two years after the admission lottery. After one year, Sourdun has no effect on students' scores, and a negative effect on their well-being: while Sourdun dramatically increases the quantity and the quality of schooling inputs (boarders benefit from smaller classes, report much lower levels of classroom disruption, and praise the engagement of their teachers), students also have to cope with the separation from their friends and family, and adapt to a new environment where they face strict disciplinary rules and more demanding teachers. After two years, however, the negative effect on well-being is gone, and we estimate a positive effect on students' maths test scores, of 0.2σ per year spent in the school. This effect, while sizeable, remains modest in view of the program's cost.

In this paper, we rely on administrative data to follow our treatment and control groups throughout their secondary and higher education. First, we follow students into secondary education, up to the national end-of-high-school "Baccalaureat" exam, hereafter referred to as the Bac, that grants access to HE. Then, we follow students into HE. We observe the tracks they apply to and enroll in, and whether they graduate. Thus, we can measure the effect of Sourdun on students' highest completed degree. We also explore effects' heterogeneity along a dimension, students' immigrant background, that we had not considered in our original Behaghel et al. (2017) paper, but that is important given the implicit targeting of the intervention.

We start by estimating the first-stage effect of receiving an offer to join Sourdun. We find that treatment group students spend 2.1 more years there than control group ones. Thus, the intention to treat (ITT) effects we estimate reflect the impact of spending on average two years in the boarding school. The counterfactual situation is mostly attending a standard public school, although a small share of control group students attended a private school.

Then, we estimate Sourdun's ITT effect on students' highest completed degree. Receiving a Sourdun offer divides by two the proportion of high school (HS) dropouts (-14.2 percentage point), and it increases by 60% the proportion of students graduating from HE (+15.9 percentage points). The majority of the HE graduation effect comes from degrees in the STEMEL fields (Science, Technology, Engineering, Mathematics, Economics, and Law), that have large labor-market returns. At the middle of the distribution of highest degrees, Sourdun does not change the proportion of Bac graduates, though the Bac exam has three variants, and Sourdun slightly decreases the proportion of vocational or technical Bac graduates, and slightly increases

the proportion of general (i.e. more academically oriented) Bac graduates. Unfortunately, linking educational and labor market data is not possible yet in France. Still, to assess the potential labor-market effects of the intervention, and to summarize Sourdun's effects into an easily interpretable number, we compute average monthly earnings by highest degree in the French labor force survey, and estimate Sourdun's ITT effect on students' imputed earnings based on their degree. We find an effect of 153 euros per month, an 11% increase relative to the control group.

To benchmark the effects of Sourdun, we conduct two literature searches, to identify pre-, primary-, or secondary-school interventions in high-income countries, that were randomized or quasi-randomized, and for which effects on HS completion, HE enrolment, or HE graduation are available. First, we use the survey of Fryer Jr (2017), and identify eight interventions meeting our criteria. Second, we review the 169 articles citing on Google Scholar Curto & Fryer (2014), a seminal paper in the boarding school literature, and identify two more interventions. Our final sample includes 11 interventions: the Perry and Abecedarian pre-schools, the Moving To Opportunity intervention, Boston's no excuses charter schools, the Harlem Promise Academy charter school, Chicago's Noble Street Charter School, an elite boarding school in North-Carolina, a Conditional Cash Transfer program in NYC, a program giving private-schools vouchers in Washington DC, Early College HSs where students can earn college credits, and Sourdun. Eight studies report effects on HS graduation, eight report effects on HE enrolment, but only four report effects on HE graduation. Sourdun is the intervention with the second largest effect on HS completion, the largest effect on HE enrollment, and the only intervention with Abecedarian that demonstrates an effect on HE graduation: its absolute effect is comparable to that of Abecedarian, although its relative effect is smaller. While we do not claim that our searches are exhaustive, Sourdun is a rare example of a non-early-childhood intervention with a demonstrated effect on HE graduation, an important determinant of socio-economic success.

Then, we attempt to investigate if Sourdun's effects differ for students with and without an immigrant background, as the former group is, implicitly at least, the policy's primary target. Since we do not have direct information on immigration history, we instead consider students living in a family where another language than French is spoken at home, referred to as "minority students", who make up 55% of our study population, versus 20% only in the general population.[2] For both minority and majority students, Sourdun reduces by 23 percentage points the proportion of students that either dropout from HS, or graduate from a vocational or technical HS only. Among majority students, this mirrors an 11 percentage points increase in the proportion of students whose highest degree is the general Bac, and a 12 percentage points increase in the proportion of HE graduates. Among minority students, the proportion of general-Bac graduates increases by 5 percentage points only, while the proportion of HE graduates increases by 18

[2]In a general population survey where immigration history and language spoken at home are available, having a least one non-French or non-French-born parent is very strongly correlated to our minority/majority proxy.

percentage points. Within HE degrees, Sourdun has a large positive effect on the proportion of minority students that graduate from elite "Grandes Ecoles" the main route to socio-economic success in France: this proportion increases from 0% in the control group to 7.7%, a larger proportion of "Grandes Ecoles" graduates than in the general population (3.6% in the French labor force survey). For majority students, the effect on the proportion of "Grande Ecole" graduates is negative and insignificant. Overall, we marginally reject the null that Sourdun's effects on students' highest degree are the same for minority and majority students, and the effect on imputed earnings is twice as large for minorities, though the difference is not significant.

We shed some light on why students benefit so much from Sourdun. Sourdun is a multi-faceted intervention: on top of the boarding component of the intervention, boarders study with more academically-oriented peers, in smaller classes, with more motivated and demanding teachers, and face less classroom disruption. Our research design does not allow us to separately estimate the effect of each of those components, though in view of Sourdun's remarkably large effects, it may be that each input matters for the intervention's success. We also shed some light as to why minorities seem to benefit more from those inputs. In our control group and in a general population survey, we find that holding test scores constant, minority families have more ambition for their children than majorities. Accordingly, their children have better outcomes all the way up to HE *enrollment*. But then, minority students experience a very large dropout rate, even larger than that of majority students. Accordingly, minority students end up being not more likely to graduate from HE. Instead, in the treatment group of our experiment, minorities obtain better outcomes than majorities all the way till HE graduation. Thus, Sourdun seems to lift some barriers that would otherwise prevent them from fulfilling their greater ambition. We show that the boarding school already had significantly larger effects on minorities two years after the lottery, both on their cognitive and socio-emotional scores. In a simple decomposition, both effects contribute, roughly equally, to predicting minorities' large long-run effect.

Contributions to the literature, and paper outline

This paper contributes to an emerging literature on the effects of boarding schools, recently summarized by Zhong et al. (2024). Their meta-analysis includes 49 studies. The majority consider Chinese schools, though boarding-school effects have also been studied in Australia (Martin et al. 2014), the US (Curto & Fryer 2014, Shi 2020), France (Behaghel et al. 2017), or the UK (Foliano et al. 2019). Across the 49 studies, Zhong et al. (2024) find positive effects on students' cognitive development, but negative effects on their self-esteem and well-being, in line with the results in Behaghel et al. (2017). The only other study that looks at boarding school effects on HE outcomes is Shi (2020), who considers an elite boarding school in North Carolina. While she finds positive effects on HE enrolment and college selectivity, she does not find effects

on HE graduation. The school she studies is an elite school. It serves gifted students, scoring 1.8 and 1.4σ above the average in maths and reading, without prioritizing low-SES students. By contrast, Sourdun serves disadvantaged students with ability levels close to the average. Thus, our paper is the first to assess if boarding schools can reduce the SES gradient in enrollment in, and graduation from, HE.

More generally, this paper contributes to the literature on interventions aiming to reduce educational inequalities. As mentioned above, Sourdun seems to be a unique case-study of a non-early-childhood intervention with large effects on HE graduation. Our analysis also highlights HE dropout as an important juncture in students' trajectories. In our literature searches, we found more studies looking at HE enrollment than at HE graduation. This is despite the fact that HE dropout rates are high in countries like France or the US, that HE dropout disproportionately affect low SES and minority students, and that it can reduce or annihilate interventions' positive effects (Davis & Heller 2019, Shi 2020).

Finally, this paper contributes to the literature on the effects of educational interventions among minority students. In the US, Card & Giuliano (2016) find that "high-achiever classrooms" have large positive effects on the test scores of Black and Hispanic students, but no effects on White students. They hypothesize that in a high-achiever class, minority students are less exposed to obstacles they face in regular classrooms, such as low teacher expectations and negative peer pressure. Similar mechanisms may be at play in our study. In our control group, a social self-esteem score measuring students' perception of their popularity is 0.63σ lower among minority than among majority students. Thus, the students in our study, whose grades are above their classes' average in their sending schools, are more at odds with their peers in the minority than in the majority group. Sourdun completely changes that: while it has a negative and insignificant effect on the self-esteem of majority students, it increases that of minority students by 0.62σ. Consistent with Sourdun's unremarkable short-run test-score effects, our simple decomposition suggests that such non-cognitive effects explain a part of Sourdun's remarkable long-run effects on minority students. This hypothesis is also consistent with the results of Jackson et al. (2024), who find that in the US, schools' *overall* value added, both on students' cognitive and socio-emotional scores, has a larger effect on the long-run outcomes of disadvantaged students than schools' value added on cognitive scores only. Another related paper is Carlana et al. (2022). They show that in Italy, conditional on ability, non-Italian children enroll more into vocational high schools than natives, and a tutoring and career counseling intervention closes that gap among high-ability boys. We instead find that in France, conditional on ability minority children have more ambition and better outcomes than majorities, all the way up to HE enrolment. This may be due to the fact that many students we label as minorities are probably French, and their families may have emigrated earlier than those in Carlana et al. (2022).

The paper is organized as follows. Section 2 presents the research design, the study population,

the institutional context, the data, and the treatment. Section 3 presents Sourdun's effects on students' secondary and tertiary education. Section 4 investigates heterogeneous effects between minority and majority students. Section 5 concludes.

2 Research design, study population, institutional context, data, and first stage

2.1 Research design

A waiting list randomization. We study Sourdun's first two cohorts, admitted in September 2009 and September 2010. In 2009, seats were offered to students in 8th to 10th grades. In 2010, seats were offered to students in 6th to 11th grades. The boarding school had set a predetermined intake of students at the grade and gender levels, to ensure that male- and female-only dormitories of given sizes could be formed. In 14 grade $\times$ gender stratum in which the number of applicants exceeded the number of seats, we randomly assigned a waiting list number to applicants. Seats were offered following this order. 395 applications were entered in our lotteries. 261 received an offer: they make up our treatment group. 134 did not receive an offer: they make up our control group.

Estimation method. We estimate intention-to-treat (ITT) effects of receiving an offer to join Sourdun on students' outcomes. To do so, we estimate OLS regressions of our outcomes on a lottery-offer indicator, and the same statistical controls as in Behaghel et al. (2017), with weights that follow De Chaisemartin & Behaghel (2020) to account for the fact that waitlist randomizations lead to an over-representation of compliers among units that receive an offer. Standard errors are clustered at the student level, to account for the fact that our analysis is at the application level, and three students participated both in the 2009 and in the 2010 lottery. In Behaghel et al. (2017), we verified that our lotteries created treatment and control groups balanced on a number of baseline characteristics, including academic ability and socio-economic background (see Table 1 therein).

2.2 The population of applicants to the boarding school

Selection into the study population. As explained in Behaghel et al. (2017), our study population arose as follows. Sourdun was intended to students from "quartiers politiques de la ville" schools in the Creteil school district, which contains many of Paris' poorest suburbs. In the fall of each year, the Ministry of Education (MoE) wrote to the principals of those schools, asking them to identify motivated students who lacked home environments conducive to studying, and

to encourage these students to apply. Students interested in joining the school then had to fill out an application form, write a letter of application, and provide a letter from a parent. Finally, a selection committee discarded 37% of applications which were deemed ineligible. Our study population are applicants deemed eligible by the committee.

Description of the study population. In Table 2 of Behaghel et al. (2017), we described the study population. It comprises 57 percent of girls. When they apply, students are on average 14 years, and they are around the upper third decile of their class's grade distribution in French and mathematics. Slightly more than half of them have taken the end-of-middle-school national exam before applying. Those students scored 13.5 percent of a standard deviation higher than the French average in French and mathematics, and 42.5 percent of a standard deviation higher than their classmates. Applicants also come from low socio-economic-status families. For instance, the share of eligible applicants who are recipients of the means-tested grant for middle- and high-school students is almost twice as large as in the French population. Finally, 55 percent of them live in a family where French is not the only language spoken at home, a good proxy for having an immigrant background as we show in Section 4.1.

2.3 Institutional context and outcomes' definitions.

A brief overview of France's secondary- and higher-education systems. In France, education is compulsory between the ages of 6 and 16. After five years of primary school, students enroll in a four-year middle school. Tracking mostly starts in high school. There, students can either follow a "general", a "technological", or a "professional" track. The general track is purely academic, the professional track is purely vocational, and the technological track is a combination of both. High school lasts three years, at the end of which students take the Baccalauréat exam, hereafter referred to as the Bac.[3] Depending on their track, students either take the general Bac, the technological Bac, or the professional Bac. Having the Bac is a condition to enroll in higher education (HE). First-year HE programs include university programs, which are mostly non-selective, and selective programs. The latter fall into three main categories: two or three years technical and vocational HE programs; Grandes Ecoles which admit students directly after HS; "classes préparatoires aux Grandes Ecoles" (CPGE), which prepare students to the entrance examinations of French elite graduate schools, namely Grandes Ecoles admitting students after CPGE.[4] University graduates in STEM fields, economics and law (STEMEL) tend to have wages and unemployment rates close to those of Grande Ecole graduates. On the other hand, university graduates in other fields have significantly worse labor market outcomes. In universities, students

[3] A two-years vocational track is also available, that does not lead to the Bac; students following that track cannot enter higher education.

[4] This latter category is labelled *Selective Grande Ecole* in the tables.

can first obtain a three-years degree called a Licence. After a Licence, students can enroll in a two-years Master program, thus totalling five years of HE. In universities, the dropout rate is very high: only 46.9% of students that entered a Licence in 2018 graduate in three or four years (Klipfel 2023). Grandes Ecoles also grant Licence and Master degrees, and have low dropout rates. Technical and vocational HE programs lead to two-years long ("Brevet de Technicien Supérieur" or "Diplôme Universitaire de Technologie") degrees, and also have relatively low drop out rates.

Definition of students' highest degree completed. We first partition the population into HS dropouts, namely students who leave HS without the Bac, HS graduates who obtain the Bac but do not graduate from HE, and HE graduates. Within HS graduates, we further distinguish between students who obtain a technical or vocational Bac and those who obtain a general Bac. And within HE graduates, we further distinguish between students who obtain a technical or vocational HE degree, those that graduate from a university in a STEMEL field, those who graduate from a university in another field, those who graduate from an elite Grande Ecole admitting students after a CPGE, those who graduate from a Grande Ecole admitting students after HS, and those who obtain another HE degree.

2.4 Data

Baseline data. We use students' Sourdun application file, and administrative data from their sending school, to describe their socio-economic background, and to construct statistical controls we use in our regressions. The list of controls we use is the same as in Behaghel et al. (2017), namely: students' grades in French, math, and school behavior, as per the transcripts they provided in their application; an indicator for students enrolled in a Greek or Latin optional class at baseline; the level of financial aid students' family receive under the means-tested grant for middle and high school students; an indicator for whether French is the only language spoken at home (our minority indicator); an indicator for students whose parents are unemployed, blue collar workers, or clerks; indicators for boys, the second application cohort, and the school grade when applying. Our main results are robust to dropping these controls.

Standardized tests and surveys conducted one and two years after the lottery. In the years when our lotteries took place, French students did not take standardized tests every year. Consequently, one and two years after the lottery we collected our own data to measure students' academic ability and non-cognitive outcomes. This involved collaborating with 169 different schools. Each year, we gave students two standardized tests, each lasting one hour and 30 minutes. The first test included a one-hour French test and a 30-minute socio-emotional questionnaire. The second test included a one-hour mathematics test and another 30-minute

socio-emotional questionnaire. One and two years after the lottery, we also surveyed students' parents, to get further information on students' socio-economic background, and to measure a number of relevant outcomes, such as parents' academic ambition for their children.

Following students throughout their secondary education. We merge the baseline data and the data we collected one and two years after the lottery with the FAERE-SYSCA datasets of the MoE, which cover the universe of students enrolled in public or subsidized-private middle and high schools.[5] The FAERE-SYSCA data provide information on the students' school, grade level, and program of matriculation. To perform the merge, we use students' "Identifiant National Eleve", a unique student identifier present in both data sets. Doing so, we locate all students of the first Sourdun application cohort in the 2008 FAERE-SYSCA dataset, and all students of the second application cohort in the 2009 FAERE-SYSCA dataset, the respective years when each cohort applied. We then track students in subsequent waves of the FAERE-SYSCA dataset, all the way until 2018, 2 years after the youngest students in our population have reached the age to complete their secondary education. We similarly merge our data with the 2008 to 2018 OCEAN-BAC datasets, which contain, for all Bac candidates, the type of Bac they took and their results.

Following students throughout their higher education. Students' enrollment in and graduation from HE is measured using the 2008 to 2018 FAERE-SYSCA datasets, as well as the 2008 to 2020 SISE datasets of the Ministry of Higher Education. The FAERE-SYSCA datasets cover enrollment in a program located in an HS (CPGE and technical/vocational HE programs). The SISE datasets cover enrollment in a university or in a Grande Ecole, and graduation from technical/vocational HE programs, universities, and Grande Ecoles. The combined FAERE-SYSCA and SISE datasets cover 90 percent of students enrolled in HE in France, with the exceptions of students enrolled in paramedical HE programs, such as nursing schools (5% of students enrolled in HE each year), and students enrolled in private HE programs not accredited by the Government (MENESR 2017). 2020, the last year when we measure students' HE graduation, is 4 years after the youngest students in our study population can obtain the Bac without repeating a grade. The HE graduation of some of those students may still be censored at this stage. For instance, if they repeat a high-school grade, enrol in a Licence degree in a university but also repeat one grade there, they will end up with their first HE degree in 2021. Therefore, as a robustness check, we re-estimate our effects excluding the two youngest cohorts in our study population. In this subsample, which accounts for 88% of our study population, students are observed up to 6 years after they can obtain the Bac, so censoring of the HE graduation outcome should be minimal. To sum up, our data allows us to measure comprehensively and without

[5] In 2017, 0.5% of middle- and high-school students in France where enrolled in a non-subsidized private middle or high school (MENESR 2017).

much censoring the educational outcomes of our study population, unless they leave France, enroll in an HE institution not accredited by the Government, or enrol in a para-medical track.

2.5 First-stage

First-stage effect of a Sourdun offer on the number of years spent there. In order to interpret the effects of a Sourdun offer, the first line of Table 1 shows the first-stage effect of receiving an offer on the number of years spent in Sourdun. On average, students who did not receive an offer spent 0.4 years in the boarding school. This is due to the fact that when two siblings participated in the lottery, if one received an offer the other was automatically admitted. Furthermore, some students that did not receive an offer in the 2009 or 2010 lottery reapplied in the following years and gained admission then. On average, the students who received an offer spent around 2.1 more years in Sourdun than control group students. Given the entry grade a student applied for, we can compute the maximum number of years he or she could have spent in the boarding school if joining the school the year after the lottery, and completing secondary education there without repeating a grade. The second line of Table 1 shows that on average, this maximum number of years in Sourdun is around 3.9. Thus, our effective first-stage is slightly larger than a half of the largest theoretical first stage we could have observed. Figure 1 below shows an histogram of the percent of school years completed in Sourdun, from the year after the lottery to the end of high school, for students receiving an offer. The distribution is bimodal, with 20.7% of students that do not complete a full school year in Sourdun, and 42.5% of "fully treated" students that enroll in the school the year after the lottery and complete their secondary education there. Finally, the last line of Table 1 shows that while 12.4% of control group students ever enroll in Sourdun, a Sourdun offer increases this proportion by 75.6 percentage points.[6] Thus, to convert the ITT estimates we present below into LATE estimates, one can either divide them by 2.084, to get an estimate of Sourdun's LATE per year spent in the school, or by 0.756, to get an estimate of the LATE of having ever been enrolled in the school.

Contrasting treatment- and control-group students' educational experience two years after the lottery. In what follows, we summarize the main take-aways from Section II of Behaghel et al. (2017), where we compared students' experience in the treatment and control groups, two years after the lottery. The teacher-to-student ratio is 36 percent higher in Sourdun, and classes are 22 percent smaller. Boarding school teachers are better educated and less experienced than teachers of control students. They are also more engaged: a standardized score of teachers' engagement, built from students' answers to questions like "Do your teachers care about students' academic progress?", is 1.39 standard deviation (σ) higher among boarders,

[6] A student can be enrolled at some point without completing a full school year in Sourdun.

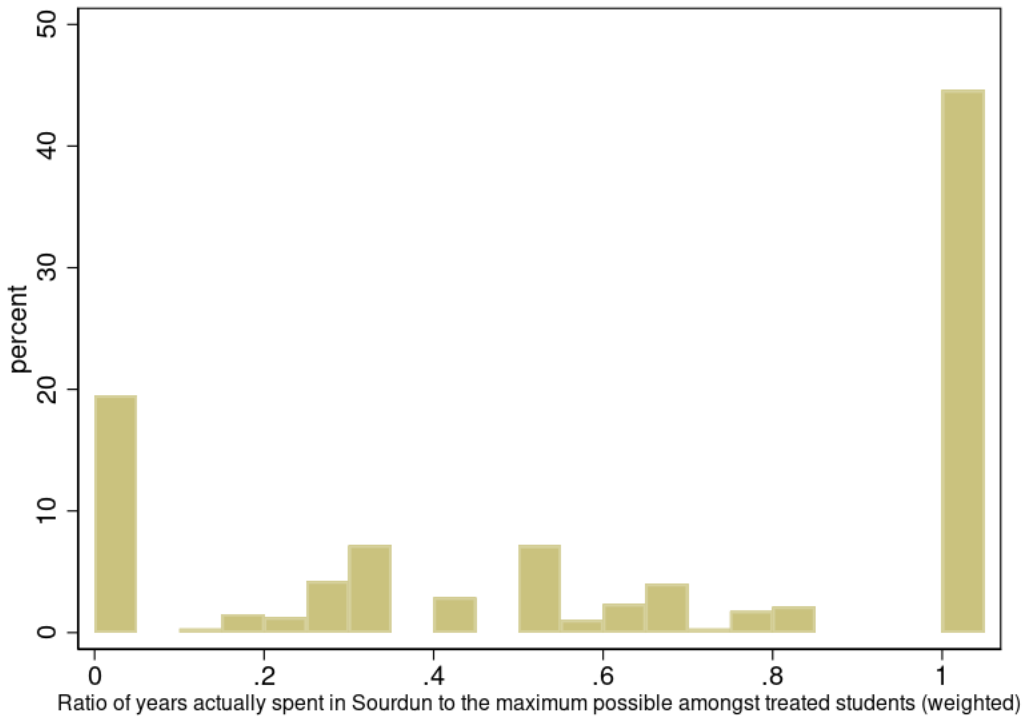


Figure 1

Table 1: First-stage effect of a Sourdun offer on the number of years spent there

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
Nb of years in Sourdun	0.402	2.084	0.168	395
Max. possible nb of years in Sourdun	3.914	-0.064	0.124	395
Ever enrolled in Sourdun	0.124	0.756	0.047	395

Notes: The table reports results from OLS regressions of several dependent variables on a lottery-offer indicator, and the statistical controls listed in Section 2.4, with weights that follow De Chaisemartin & Behaghel (2020) to account for the waitlist randomization process. Column (1) reports the mean outcome in the control group, while Column (2) reports the coefficient on the indicator. Standard errors in Column (3) are clustered at the student level. Students' number of years spent in Sourdun are computed using administrative data.

and a similarly-constructed standardized score of teachers-students relationships is 1.02σ higher. Boarders also benefit from better studying conditions: a standardized score of classroom disruption is 0.73σ lower in Sourdun. At the same time, boarders face strict disciplinary rules and high academic demands. They have to take a two-hour test each week, and grading in Sourdun is much harsher than in a regular school: students experience a substantial decrease in their marks upon joining the school. Students do not have more class hours in Sourdun than in a regular school, but at the end of their school day they have to spend one hour and a half in a study room to do their homework. In control schools, spending some time after the school day in a study room is only a non-mandatory option available to students. This translates into an increase in weekly homework time of around 25%. Access to TV is strictly regulated in Sourdun. Consequently, treated students report watching TV only 25 minutes per day, against 1 hour and 36 minutes for control students. Students in Sourdun also have to wear formal school uniforms, a very unusual practice in French schools. The cost per student in Sourdun is about twice as large as in control schools (21,600 vs. 10,700 euros per year), a difference mostly due to the boarding component of the program.

Contrasting treatment- and control-group students' educational experience at the end of their secondary education. Beyond the first two years after the lottery took place, we no longer have survey data to characterize students' experiences, and have to rely on administrative data. We can still compare the HS of treated and control students in Terminale, the last year of secondary education. Table 2 below shows that treatment group students are 41.1 percentage points (pp) more likely to be enrolled in Sourdun in Terminale, 23.2 pp less likely to be enrolled in another public school, 7.5 pp less likely to be enrolled in a private HS, and 10.4 pp less likely to never be observed in Terminale. Thus, receiving an offer majoritarily induces students to substitute Sourdun to another public school, but it also induces some substitution with private schools,[7] and a reduction in dropout.

3 Effects of Sourdun on students' education

Table 3 below shows the estimated ITT effects of receiving an offer to join Sourdun on students' educational outcomes. Table 12 in the Appendix shows that results are robust to dropping statistical controls from the regression.[8]

[7] Public and private HS in France do not have markedly different value-added (Cour des comptes 2023).

[8] Appendix Table 13 also shows that results are robust to clustering standard errors at the lottery level, as considered in De Chaisemartin & Behaghel (2020).

Table 2: Effect of a Sourdun offer on institution attended during last year of high school

	Control Mean (1)	T-C (2)	s.e. (3)	N (4)
In Sourdun	0.060	0.411	0.043	395
In another public HS	0.611	-0.232	0.064	395
In a private HS	0.097	-0.075	0.036	395
Never in last year of HS	0.233	-0.104	0.048	395

Notes: The table reports results from OLS regressions of several dependent variables on a lottery-offer indicator, and the statistical controls listed in Section 2.4, with weights that follow De Chaisemartin & Behaghel (2020) to account for the waitlist randomization process. Column (1) reports the mean outcome in the control group, while Column (2) reports the coefficient on the indicator. Standard errors in Column (3) are clustered at the student level. Students' institution in their last year of high school is determined using administrative data.

A Sourdun offer divides by two the proportion of HS dropouts. The first line in the table shows that 27.0% of control group students are HS dropouts. This proportion is higher than in the general population: among French students born in 1996, a cohort close to the midpoint of birth cohorts in our study population (1994 to 1999), the proportion of HS dropouts is equal to 22.4% (Barhoumi & Caille 2020). This is despite the fact that the average academic ability of our study population is slightly higher than the median of the general population, probably reflecting the socio-economic gradient in educational outcomes conditional on ability. Receiving a Sourdun offer significantly reduces the HS dropout rate by 14.2 pp, thus dividing it by more than two, and bringing it to a level almost twice lower than in the general population.

A Sourdun offer increases by 60% the proportion of HE graduates. 73.0% of control group students are HS graduates, and 57.1% ever enroll in HE, thus implying an HE enrolment rate among HS graduates of 78.2%, very close to the 75% enrolment rate in the population of French students (MENESR 2017). Consistent with France's high HE dropout rate, only 45.3% of control group students ever enroll in the 2nd year of an HE program, and 26.3% ever enroll in the 3rd year. Eventually, 26.7% of control group students graduate from HE,[9] while 46.3% remain HS graduates. The HE graduation rate conditional on enrolling is equal to 46.8%, which is almost identical to the percentage of students that obtain a Licence three or four years after

[9] A few HE degrees in France take two years to complete.

enrolling in a French university (Klipfel 2023). Receiving a Sourdun offer substantially and significantly increases the proportion of students that ever enroll in HE (+19.7 pp) and that graduate from HE (+15.9 pp). The bulk of that increase comes from a 12.4 pp increase in the proportion of students graduating from a non-selective university in a STEMEL field. A Sourdun offer also doubles the proportion of students graduating from a selective Grande Ecole, though that effect is insignificant. Effects on other HE degrees are smaller and insignificant. In the treatment group, the HE graduation rate conditional on enrolling is equal to 55.5%, which is almost identical to the percentage of high-SES students that obtain a Licence three or four years after enrolling (Klipfel 2023). Finally, receiving a Sourdun offer does not strongly affect the proportion of students graduating from HS (-1.7 pp, insignificant). This hides a negative but marginally significant effect on the proportion of students whose highest degree is a technical or vocational Bac (-7.9 pp), and a positive but insignificant effect on the proportion of students whose highest degree is a general Bac (+6.2 pp).

A Sourdun offer increases imputed earnings by 10.6%. Unfortunately, linking educational and labor market data is not possible yet in France. Still, to assess the potential labor-market effects of the intervention, we conduct the following exercise. Using the French labor force surveys from years 2013 to 2019, we compute average monthly earnings of individuals aged 30 to 35, by highest degree completed. Then we construct, for each student in our population, an outcome equal to the average wage attached to their highest degree. Finally, we estimate the effect of a Sourdun offer on that outcome. This effect may be interpreted as an effect on imputed earnings based on highest degree completed. We find a sizable imputed earnings increase of 152.78 euros per month, a 10.6% increase relative to the control-group mean. As the intervention increases students' average years of schooling by 1.03, its effect on imputed earnings translates into a 10.3% return per year of schooling, relatively high in the range of returns to education summarized by Card (1999). Of course, the actual earnings effect of the intervention may differ from our imputation. First, the general-population differences between the earnings of individuals with different degrees may not be causal. Second, even if those differences are causal, degrees' returns may differ in our population and in the general population. Third, Sourdun also affects students' socio-emotional outcomes (Behaghel et al. 2017), which could have an effect on their labor-market outcomes. Despite those limitations, this prediction exercise is useful to summarize the effects in Table 3 into a single, easily interpretable index.

Censoring. Remember that 2020, the last year when we measure students' HE graduation, is 4 years after the youngest students in our study population can obtain the Bac without repeating a grade. The HE graduation of some of those students may still be censored at this stage. Therefore, Table 19 in the Appendix shows the effects we obtain when we exclude the two youngest cohorts in our study population. In this subsample, which accounts for 88% of

our study population, students are observed up to 6 years after they can obtain the Bac, so censoring of the HE graduation outcome should be minimal. The control-group HE graduation rates are extremely similar in this subsample and in the full sample. And Sourdun's effect on HE graduation is even larger in this subsample. Overall, we find little evidence of censoring.

Sourdun's effects are unusually large when compared to that of other educational interventions. To compare Sourdun's effects to that of other interventions, we started from the survey of 196 randomized field experiments in developed countries in Fryer Jr (2017). We looked at all interventions appearing in the same sentence as the word "completion" or "graduation" in that paper, and thus identified eight pre-, primary-, or secondary-school interventions for which effects on HS completion, HE enrolment, or HE graduation are available. To identify more interventions, we also reviewed the 169 articles, which as per a Google scholar search conducted on 8/30/2024, cite Curto & Fryer (2014), a seminal paper in the boarding school literature. This search yielded two more interventions meeting our criteria. Our final sample of 11 interventions includes the Perry and Abecedarian preschools, the Moving To Opportunity (MTO) intervention, Boston's no excuses charter schools, the Harlem Promise Academy charter school, Chicago's Noble Street Charter School, an elite boarding school in North-Carolina, a Conditional Cash Transfer program in NYC, a program giving private-schools vouchers in Washington DC, Early College HSs where students can earn college credits, and Sourdun. Table 4 below shows that of eight interventions for which ITT effects on HS graduation are available, Sourdun is the intervention with the second largest effect, both in absolute and in relative terms, after the Perry preschool. Of eight interventions for which effects on HE enrolment are available, Sourdun is the intervention with the largest absolute and relative effect. Of four interventions for which effects on HE graduation are available, Abecedarian and Sourdun are the only two interventions producing large and significant effects. Sourdun's absolute effect is comparable to that of Abecedarian. Its relative effect is smaller, as the HE graduation rate is very low in the Abecedarian control group, perhaps in part because that study only includes four-years bachelor degrees in its definition of HE graduation, while we also include two-or-three-years technical or vocational degrees. Excluding those degrees, Sourdun increases the HE graduation rate by 83.8%.[10] Interestingly, Sourdun increases years of schooling from 12.29 to 13.33, which is close to the effect of Abecedarian on that variable (from 12.31 to 13.46).[11] Overall, while we do not claim that our search is exhaustive,[12] it is still indicative that Sourdun's effects stand out.

[10] Another difference is that the HE graduation rate is self-reported in the Abecedarian study.

[11] Winners of the Harlem-Promise lottery spent three more years there than losers, a larger first-stage effect than Sourdun's. The long-run first-stage effect, in years of treatment, is not available for the other interventions.

[12] For instance, Deming et al. (2014) is an example of a study meeting our criteria that we did not retrieve in either of our two searches. In their Table 3 Column (1), the authors find positive but small and insignificant effects of attending one's preferred high school on college enrollment and graduation.

Table 3: Effects of a Sourdun offer on students' educational outcomes

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
High-school dropout	0.270	-0.142	0.049	395
High-school graduate	0.463	-0.017	0.064	395
Technical or vocational Bac	0.207	-0.079	0.044	395
General Bac	0.257	0.062	0.055	395
Ever enrolled in Higher Education (HE)	0.571	0.197	0.055	395
Ever enrolled in 2nd year of HE	0.453	0.123	0.055	395
Ever enrolled in 3rd year of HE	0.263	0.165	0.052	395
HE Graduate	0.267	0.159	0.056	395
Technical or vocational HE degree	0.045	-0.027	0.022	395
Non-selective university, STEMEL field	0.104	0.124	0.040	395
Non-selective university, other field	0.060	0.039	0.028	395
Grande Ecole, admission after CPGE	0.030	0.030	0.027	395
Grande Ecole, admission after HS	0.005	0.012	0.011	395
Other HE degree	0.024	-0.018	0.019	395
Years of schooling completed	12.294	1.034	0.304	395
Imputed earnings given highest degree	1443.291	152.779	60.464	395

Notes: The table reports results from OLS regressions of several dependent variables on a lottery-offer indicator, and the statistical controls listed in Section 2.4, with weights that follow De Chaisemartin & Behaghel (2020) to account for the waitlist randomization process. Column (1) reports the mean outcome in the control group, while Column (2) reports the coefficient on the indicator. Standard errors in Column (3) are clustered at the student level. Students' highest degree and years of schooling come from administrative data. Students' imputed earnings is computed matching their highest degree with the average wage of individuals with that degree and aged 30 to 35 in the 2013 to 2019 waves of the French Labor Force Survey. The three outcomes in bold are a coarse partition of students' highest degree. Outcomes in italics are nested in one of the outcomes in bold. Outcomes that are neither in bold or in italics are either intermediate outcomes towards students' highest degree, or summary outcomes of their education.

Table 4: Comparing the effects of Sourdun to that of other interventions

Panel A: High School completion			
Interventions	Control Mean	ITT Effect	Δ
Sourdun	0.730	0.142	19.5%
Perry Preschool	0.534	0.169	31.7%
Abecedarian Preschool	0.816	0.068	8.4%
Boston Charter Schools	0.787	-0.001	-0.1%
Harlem Promise Charter School	0.735	0.037	5.0%
NYC Conditional Cash Transfer	0.482	0.011	2.3%
DC Private-Schools Vouchers	0.700	0.120	17.1%
Early-College High Schools	0.806	0.054	6.7%
Panel B: Higher Education enrollment			
Interventions	Control Mean	ITT Effect	Δ
Sourdun	0.571	0.197	34.5%
Perry Preschool	0.297	0.063	21.1%
MTO, children treated before 13	0.165	0.025	15.2%
Boston Charter Schools	0.596	0.018	3.0%
Harlem Promise Charter School	0.422	0.055	13.0%
Chicago's Noble Street Charter School	0.588	0.100	17.0%
North-Carolina Elite Boarding School	0.920	0.048	5.2%
Early-College High Schools	0.705	0.092	13.0%
Panel C: Higher Education graduation			
Interventions	Control Mean	ITT Effect	Δ
Sourdun	0.267	0.159	59.6%
Abecedarian Preschool	0.061	0.170	278.7%
Chicago's Noble Street Charter School	0.149	0.007	4.7%
North-Carolina Elite Boarding School	0.600	0.013	2.2%

Notes: For the Perry Preschool, numbers come from Tables 6 and 8 in Anderson (2008). For the Abecedarian Preschool, numbers come from Table 3 in Campbell et al. (2012). For MTO, numbers come from Table 4 of Chetty et al. (2016). For the Boston Charter Schools, numbers come from Tables 4 and 7 in Angrist et al. (2016), multiplying the LATE estimates therein by the first stage to recover ITT estimates. For the Harlem Promise Charter School, numbers come from Table 4 in Dobbie & Fryer (2015). For the Chicago Noble Street Charter School, numbers come from Table 3 in Davis & Heller (2019). For the North-Carolina Elite Boarding School, ITT effects come from Table 4 Column (2) in Shi (2020), while control means are eye-balled from the paper's Figure 6. For the NYC Conditional Cash Transfer program, numbers come from Table 4.5 of Riccio et al. (2013). For the DC Private-Schools Voucher program, numbers come from Table 3.5 of Wolf et al. (2010). For the Early-College High Schools, numbers come from several graphs in Chapter 3 of Berger et al. (2013).

4 Heterogeneous effects on "minority" and "majority" students

Students with an immigrant background are an implicit target of the boarding school of excellence policy, so we now attempt to investigate Sourdun's effect on that subgroup. As we do not directly measure immigrant background, we use language spoken at home as a proxy, and label students living in a family where another language than French is spoken at home as minorities.

4.1 Defining "minority" and "majority" students

Language spoken at home as a proxy for students' minority status. In our parental questionnaire, we asked parents which language is spoken at home. They could either respond: (1) French exclusively; (2) another language exclusively; (3) mostly French but another language is used occasionally; (4) mostly another language but French is used occasionally. We define minority students as students whose parents gave answer (2), (3), or (4). 11% of parents did not answer our questionnaire, so we cannot construct our minority/majority proxy for their children. Among students for whom we can construct this variable, 55% are minority students according to our definition. We took the question we use to define minority/majority students, with the exact same wording and possible answers, from the questionnaire of a nationally representative survey, the "Panel d'élèves du second degré, 2007", conducted by the French MoE. Our parents' surveys were conducted in 2010, 2011, and 2012. We can thus compare our results to those in the 2011 wave of the survey, where parents of 35,000 grade 9 students were interviewed. While we interviewed only one parent per student, both parents were interviewed in that survey, and we define minority students as those such that at least one of their parents answered (2), (3), or (4) to the question above. According to this slightly less stringent definition, 20% of the students in the national survey are minority students. This share rises to 42% in deprived urban areas, where our study population is recruited.

Our definition of minority/majority students correlates well with parents' nationality and country of birth. In the nationally representative survey, parents were also asked whether they are French and whether they were born out of France.[13] As shown in Table 5, only 9% of students we define as majority based on language spoken at home have at least one non-French or foreign-born parent. On the other hand, 68% of students we define as minority have at least one non-French or foreign-born parent. Thus, our definition of minority students correlates well with one based on parents' nationality or country of birth. Most parents that are French and born in France but speak another language than French do so occasionally. This

[13]The survey does not provide detailed nationality or nationality of birth, so that we cannot analyze geographical origin more precisely.

may reflect an immigrant background dating back to their own parents or grand-parents.

Table 5: Defining immigrants based on language or country of birth

	Language-based definition:	
	Majority	Minority
At least one non-French or foreign-born parent	9%	68%
No non-French or foreign-born parent	91%	32%

Notes: The table uses data from the 2011 wave of the *Panel d'élèves du second degré, 2007*, a nationally representative survey conducted by the French MoE. Minority are students such that at least one of their parents reports that another language than French is spoken exclusively or occasionally at home.

4.2 Heterogeneity analysis

Table 6 below shows the estimated ITT effects of receiving an offer to join Sourdun on students' highest degree obtained, estimated separately among minority (first panel) and majority (second panel) students. Table 14 in the Appendix shows that results are robust to dropping statistical controls from the regression.[14] The number of observations sums to 353 rather than 395, because there are 42 students whose parents never answered our parental questionnaire, thus precluding us from inferring their minority/majority status.

A Sourdun offer has very large positive effects among minority students. Among minority students, receiving a Sourdun offer: divides the dropout rate by almost three, divides the proportion of students whose highest degree is a technical or vocational Bac by more than two, does not strongly affect the proportion of students whose highest degree is a general Bac, and increases the proportion of students who graduate from HE by 65%. Within HE degrees, receiving an offer slightly but insignificantly reduces the proportion of students getting a technical or vocational HE degree, and increases the proportion of students graduating from a non-selective university in a STEMEL field or in another field. Strikingly, receiving an offer very strongly increases the proportion of students graduating from a selective Grande Ecole, from 0 to 7.7%. Those effects translate into an increase in students' imputed earnings of 187.65 euros per month (s.e.=75.94), a 12.8% increase relative to the control-group mean. One might worry that minorities' discrimination on the labor market could reduce Sourdun's effective earnings effect in that group. To account for that, we recompute our imputed earnings outcome, using individuals' highest degree and majority/minority background to predict wages from the French

[14] Appendix Table 15 shows that results are also robust to clustering standard errors at the lottery level, as considered in De Chaisemartin & Behaghel (2020).

labor force surveys. Doing so yields a similar imputed earnings effect of Sourdun for minority students (+196.00, s.e.=79.01).

A Sourdun offer has more nuanced effects among majority students. Among majority students, receiving a Sourdun offer: divides the dropout rate by two, does not strongly affect the proportion of students whose highest degree is a technical or vocational Bac, increases by 77% the proportion of students whose highest degree is a general Bac, and increases the proportion of students who graduate from HE by 46%. Within HE degrees, receiving an offer slightly increases the proportion of students getting a technical or vocational HE degree, almost triples the proportion of students graduating from a non-selective university in a STEMEL field, slightly reduces the proportion of students graduating from a non-selective university in another field, and reduces the proportion of students graduating from a selective Grande Ecole. Those effects translate into an insignificant increase in students' imputed earnings of 98.45 euros (s.e.=97.26), a 6.8% increase relative to the control-group mean.

Summarizing, and testing for, heterogeneous effects. Both minority and majority students experience a 23 pp reduction in the proportion of students that are either HS drop-outs or technical-or-vocational-Bac graduates. Among majority students, this mirrors equal increases in the proportion of general-Bac graduates and HE graduates, while among minority students the proportion of HE graduates increases much more than the proportion of general-Bac graduates. Minority students experience a large increase in their graduation rate from elite "Grandes Ecoles", an effect that is not present for majority students. All this leads to very different imputed-earnings effects for the two groups, though the difference is not statistically significant. To test whether the effects on minorities' and majorities' highest degree differ, we run a joint chi-squared test that the effects on the nine mutually exclusive degrees in Table 3 are equal for minority and majority students. The null is marginally rejected (p-value=0.054).

Other heterogeneity analyses. Tables 16, 17, and 18 in the Appendix respectively show the effects along the heterogeneity dimensions we had presented in Behaghel et al. (2017) and in our policy report on Sourdun's short-term effects (see Behaghel et al. 2013): students in/out of the top tercile of teachers' math grades at baseline, boys vs. girls, and students who applied to join Sourdun in middle vs. in high school. The effect on imputed earnings is 41% larger among students in the top tercile of math grades at baseline than among students in the bottom two terciles, but the p-value of the chi-squared test that effects are the same is equal to 0.171. Some effects are larger for boys than for girls (for instance, Sourdun almost doubles the HE graduation rate among boys, and increases it by 30% among girls), but the effects on imputed earnings are very close in the two subgroups, and the p-value of the chi-squared test that effects are the same is equal to 0.395. Effects on imputed earnings are also very close for middle and high school

applicants, and the p-value of the chi-squared test that effects are the same is equal to 0.623.

4.3 Why do minority students benefit so much from Sourdun?

In this section, we investigate why minority students benefit so much from a Sourdun offer. Table 6 suggests that differential program take up between minorities and majorities cannot account for this difference: while the first-stage effect of a Sourdun offer on the number of years spent there is 22.5% larger among minority students, their imputed-earnings effect is 90.6% larger. We now investigate three other, non-mutually exclusive explanations: minority and majority students differ on other observable characteristics correlated to Sourdun's effect; minority and majority students experience heterogeneous short-run effects, which then translate into heterogeneous long-run effects; Sourdun has differential effects on the progression into secondary and higher education of minority and majority students. As with any type of mechanisms' analysis, results remain suggestive, all the more so here due to the small sample size.

4.3.1 Different baseline characteristics of minority and majority students?

Minority students come from lower socio-economic-status families, and may have higher levels of academic ability. In Table 7, we compare the baseline characteristics of minority and majority students. We also compare those two groups on some of the outcomes we collected one and two years after the lottery, then restricting attention to control group students. Panel A shows that minority students come from lower socio-economic-status (SES) families. When they apply, the parent listed as the first contact person in their school registry is 22.1 pp more likely to be considered as "low SES" according to the French MoE, a category that groups together blue collar workers, clerks, unemployed, inactive, and retired parents. Among minority students, the parent that responded to our parental questionnaire is 19.6 pp less likely to have completed high school than among majority students. Minority students are also 15.5 pp more likely to be recipients of the means-tested grant for secondary school students.[15] Turning to academic ability, Panel B shows that minorities' baseline grade in maths in their sending school is 0.33σ higher than that of majorities', while their baseline grade in French is not different. At the same time, the peers of minority students in those schools have lower French and math grades. This suggests that minority students come from worse schools, consistent with the fact that they belong to lower SES families. This also implies that their relative position in their class is higher than that of majority students, especially in maths. As teachers may, at least to some extent, grade students relatively to the rest of the class, the difference between the math grades of minority and majority students could mix a difference in academic ability and a

[15]This variable is an imperfect proxy for income, as a substantial fraction of eligible families do not claim this grant, its amount being low and the application procedure costly.

Table 6: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among minority and majority students

	Control Mean (1)	T-C (2)	s.e. (3)	N (4)
Minority students				
Years spent in Sourdun	0.554	2.361	0.259	193
High-school dropout	0.207	-0.132	0.059	193
Technical or vocational Bac	0.178	-0.106	0.048	193
General Bac	0.333	0.055	0.086	193
Higher Education (HE) Graduate	0.282	0.183	0.082	193
Technical or vocational HE degree	0.062	-0.049	0.032	193
Non-selective university degree, STEMEL field	0.135	0.112	0.068	193
Non-selective university degree, other field	0.032	0.072	0.039	193
Selective Grande Ecole	0	0.077	0.026	193
Predicted monthly earnings given highest degree	1460.407	187.654	75.942	193
Majority students				
Years spent in Sourdun	0.280	1.927	0.242	160
High-school dropout	0.302	-0.173	0.080	160
Technical or vocational Bac	0.294	-0.057	0.090	160
General Bac	0.145	0.111	0.067	160
Higher Education (HE) Graduate	0.259	0.119	0.082	160
Technical or vocational HE degree	0	0.031	0.018	160
Non-selective university degree, STEMEL field	0.069	0.133	0.056	160
Non-selective university degree, other field	0.106	-0.020	0.051	160
Selective Grande Ecole	0.084	-0.044	0.051	160
Predicted monthly earnings given highest degree	1454.527	98.453	97.261	160
P-value effect highest degree minority=majority	0.054			

Notes: The table reports results from OLS regressions of several dependent variables on a lottery-offer indicator, and the statistical controls listed in Section 2.4, with weights that follow De Chaisemartin & Behaghel (2020), estimated separately among minority (first panel) and majority (second panel) students. Column (1) reports the mean outcome in the control group, while Column (2) reports the coefficient on the indicator. Standard errors in Column (3) are clustered at the student level. Students' highest degree and years of schooling come from administrative data. Students' imputed earnings is computed as in Table 3. Outcomes nested in other outcomes are italicized. The p-value at the bottom of the table comes from a chi-squared test testing jointly that effects on all mutually-exclusive degrees are the same for minority and majority students.

difference in within-class rank. Indeed, when we compare, in the control group, the performance of minority and majority students at our standardized tests, we still find that minority students perform slightly better, but the difference is smaller than on school grades, and insignificant.

Minority students have lower levels of social self-esteem, and their parents have more ambition for them. Moving to socio-emotional traits, Panel C of Table 7 shows that at baseline, minority students receive higher behavior grades from their teacher, though this difference could again be due to a within-class-rank effect. In the control group, minority students have significantly lower social self-esteem scores, a difference we will return to later. On the other hand, the two groups do not have different well-being, academic self-esteem, and general self-esteem scores. Finally, Panel D shows that parents of minority students have more academic ambition for the HE careers of their children: our HE-ambition score is 0.433σ higher among them, though the difference is marginally significant. On the other hand, majority and minority students do not have different levels of motivation for schooling and HE ambition.

The differences between the baseline characteristics of minority and majority students cannot account for minorities' larger effects. To assess if the differences between the baseline characteristics of minority and majority students can account for minorities' larger effects, we conduct the following exercise. First, we select the six baseline student characteristics in Table 7 on which minority and majority students significantly differ at the 10% level: whether the student's parent is low SES, whether the student is a means-tested grant recipient, the number of children in the family, whether the student's parent completed high school, and the maths and behavior grade they receive from their teacher at baseline. We do not include peers' characteristics, and cannot include variables measured after the randomization. Second, we regress students' imputed earnings on those six characteristics, separately in the treatment and control groups. Third, we compute the prediction and residual of imputed earnings from these regressions. Fourth, we estimate Sourdun's ITT effect on students' predicted imputed earnings, and on students' residual imputed earnings, separately for minority and majority students. Standard errors are computed by bootstrapping steps two to four of the estimation procedure. Those standard errors do not account for the statistical uncertainty in the selection of the predictors, step one of our procedure, so results remain tentative. Table 8 below shows that differences between the baseline characteristics of minority and majority students cannot account for minorities' larger effects. If anything, based on their baseline characteristics, majority students should experience larger effects than minority students, though the difference is not statistically significant. Therefore, Sourdun's differential effect between the two groups cannot be predicted by basic measures of social origin and school performance.

Table 7: Comparison of minority and majority students

	Majority	Minority-Majority	s.e.	Observations
(A) Gender Socio Economic Background				
Boy	0.449	-0.069	0.063	353
Parent low SES	0.324	0.221	0.063	351
Recipient of means tested grant	0.380	0.155	0.063	351
Number of children in the family	2.519	0.686	0.205	351
Single-parent family	0.396	-0.059	0.060	352
Parent completed high school	0.499	-0.196	0.066	326
(B) Academic Ability				
Teacher grade in French	0.018	0.046	0.132	351
Teacher grade in math	-0.169	0.333	0.131	351
Peers' grade in French	0.352	-0.371	0.172	336
Peers' grade in math	0.126	-0.306	0.140	336
French score (control group)	0.005	0.126	0.299	118
Maths score (control group)	0.029	0.160	0.252	118
(C) Socio-emotional Traits				
Teacher behavior grade	-0.073	0.225	0.133	308
Peers' behavior grade	-0.065	-0.200	0.131	291
Well-being score (control group)	-0.017	-0.159	0.224	112
Academic self-esteem score (control group)	0.005	-0.112	0.303	118
Social self-esteem score (control group)	0.302	-0.631	0.312	118
General self-esteem score (control group)	-0.084	-0.055	0.303	118
(D) Motivation for Schooling and Ambition				
Student school-motivation score (control group)	-0.168	0.088	0.215	118
Student HE-ambition score (control group)	0.066	0.020	0.268	118
Parent HE-ambition score (control group)	-0.229	0.433	0.265	106

Notes: The table reports results from OLS regressions of several dependent variables on an indicator for minority students. Column (1) reports the mean outcome in the control group, while Column (2) reports the coefficient on the indicator. Standard errors in Column (3) are clustered at the student level. Some variables were collected at the time of randomization, while other variables were collected one and/or two years after randomization. For variables collected after randomization, the regression is estimated in the control group only.

Table 8: Can differences in baseline characteristics account for the differential long-run effects of minority and majority students?

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
		A. Minority		
Predicted imputed earnings	1496.940	76.909	67.294	193
Residual imputed earnings		110.746	61.884	193
		B. Majority		
Predicted imputed earnings	1370.458	197.366	59.907	160
Residual imputed earnings		-98.913	78.215	160

Notes: Analysis to predict treatment effect on imputed earnings for minority (Panel A) and majority (Panel B) students, based on their baseline characteristics. The six predictors used are whether the student's parent is low SES, whether the student is a means-tested grant recipient, the number of children in the family, whether the student's parent completed high school, and the baseline maths and behavior grade students received from their teacher. Imputed earnings are regressed on those variables, separately in the treatment and in the control group. Then, we estimate the treatment's effect on the predicted outcome from these regressions, and on the residual. Standard errors in Column (3) are obtained by bootstrapping the estimation procedure.

4.3.2 Different short-term effects on minority and majority students?

Sourdun already had larger effects on minority than majority students two years after the lottery. In Table 9 below, we compare the short-run effects of Sourdun (two years after the lottery), on most of the outcomes we had looked at in Tables 4 to 9 of Behaghel et al. (2017). We exclude students' well-being score, as this outcome was not measured for the first cohort of students who applied to Sourdun, and is therefore missing for half of students. We also group together time-use outcomes into a standardized "homework-time" index. The table shows that a Sourdun offer improves relations with teachers more for minority than for majority students, but effects are positive in both subgroups, and not significantly different across the two subgroups. On the other hand, a Sourdun offer increases the homework index of minority students by 0.773σ, while it does not have any effect on the homework index of majority students, and effects are significantly different between the two groups (t-stat=2.717). Similarly, a Sourdun offer increases minority students' maths scores by 0.425σ, and does not have an effect on the maths scores of majority students, and effects are significantly different between the two groups at the 10% level (t-stat=1.818). Finally, a Sourdun offer increases the self-esteem score of minority students by 0.622σ, while it insignificantly reduces the self-esteem score of majority students, and the difference is significant (t-stat=2.739).

Differential short-term effects can predict a large share of the differential long-term effects between minority and majority students. To investigate if minorities' larger short-run effects can predict their larger long-run effects, we conduct the following exercise. First, we start by running a regression of students' imputed earnings on short-term outcomes in the control group, restricting attention to students' homework index, maths score, and self-esteem index, the short-term outcomes for which minority and majority students experience significantly different effects. Second, we compute the predicted outcome and residuals of this regression, for treatment and control group students. For each of the three predictors, we also compute a variable equal to its regression coefficient multiplied by the variable. Third, we estimate Sourdun's ITT effect on students' predicted imputed earnings, on students' residual imputed earnings, and on the three predictor-specific variables, separately for minority and majority students. Standard errors are computed bootstrapping steps two and three of the estimation procedure, and do not account for the statistical uncertainty in the variables' selection. Panel A of Table 10 shows that short-term effects can account for almost two-thirds of minorities' imputed-earnings effect. Effects on students' maths score and self-esteem each account for roughly 40% of this predicted effect, while the homework index contributes less. The total predicted effect is statistically significant, while only the maths score's contribution is marginally significant at the 10% level. The residual effect is not statistically significant. On the other hand, Panel B of Table 10 shows that the predicted long-term effect of majority students is small and insignificant, which is unsurprising as

Table 9: Effects of Sourdun on minority and majority students two years after the lottery

	Majority			Minority			Maj-Min	N
	CM	T-C	s.e.	CM	T-C	s.e.	T-stat	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
School attendance index	-0.061	-0.123	0.209	-0.012	0.197	0.170	1.187	330
Classroom disruption index	0.111	-0.586	0.253	0.161	-0.623	0.212	-0.113	329
Students' relations index	0.040	0.392	0.192	-0.055	0.645	0.192	0.931	259
Teachers' involvement index	0.014	0.612	0.276	-0.162	1.102	0.201	1.431	330
Relations with teachers index	-0.114	0.472	0.228	-0.102	0.827	0.162	1.271	316
Relations with supervisor index	-0.192	-0.193	0.219	-0.119	-0.190	0.179	0.011	260
Homework index	0.207	0.013	0.194	-0.134	0.773	0.202	2.717	327
Maths score	-0.069	0.018	0.154	0.177	0.425	0.162	1.818	332
French score	0.020	-0.010	1.170	0.256	-0.302	0.203	-1.102	336
Self-esteem score	0.074	-0.288	0.244	-0.334	0.622	0.226	2.739	331
Motivation score	-0.077	0.163	0.198	-0.180	0.598	0.226	1.447	331

Notes: The table reports results from OLS regressions of several dependent variables on a lottery-offer indicator, and the statistical controls listed in Section 2.4, with weights that follow De Chaisemartin & Behaghel (2020) to account for the waitlist randomization process. Regressions are estimated separately among majority students (Columns (1) to (3)) and among minority students (Columns (4) to (6)). Column (7) shows the t-statistic from a test that effects are equal in the two groups. All outcome variables are measured two years after the lottery.

this group does not experience a significant effect on these three outcomes. Majorities' residual effect is large but insignificant, in line with the fact that this group does not have a significant effect on imputed earnings. Overall, differential short-term effects can account for a large share of the differential long-run effects between the two groups.

Table 10: Can differential short-term effects account for the differential long-run effects of minority and majority students?

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
		A. Minority		
Predicted imputed earnings	1441.556	117.761	53.809	193
Homework Index		16.155	26.979	193
Maths score		47.350	28.767	193
Self-esteem Index		54.256	38.632	193
Residual imputed earnings		69.893	88.822	193
		B. Majority		
Predicted imputed earnings	1452.202	-15.551	35.985	160
Homework Index		0.168	8.580	160
Math score		9.549	22.340	160
Self-esteem Index		-25.268	30.334	160
Residual imputed earnings		114.004	84.449	160

Notes: Analysis to predict treatment effect on imputed earnings for minorities (Panel A) and majorities (Panel B), based on Sourdun's short-run outcomes. The three predictors are an index of homework, students' math scores, and an index of self-esteem. All are measured 2 years after the lottery. Standard errors in Column (3) are obtained by bootstrapping the estimation procedure.

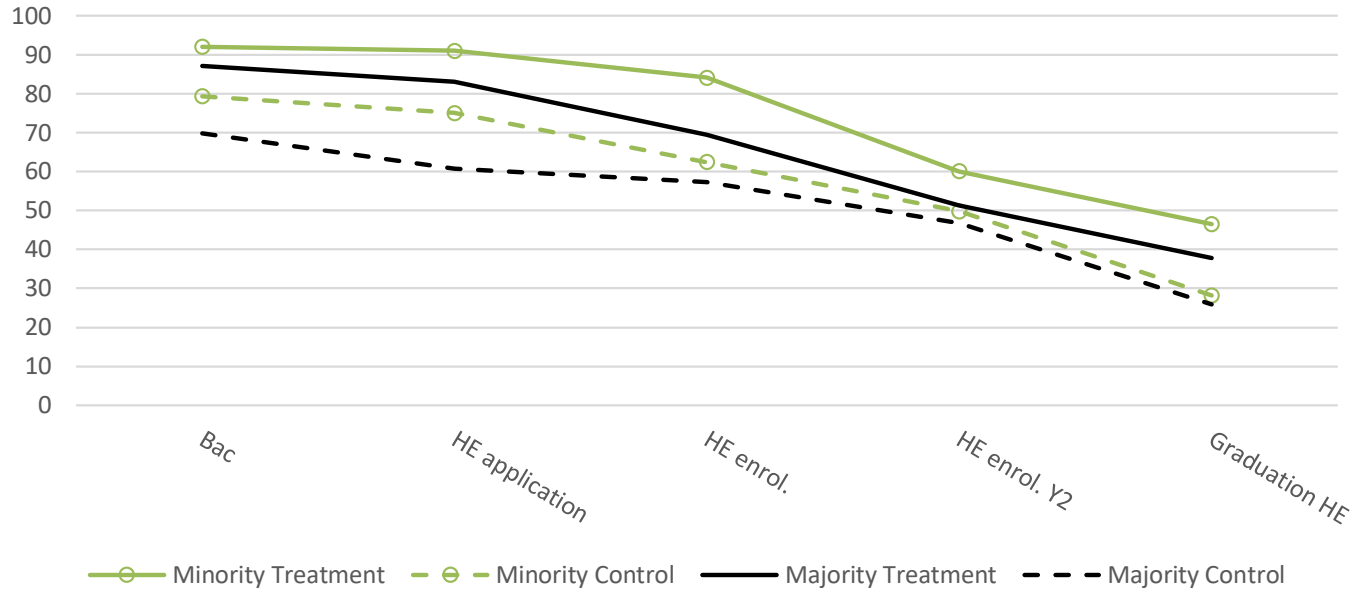
4.3.3 Lifting barriers that would otherwise prevent minorities from fulfilling their HE ambitions?

Minorities, in the general population and in our control group, have more ambition, enroll more in HE, but do not graduate more. Table 11 presents regressions estimated in the nationally representative survey mentioned above, where the explanatory variables are an indicator for minority students (Column (1)), students' cognitive score at the end of 9th grade (Column (2)), and an intercept (Column (3)). The score is centered and normalized, so that the coefficient in Column (1) can be interpreted as the pp difference between minority and majority students at the average cognitive score, while the intercept in Column (3) can be interpreted as the average for majority students at the average cognitive score. We restrict the sample to students that live in deprived urban areas to make it more comparable to our study population. Panel A shows that minority parents are 10.6 pp more likely to ask that their child join an academic (as opposed to professional) high school at the end of middle school, and they are also 13.4 pp more likely to say that they would like that their child enroll in HE. This second difference is remarkably large, as it corresponds to the "effect" of a 1σ increase in the cognitive score. In our study population, where minorities and majorities have approximately the same levels of academic ability, we see the same pattern: minorities' parents have more ambition for their children, as shown in Panel D of Table 7. Possibly as a result of this stronger ambition, Panel B of Table 11 shows that conditional on cognitive scores, in the general population minorities are more likely to obtain the Bac, and to enroll in HE. However, while both groups have large HE dropout rates, that of minority students is even larger, so they end up with a HE graduation rate that is not different.[16] Again, we find a similar pattern in our study population. Looking at Figure 2, and comparing the dashed lines for minority and majority students in the control group, we see that minority students are 9.5 pp more likely to obtain the Bac, 14.2 pp more likely to apply for HE, but only 2.3 pp more likely to graduate.

In the treatment group, minorities outperform majorities at all stages of students' progression into secondary and higher education. The solid lines in Figure 2 show that like in the control group and in the general population, minority students experience better HS outcomes (Bac and HE application) in the treatment group. But unlike what happens in the control group, the gap does not gradually close down on the way to HE graduation: even at that stage, there remains a 9 pp gap between minorities and majorities. Thus, Sourdun seems to lift some barriers that would otherwise prevent minorities from fulfilling their ambition. In the US, Card & Giuliano (2016) find that "high-achiever classrooms" have large effects on Black

[16] We restrict the general population sample to students in deprived areas to make it more comparable to our study population. However, the higher ambition and the better educational outcomes of the minority population until the end of HS, conditional on cognitive performance, is also present without that restriction, and is also documented in Guyon & Huilery (2021) and Vallet & Caille (1996).

Figure 2: Minorities and majorities progression into secondary and tertiary education



Notes: The figure shows students' progressions into secondary and higher education, separately for treatment and control students, and for minority and majority students. For control-group students, numbers are just the average of the variable under consideration in the control group. For treatment-group students, an estimator of the ITT effect, computed as all ITT effects in the paper, is added to the control-group average. ITT effects for each outcome, as well as their estimated standard errors, are shown in Table 20 in the Appendix.

and Hispanic students and no effects on White students. The authors hypothesize that "higher-ability minority students face obstacles in the regular classroom environment (...) and that some of these obstacles –including low teacher expectations and negative peer pressure– are reduced or eliminated" in a high-achiever class. Similar mechanisms may be at play here. Table 9 shows that the effect of Sourdun on a teacher-student relationship index, measuring students' agreement with statements like "Teachers care for students" or "Teachers give supplementary help if needed", is twice as large for minorities than for majorities. Thus, Sourdun dramatically changes minorities' perception of being understood by their teachers, while it has a more nuanced effect for majorities on that dimension. Turning to peers' influences, Panel C of Table 7 shows that in the control group, minority students have significantly lower social self-esteem scores, which measure students' perception of their popularity and ability to make friends. Thus, when they are outside of Sourdun, the students in our study, whose grades are above their classes' average, are more at odds with their peers in the minority than in the majority group. This could be due to the fact that minority students are slightly higher ability than majority ones, and come from worst schools, thus leading to a greater distance between them and their classmates. It may also be the case that being academically oriented is even less popular among minority teenagers.

Sourdun completely changes that: Table 9 shows while it has a negative and insignificant effect on the overall (social, academic and general) self-esteem of majorities, it increases that of minorities by 0.62σ.[17]

5 Conclusion

This paper uses an RCT to study the effect of a boarding school in France, a country with low social-mobility and high educational inequalities, on the highest completed degree of low SES students. We find large effects, comparable to those of celebrated preschool interventions, which is surprising in view of the school's unremarkable short-run effects on students' test scores. The school's effects are larger among students who speak another language than French at home, referred to as minorities. Notably, their access to the French elite graduate school system improves considerably. In our control group, and in a general population survey as well, minority parents have more ambition, conditional on test scores, and accordingly their children perform better all the way till HE enrollment. Yet, minorities experience a very large HE dropout rate, and they do not end up graduating more. The boarding school lifts barriers that otherwise prevent minorities from fulfilling their ambitions: in our treatment group, minorities achieve better outcomes through to HE graduation. The boarding school has short-run effects on minorities' maths test-scores, self-esteem, and homework time. A simple decomposition suggests that its effect on minorities' trajectories is a combination of its effect on their cognitive and socio-emotional resources. This is consistent with recent work by Jackson et al. (2024), who find that in the US, schools' *overall* value added, both on students' cognitive and socio-emotional scores, has a larger effect on the long-run outcomes of disadvantaged students than schools' value added on cognitive scores only.

[17] Results are similar if we restrict attention to social self-esteem, as in Panel C of Table 7.

Table 11: Differences between aspirations and schooling outcomes of minorities and majorities, conditional on cognitive scores, in the general population

	Minority (1)	Cog. score (2)	Intercept (3)	N
(A) Aspiration				
Request Academic HS	0.106	0.274	0.602	2,471
	(0.019)	(0.007)	(0.012)	
Would like child to enroll in HE	0.134	0.134	0.724	2,187
	(0.021)	(0.010)	(0.013)	
(B) Schooling outcomes				
Any Bac	0.086	0.224	0.779	2,471
	(0.019)	(0.008)	(0.011)	
Enroll in HE	0.148	0.255	0.619	1,277
	(0.037)	(0.013)	(0.020)	
HE Graduate (within 4 years of Bac)	0.030	0.161	0.387	1,277
	(0.032)	(0.013)	(0.019)	

Notes: The table reports coefficients from OLS regressions of several dependent variables on an indicator for minorities (Column (1)), and a standardized cognitive score measured at the end of 9th grade (Column (2)). The sample is representative of the cohort of students entering middle school in France in 2007 (*Panel d'élèves du second degré 2007, French MoE*), and is followed throughout secondary and tertiary education. We restrict the sample to students in deprived urban areas (*Zones urbaines sensibles*), to increase the comparability with our study population. The sample size is smaller for the HE variables, because of substantial attrition out of the sample at that point. We use the weights provided by the MoE to correct for attrition. The minority indicator is defined as in the rest of the paper. "Request Acad. HS" is equal to one if the family has requested an academic (instead of vocational) HS at the end of their child's middle school; "Would like child to enroll HE" is equal to one if parents declare at the end of middle school that they would like the child to enroll in higher education. Robust standard errors are shown in parentheses.

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A Appendix

Table 12: Effects of a Sourdun offer on students' highest degree obtained, years of schooling completed and imputed earnings (dropping statistical controls)

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
Highest degree obtained				
High school dropout	0.270	-0.117	0.051	395
High school graduate	0.463	-0.027	0.066	395
Technical or vocational Bac	0.207	-0.069	0.054	395
General Bac	0.257	0.041	0.062	395
Ever enrolled in Higher Education (HE)	0.571	0.160	0.061	395
Ever enrolled in 2nd year of HE	0.453	0.086	0.066	395
Ever enrolled in 3rd year of HE	0.263	0.143	0.055	395
Higher education (HE) Graduate	0.267	0.144	0.056	395
Technical or vocational HE degree	0.045	-0.025	0.023	395
Non-selective university degree, STEMEL field	0.104	0.120	0.039	395
Non-selective university degree, other field	0.060	0.033	0.027	395
Grande Ecole admitting students after a CPGE	0.030	0.026	0.025	395
Grande Ecole admitting students after HS	0.005	0.011	0.010	395
Other HE degree	0.024	-0.021	0.023	395
Years of schooling and imputed earnings				
Years of schooling completed	12.294	0.881	0.308	395
Predicted monthly earnings given highest degree	1443.291	132.758	59.391	395

Table 13: Effects of a Sourdun offer on students' highest degree obtained, years of schooling completed and imputed earnings (clustering standard errors at lottery level)

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
Highest degree obtained				
High-school dropout	0.270	-0.142	0.060	395
High-school graduate	0.463	-0.017	0.085	395
Technical or vocational Bac	0.207	-0.079	0.051	395
General Bac	0.257	0.062	0.054	395
Ever enrolled in Higher Education (HE)	0.571	0.197	0.075	395
Ever enrolled in 2nd year of HE	0.453	0.123	0.073	395
Ever enrolled in 3rd year of HE	0.263	0.165	0.082	395
Higher education (HE) Graduate	0.267	0.159	0.062	395
Technical or vocational HE degree	0.045	-0.027	0.015	395
Non-selective university degree, STEMEL field	0.104	0.124	0.050	395
Non-selective university degree, other field	0.060	0.039	0.034	395
Grande Ecole admitting students after a CPGE	0.030	0.030	0.025	395
Grande Ecole admitting students after HS	0.005	0.012	0.008	395
Other HE degree	0.024	-0.018	0.018	395
Years of schooling and imputed earnings				
Years of schooling completed	12.294	1.034	0.336	395
Predicted monthly earnings given highest degree	1443.291	152.779	50.380	395

Table 14: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among minority and majority students (dropping statistical controls)

	Control Mean	T-C	s.e.	N
Minority students				
High school dropout	0.207	-0.118	0.062	193
Technical or vocational Bac	0.178	-0.086	0.062	193
General Bac	0.333	0.030	0.094	193
Higher education (HE) Graduate	0.282	0.174	0.081	193
Technical or vocational HE degree	0.062	-0.056	0.037	193
Non-selective university degree, STEMEL field	0.135	0.128	0.060	193
Non-selective university degree, other field	0.032	0.064	0.033	193
Selective Grande Ecole	0	0.074	0.023	193
Predicted monthly earnings given highest degree	1460.407	172.787	75.006	193
Majority students				
High-school dropout	0.302	-0.135	0.093	160
Technical or vocational Bac	0.294	-0.088	0.109	160
General Bac	0.145	0.108	0.070	160
Higher education (HE) Graduate	0.259	0.115	0.091	160
Technical or vocational HE degree	0	0.032	0.016	160
Non-selective university degree, STEMEL field	0.069	0.129	0.055	160
Non-selective university degree, other field	0.106	-0.020	0.052	160
Selective Grande Ecole	0.084	-0.043	0.061	160
Predicted monthly earnings given highest degree	1454.527	86.437	117.618	160
P value chi 2	0.079			

Table 15: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among minority and majority students (clustering standard errors at the lottery level)

	Control Mean	T-C	s.e.	N
Minority students				
High school dropout	0.207	-0.132	0.074	193
Technical or vocational Bac	0.178	-0.106	0.059	193
General Bac	0.333	0.055	0.090	193
Higher education (HE) Graduate	0.282	0.183	0.090	193
Technical or vocational HE degree	0.062	-0.049	0.025	193
Non-selective university degree, STEMEL field	0.135	0.112	0.078	193
Non-selective university degree, other field	0.032	0.072	0.035	193
Selective Grande Ecole	0	0.077	0.018	193
Predicted monthly earnings given highest degree	1460.407	187.654	77.438	193
Majority students				
High school dropout	0.302	-0.173	0.103	160
Technical or vocational Bac	0.294	-0.057	0.092	160
General Bac	0.145	0.111	0.049	160
Higher education (HE) Graduate	0.259	0.119	0.068	160
Technical or vocational HE degree	0	0.031	0.020	160
Non-selective university degree, STEMEL field	0.069	0.133	0.057	160
Non-selective university degree, other field	0.106	-0.020	0.052	160
Selective Grande Ecole	0.084	-0.044	0.054	160
Predicted monthly earnings given highest degree	1454.527	98.453	50.130	160
P value chi 2	0.029			

Table 16: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among students belonging to bottom two terciles of the baseline test-score distribution and those belonging to the topmost tercile

	Control Mean	T-C	s.e.	N
Bottom two terciles				
High school dropout	0.313	-0.151	0.064	257
Techical or vocational Bac	0.273	-0.135	0.059	257
General Bac	0.176	0.141	0.061	257
Higher education (HE) Graduate	0.239	0.145	0.062	257
Technical or vocational HE degree	0.054	-0.023	0.027	257
Non-selective university degree, STEMEL field	0.064	0.122	0.042	257
Non-selective university degree, other field	0.074	0.019	0.036	257
Selective Grande Ecole	0.004	0.047	0.020	257
Predicted monthly earnings given highest degree	1394.694	138.128	58.523	257
Topmost tercile				
High school dropout	0.177	-0.127	0.059	138
Techical or vocational Bac	0.067	-0.016	0.049	138
General Bac	0.428	-0.075	0.098	138
Higher education (HE) Graduate	0.328	0.217	0.106	138
Technical or vocational HE degree	0.025	-0.012	0.024	138
Non-selective university degree, STEMEL field	0.189	0.113	0.092	138
Non-selective university degree, other field	0.032	0.090	0.051	138
Selective Grande Ecole	0.083	-0.003	0.055	138
Predicted monthly earnings given highest degree	1546.264	194.847	115.863	138
P value chi 2	0.171			

Table 17: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among boys and girls

	Control Mean	T-C	s.e.	N
Girls				
High school dropout	0.258	-0.149	0.058	231
Technical or vocational Bac	0.140	-0.023	0.044	231
General Bac	0.279	0.082	0.073	231
Higher education (HE) Graduate	0.323	0.090	0.071	231
Technical or vocational HE degree	0.038	-0.021	0.025	231
Non-selective university degree, STEMEL field	0.157	0.050	0.056	231
Non-selective university degree, other field	0.103	0.017	0.047	231
Selective Grande Ecole	0.016	0.034	0.024	231
Predicted monthly earnings given highest degree	1445.053	118.149	61.974	231
Boys				
High school dropout	0.285	-0.116	0.093	164
Techical or vocational Bac	0.300	-0.168	0.090	164
General Bac	0.225	0.105	0.078	164
Higher education (HE) Graduate	0.189	0.178	0.086	164
Technical or vocational HE degree	0.055	-0.040	0.038	164
Non-selective university degree, STEMEL field	0.029	0.159	0.049	164
Non-selective university degree, other field	0	0.086	0.032	164
Selective Grande Ecole	0.049	0.020	0.052	164
Predicted monthly earnings given highest degree	1440.810	127.833	111.534	164
P value chi 2	0.395			

Table 18: Effects of a Sourdun offer on students' highest degree obtained and imputed earnings, among students who applied for middle school and those who applied for high school

	Control Mean	T-C	s.e.	N
Applied for middle school				
High school dropout	0.372	-0.202	0.079	186
Techical or vocational Bac	0.196	-0.032	0.061	186
General Bac	0.216	0.048	0.077	186
Higher education (HE) Graduate	0.216	0.187	0.084	186
Technical or vocational HE degree	0.083	-0.039	0.044	186
Non-selective university degree, STEMEL field	0.055	0.167	0.051	186
Non-selective university degree, other field	0.029	0.077	0.035	186
Selective Grande Ecole	0.049	-0.019	0.049	186
Predicted monthly earnings given highest degree	1358.324	156.665	101.253	186
Applied for high school				
High school dropout	0.178	-0.133	0.049	209
Techical or vocational Bac	0.216	-0.099	0.051	209
General Bac	0.292	0.067	0.081	209
Higher education (HE) Graduate	0.313	0.165	0.083	209
Technical or vocational HE degree	0.012	-0.014	0.014	209
Non-selective university degree, STEMEL field	0.147	0.118	0.062	209
Non-selective university degree, other field	0.088	0.010	0.046	209
Selective Grande Ecole	0.012	0.060	0.031	209
Predicted monthly earnings given highest degree	1518.908	153.192	82.139	209
P value chi 2	0.623			

Table 19: Effects of a Sourdun offer on students' educational outcomes (dropping youngest admission cohorts)

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
High-school dropout	0.279	-0.162	0.052	347
High-school graduate	0.451	-0.018	0.070	347
Technical or vocational Bac	0.186	-0.068	0.045	347
General Bac	0.265	0.050	0.060	347
Ever enrolled in Higher Education (HE)	0.568	0.214	0.056	347
Ever enrolled in 2nd year of HE	0.460	0.131	0.057	347
Ever enrolled in 3rd year of HE	0.265	0.185	0.058	347
HE Graduate	0.271	0.180	0.062	347
Technical or vocational HE degree	0.035	-0.023	0.022	347
Non-selective university, STEMEL field	0.109	0.132	0.045	347
Non-selective university, other field	0.060	0.043	0.031	347
Grande Ecole, admission after CPGE	0.034	0.034	0.030	347
Grande Ecole, admission after HS	0.006	0.013	0.012	347
Other HE degree	0.027	-0.021	0.022	347
Years of schooling completed	12.334	1.144	0.338	347
Imputed earnings given highest degree	1453.331	174.150	67.929	347

Table 20: Trajectories of minorities and majorities (Figure 2)

	Control Mean	T-C	s.e.	N
	(1)	(2)	(3)	(4)
Minority students				
Bac	0.793	0.127	0.059	193
HE application	0.750	0.160	0.064	193
HE enrollment	0.624	0.217	0.076	193
HE enrollment Y2	0.498	0.103	0.079	193
HE graduate	0.282	0.183	0.082	193
Majority students				
Bac	0.698	0.173	0.080	160
HE application	0.608	0.223	0.080	160
HE enrollment	0.573	0.121	0.075	160
HE enrollment Y2	0.468	0.045	0.081	160
HE graduate	0.259	0.119	0.082	160