

TERTIARY EDUCATION AND FINANCIAL AID ASSISTANCE: EVIDENCE FROM AN INFORMATION EXPERIMENT*

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Abstract

Understanding the role of preferences, attitudes, and future expectations among disadvantaged students seems crucial in explaining their investment decisions in higher education. Indeed, perceptions about the consumption value of education may explain a substantial share of the variation in students' ability to continue their studies, influencing their probability of finding a job. We conduct a field experiment with university students in Emilia-Romagna who benefit from financial aid assistance to enroll in tertiary education offered by the regional public system. Our preliminary results suggest that stressing the importance of maintaining the public grants has a much larger impact on different outcomes (career, part-time, and so on) than the one related to the alternative message about the importance of graduating from college. Heterogeneity analysis allows different conclusions in this perspective while disentangling the contributions of some channels (wealth, social background, family environment) influences students' beliefs.

JEL codes: A23; C93; D63; I24

Keywords: low-disadvantage students, tertiary education, information experiment

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1 Introduction

Investment in education is widely regarded as a key contributor to economic growth. In the current education system, primary and secondary education are compulsory and accessible in most countries, while tertiary education is optional and increasingly expensive. In fact, tuition fees have more than doubled since the 1980s, as the vast majority of countries have moved toward a model in which students and their families bear a greater share of the cost of education, (OECD, 2021).¹ As a result, although a tertiary degree is now a necessary (though not sufficient) condition for stable employment, the proportion of the population with a tertiary degree is still low. In some countries, it has declined in the last decade, e.g. NCES (2022).

In this context, supporting disadvantaged students with financial aid has become much more prominent in broadening access to tertiary education, thus reducing their need for excessive part-time work and disproportionate reliance on family support. Government programs that allocate resources based on a combination of need and merit criteria provide a rationale for government intervention, primarily through the grant system. The purpose of this strategy is to ensure that talented and able young people can realize their potential from an equity perspective.

Targeted increases in funding for college access help narrow the gap between poor and non-poor students, but they are only part of the story. Students from low-income families often start their college careers behind their peers from more affluent families, and not just because of money. They tend to lack the information, advice and guidance they need to navigate the university process. Most disadvantaged families may underestimate the returns and overestimate the costs of tertiary education, influencing students' aspirations for higher education, as shown in Lergetporer et al. (2021). Lack of knowledge about parameters such as the employment rate of graduates or the role of public grants in educational performance leads many disadvantaged students to make suboptimal choices in their decision whether or not to enrol at the universities.

Evidence suggests that informing about the returns can increase the aspirations of specific groups of students, see Bettinger et al. (2012) and Hoxby and Turner (2015) with some policy relevance implications. Thus, providing specific information at critical stages can help students in modeling beliefs on future events and potentially make better choices. Useful information should consider what the literature suggests to elicit people's beliefs, Belfield et al.

¹This is possible either through direct tuition fees or through loan mechanisms that allow students to pay after graduation.

(2020) on the role of education and public grants.

Our paper studies the extent to which differences in the knowledge of information among students may contribute to gaps in educational aspirations among poor students. To this end, we have conducted a field experiment in Italy focusing on students from low-income families who benefit from need-based financial aid assistance and are enrolled in one of the Universities of the Emilia-Romagna region. The experiment explores what type of information is more effective in shifting aid recipients' preferences and expectations. The information treatment consists of two messages: the first one stresses the importance of obtaining and keeping the financial aid grant – while complying with the academic requirements imposed by the law, and the second one focuses on the importance of graduating on time for the expected labor market outcomes. The treatment is administered in the two groups before the students state their beliefs and aspirations about their future careers. In contrast, in the control group, we measure these expectations without providing any information on the role of financial aid or the labor market premium for college completion.²

The *preliminary* results show that the message on the importance of keeping financial aid has a much larger effect on future aspirations than the other message. In particular, it increases the aspiration of getting a job with good career prospects, and it reduces the intention of searching for part-time positions. In addition, both messages increase students' expectations of finding a job satisfying their ambitions within one year from graduation and of being in a highly skilled profession by the age of forty. Our analysis (still in progress) is looking at the impact that both messages can have when differences in social background like job or education, wealth, job status of both parents emerge across students.

Our analysis may have some target implications as we could inform the policy-maker on which messages can be much more effective while inducing the right incentive underlining the most important differences that influence the disadvantaged students.

The remainder of this paper is as follows: Section 2 encompasses the relevant literature in the field, while Section 3 provides background information and describes the field experiment in detail. Section 4 introduces the empirical strategy. Section 5 presents our empirical results. Concluding remarks are in section 6.

²Notice that our population is already enrolled in college, and the information available to them differs from the information they had at the end of high school.

2 Related Literature

This section is helpful first to understand how our contribution is placed in the literature and, second, the pros and cons that our approach may provide compared to the previous papers.

The economic literature has long studied the effect of learning gaps by socioeconomic status [Lavecchia et al. \(2020\)](#). Financial support (e.g., fee waiver) is crucial for low socio-economic (SES, hereafter) students, but it is not enough to bridge the widening educational gap between haves and have nots, [Bettinger et al. \(2017\)](#).³

In this view, economists have long been aware that the preferences, beliefs and constraints of individuals are partly shaped by such factors. As a consequence, unequal access to education has been shown to reduce students' outcomes with a downside effect on ambitions, aspirations and expectations of students, [Alesina et al. \(2022\)](#). While most of the research has increasingly focused on the effects of alleviating credit constraints through financial aid on students' access or graduation, [Castleman and Long \(2016\)](#) and [Bettinger et al. \(2019\)](#), our study contributes by focusing on the role that information provision may have on students' aspirations.

Lacking access to some information on education, students from underprivileged backgrounds use a very crude yardstick to understand the importance of having a college degree and more in general the costs and benefits of education, ([Oreopoulos and Dunn, 2013](#); [McGuigan et al., 2016](#)). This makes it harder to ascertain the true extent of the gap and, more importantly, more difficult to target resources to those who need them the most.

Indeed, misinformation or the lack of knowledge are important barriers that explain why individuals might not receive the right incentives to invest in education. [Wiswall and Zafar \(2015\)](#) find that college students are substantially misinformed about population earnings. Moreover, students lack important information about the available educational programs and their own eligibility [Peter and Zambre \(2017\)](#); [Peter et al. \(2021\)](#).

We partially differentiate from this kind of randomized-control trial process as we concentrate on the importance that releasing different information may have on disadvantaged students. Varying the information set available to students allows to capture the causal impact that these information treatment may have on students' aspirations on future outcomes.

The possibilities of the information experiments to answer policy-relevant questions have made them extremely important in economics over the last few years. While manipulating the

³These educational gap has even been exacerbated after the Covid-19 pandemic event. For instance, [Cacault et al. \(2021\)](#) shows through a randomized experiment that attending lectures via live streaming lowers outcomes in particular for low-ability students in tertiary education.

return to education is simply not possible, the possibility to provide different information on the role of education and financial aid may generate exogenous variations in their ambitions. Our paper joins this literature and aims at understanding better what extent students internalize market returns to education and how it influences their general aspirations on prospective salaries, part-time or expected job satisfaction.

Compared to the previous contributions, we further focus on the possibility that providing different information treatments may have on students' beliefs. Heterogeneous analysis (still in progress) seems to provide interesting analysis on the effect that information may have on differences in social background. In the next sections, we can give a clear idea of the setting we study at and our preliminary results.

3 The field experiment

Setting ER.GO. is the Regional Authority in Emilia-Romagna for the *Right to Higher Education* and it works very closely with the five Universities (Bologna, Ferrara, Modena and Reggio Emilia, Parma and Piacenza) to ensure financial aid-assistance to low-disadvantaged students. The public system through ER.GO. provides University students with a variety of services, including financial assistance, residential accommodations, dining facilities, counseling and support, job and careers guidance.

The eligibility for the grant is based on a series of strict cutoff, i.e., 23,000 euros, in family income (the only criteria for the first year enrollment), while family income is combined with yearly credits for the students instead enrolled in the other years. Our population involve all students (22,000) in the region Emilia-Romagna who benefit from a financial aid assistance by ERGO.

Design On February 2022, we launch a survey experiments under ER.GO. approval running a questionnaires which provide students with quantitative information such as statistics based on Statistical Office and Almalaurea (see Appendix A.1). The survey was designed to be a brief, but sharply focused electronic survey that would provide essential information relating to family and social background, details on expectations, ambitions or information (questions of the survey are currently provided upon request).

As underlined in the introduction, we selected two messages in line with what the literature suggests on the incentive that low-disadvantaged student may have on prosecuting their study. The first message on *Scholarship* (*S*, henceforth) stresses the importance of maintaining

the public grants, therefore of keeping up with the academic requirements of the financial aid program. The second message on *Education* (E , henceforth) underlines the importance of graduating from college in terms of labor market outcomes. As explained in the introduction, it is not ex ante clear whether one of the two message should prevails and which would be the general impact on the beliefs of the students.

Implementation The core of our experiment is to investigate whether, and to what extent receiving a message on the relevance of education on labor outcomes or the importance of public grants on the university career affects their preferences and expectations on their future job career. We are also interested in the comparison of the two types of messages. To pursue this goal, we send a questionnaire to all students perceiving a public grant in Emilia-Romagna. Among those who compiled, at least in part, the questionnaire (7,806 students, about 34 percent of the entire population), we randomly distinguished three groups: those to whom the information on the importance of scholarships on the university career is administered (group S); those who received the information focused on the relevance of the university career for labor market outcomes (group E); those who do not receive any type of information (the control group). To improve the heterogeneity of the groups' observable characteristics, we stratified the randomization based on two variables: gender and whether the respondent has received an accommodation in student's residence.

4 Data and Empirical Strategy

Baseline We estimate the effect of the two treatments on a series of outcomes through the following regression model:

$$Y_{ijk} = \alpha_0 + \alpha_1 S_{ijk} + \alpha_2 E_{ijk} + \alpha_3 Female_{ij} + \alpha_4 House_{ik} + \epsilon_{ijk} \quad (1)$$

where Y denotes the outcome of interest for student i , of gender j , living or not in an accommodation provided by ER.GO., denoted by k . S and E are the two dummies of interest. The first one takes value one if the student i has received the information on the role of scholarship. Zero otherwise. E is equal to one if the message on the role of education has been assigned to the student. $Female$ and $House$ represent the minimal set of control indicating, respectively, gender and living in an accommodation provided by ER.GO. Finally, ϵ is the

robust error term. Other than the main equation, we also added a vector of covariates in the regression that includes citizens, number of credits, average mark, Isee, distance between student's residence and university, father's and mother's educational qualification and their latest job title, a dummy for students-workers, type of academic degree, province of residence, enrollment year, graduation year and course fixed effects.

Outcomes The dependent variables we explored concern: the students' preferences on the characteristics of the future job ("I would prefer a job that allows me a career even if I will have to take risks" and "I would prefer a part-time job", respectively "*career*" and "*part time*", henceforth), their expectations ("I think I will be able to find a job within a year of my graduation by choosing a job that meets my ambitions", which we labelled "*expectations*"), and a dummy measuring the students' ambitions which is equal to one when the student wants to be in a highly skilled job at the age of forty (henceforth, "*top skill*").⁴ The first three dependent variables are measured on a scale of one to ten and then are normalized between 0 and 1. Therefore, coefficients α_1 e α_2 measure the effect of the two treatments on several outcomes and separately quantify the mean difference between each treatment group and the control group.

Marginal effects In the second part of Section 5, we analyze the different effects of the treatments by interacting the variables of interest with a set of proxies of the parents' background and computing the relative marginal effects. In this way, we are able to understand whether the differences between categories of parents' background are statistically different each others, and to point out the effects of the treatments for each group of students. The estimating equation for the analysis of treatment heterogeneity is the following:

$$Y_{ijk} = \beta_0 + \beta_1 S_{ijk} \times H_{ijk} + \beta_2 E_{ijk} \times H_{ijk} + \beta_3 Female_{ij} + \beta_4 House_{ik} + \epsilon_{ijk} \quad (2)$$

where H is one of the variables indicating the parents' background, namely: ISEE, parents' education, and parents' occupation status. After performed each regression, we have calculated the marginal effects which allow us to point out the treatment effect of $S E$ in each subgroup of the population. Starting with the group of 7,806 respondents, we dropped those who had not concluded the questionnaire. Our final sample counts 6,386 observations. Table 1

⁴Following the Isco classification, we consider highly skilled managers and professionals. <https://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm>

shows some first sights of our variables of interest. First, we point out that *Top skill* reaches the highest score (0.90) and, as expected, *Part time* has the lowest one (0.32) among the dependent variables. Distinguishing between the treatment and the control groups (columns "Control", "E", and "S"), we can note that the average values are similar to each other but the control group always shows the lowest ones with the except for *Part time*. In the second part of the table, we can see that, despite the randomization has been performed before the sample reduction, the number of components is the same in the three sub-samples. In the lower part of the table we show the statistics of the variables through which we conduct the analysis of heterogeneity. We consider the logarithm of ISEE as a proxy of the parents' income. The average (9.02) is almost equally divided among the sub-group. As to regards the parents' education, we divided the sample in three groups: one fourth of students have parents with no more than lower secondary education, 53 percent of students have at least a parent with no more than upper secondary education, and the rest of the sample is composed of students with at least a graduated parent. The percentages are almost constant among the three groups. The group *E* seems that with the lower education level as the percentage of parents with no more than the lower secondary education is the highest (26 percent). Finally, we considered the parents' occupation status. 62 percent of students have both parents who work *Parentswork* and the others have at least a parent not working at the time of the survey *Parents not work*. The percentage of *Parentswork* is slightly lower for those in group *S* (60 percent) and is higher in the control group and in the group *E* (64 and 63 percent).

Table 1: Descriptive statistics

| Variable | Overall | | | Control | | | E | | | S | | |
|----------------------------------|---------|------|-----------|---------|------|-----------|-------|------|-----------|-------|------|-----------|
| | Obs. | Mean | Std. dev. | Obs. | Mean | Std. dev. | Obs. | Mean | Std. dev. | Obs. | Mean | Std. dev. |
| Career | 6,270 | 0.66 | 0.26 | 2,095 | 0.65 | 0.26 | 2,083 | 0.66 | 0.26 | 2,092 | 0.67 | 0.25 |
| Part time | 6,033 | 0.32 | 0.30 | 2,018 | 0.33 | 0.30 | 2,008 | 0.33 | 0.30 | 2,007 | 0.31 | 0.29 |
| Expectations | 6,105 | 0.69 | 0.28 | 2,044 | 0.68 | 0.28 | 2,036 | 0.70 | 0.27 | 2,025 | 0.70 | 0.27 |
| Top skill | 6,252 | 0.90 | 0.30 | 2,082 | 0.89 | 0.32 | 2,080 | 0.91 | 0.29 | 2,090 | 0.91 | 0.28 |
| <i>Treatment groups</i> | | | | | | | | | | | | |
| Control | 6,386 | 0.33 | 0.47 | | | | | | | | | |
| E | 6,386 | 0.33 | 0.47 | | | | | | | | | |
| S | 6,386 | 0.33 | 0.47 | | | | | | | | | |
| Log ISEE | 6,386 | 9.02 | 1.46 | 2,129 | 9.01 | 1.51 | 2,128 | 9.01 | 1.48 | 2,129 | 9.03 | 1.38 |
| <i>Parents education</i> | | | | | | | | | | | | |
| Lower sec. education | 6,259 | 0.25 | 0.43 | 2,080 | 0.25 | 0.43 | 2,089 | 0.26 | 0.44 | 2,090 | 0.24 | 0.43 |
| Upper sec. education | 6,259 | 0.53 | 0.50 | 2,080 | 0.54 | 0.50 | 2,089 | 0.52 | 0.50 | 2,090 | 0.54 | 0.50 |
| Tertiary education | 6,259 | 0.22 | 0.41 | 2,080 | 0.22 | 0.41 | 2,089 | 0.21 | 0.41 | 2,090 | 0.22 | 0.42 |
| <i>Parents occupation status</i> | | | | | | | | | | | | |
| Parents work | 6,326 | 0.62 | 0.48 | 2,109 | 0.64 | 0.48 | 2,107 | 0.63 | 0.48 | 2,110 | 0.60 | 0.49 |
| Parents not work | 6,326 | 0.38 | 0.48 | 2,109 | 0.36 | 0.48 | 2,107 | 0.37 | 0.48 | 2,110 | 0.40 | 0.49 |

5 (Preliminary) Results

In this section, we first estimate the effect of the two informations on job preferences, ambitions and expectations. Next, we analyze the heterogeneity of their impact distinguishing by parents background.

5.1 Baseline

We estimate the effects of treatments on student outcomes through the formal model specified above. Results are shown in Table 2. As we can see in columns (1), (2), (3), and (4), the treatment S has a positive effect on the future job preferences: those who received the information on scholarship are more likely to prefer a job with career opportunities and less likely to prefer a part-time job. In addition, both treatments positively affect job expectations (columns 5 and 6) and are more inclined to prefer a highly qualified job (columns 7 and 8). The Wald test has been performed to compare the coefficients of the two treatments in columns "expectations" and "top skill" and we did not find any statistically significant difference.

Table 2: The effect of the treatments

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|---------------------|
| | career | career | part time | part time | expectations | expectations | top skill | top skill |
| Education | 0.007 (0.008) | 0.013 (0.008) | -0.005 (0.009) | -0.012 (0.010) | 0.017** (0.009) | 0.020** (0.009) | 0.021** (0.009) | 0.023** (0.010) |
| Scholarship | 0.019** (0.008) | 0.021** (0.008) | -0.016* (0.009) | -0.023** (0.010) | 0.017** (0.009) | 0.018** (0.009) | 0.025*** (0.009) | 0.028*** (0.010) |
| Female - House | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other covariates | | ✓ | | ✓ | | ✓ | | ✓ |
| R-squared | 0.012 | 0.072 | 0.011 | 0.063 | 0.006 | 0.084 | 0.001 | 0.050 |
| Observations | 6,270 | 6,252 | 6,033 | 6,017 | 6,105 | 6,085 | 6,252 | 6,232 |

OLS estimates. The dependent variables "career", "part time", and "expectations" are normalized to be between 0 and 1. Other covariates includes: citizens, number of credits, average mark, Isee, distance between student's residence and university, father's and mother's educational qualification and latest job title, students-workers, type of academic degree, and province of residence, graduation year, enrollment year and course fixed effects. Standard errors are robust: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2 Heterogeneity

We further explore the effects of the two treatments by analyzing the heterogeneous effects of the social background. We consider three proxies of the parents' background. For each analysis, we first show the heterogeneity of the treatments by interacting the variables of interest with, alternatively, ISEE (in logarithm), parents' education, and having parents with a job. This allow us to point out the effects of the two treatments compared to a reference category.

After that, we calculate the contrast marginal effects to appreciate the heterogeneity of the effect of the treatments. In Table 3, we interact the treatment dummies with ISEE, expressed in logarithm, which is a continuous variable labelled *log ISEE*. All the significant coefficients shown in the baseline analysis disappeared. This is a non-intuitive result that can be due the imposition of the linear effect of *log ISEE*. For this reason, we calculated the marginal effects at each decile of *log ISEE*. In Figure 1, the graph "career" shows that the treatment *E* is not significant in any decile of the population, while the treatment *S* is significant and positive in the poorest six deciles. Specularly, the treatment *S* is negative and significant in the graph "part time" but only for the wealthiest three deciles of the population. Regarding the variable "preferences", we can note that the treatments have a similar trend, but only the treatment *S* is significant at 5 percent of significance by the fourth to the sixth decile. Finally, it is important to note the results displayed in the graph "top skill", where we can point out that both the two treatments have a positive effect on the richest part of the *log ISEE* distribution but treatment *E* is not significant for the poorest part of the population.

Table 3: Heterogeneity of the treatments effects - ISEE

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | career | career | part_time | part_time | expectations | expectations | top_skill | top_skill |
| Education | -0.027 (0.048) | 0.023 (0.052) | -0.056 (0.063) | -0.078 (0.069) | 0.042 (0.052) | 0.062 (0.057) | -0.019 (0.058) | 0.004 (0.060) |
| Scholarship | 0.016 (0.054) | 0.027 (0.058) | -0.009 (0.064) | -0.030 (0.071) | -0.002 (0.057) | 0.026 (0.061) | -0.004 (0.065) | -0.031 (0.069) |
| <i>E</i> × ISEE | 0.004 (0.005) | -0.001 (0.006) | 0.006 (0.007) | 0.007 (0.008) | -0.003 (0.006) | -0.005 (0.006) | 0.004 (0.006) | 0.002 (0.007) |
| <i>S</i> × ISEE | 0.000 (0.006) | -0.001 (0.006) | -0.001 (0.007) | 0.001 (0.008) | 0.002 (0.006) | -0.001 (0.007) | 0.003 (0.007) | 0.006 (0.008) |
| Female - House | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other covariates | | ✓ | | ✓ | | ✓ | | ✓ |
| R-squared | 0.014 | 0.071 | 0.012 | 0.063 | 0.006 | 0.083 | 0.000 | 0.050 |
| Observations | 6,270 | 6,252 | 6,033 | 6,017 | 6,105 | 6,085 | 6,252 | 6,232 |

OLS estimates. The dependent variables "career", "part time", and "expectations" are normalized to be between 0 and 1. Other covariates includes: citizens, number of credits, average mark, Isee, distance between student's residence and university, father's and mother's educational qualification and latest job title, students-workers, type of academic degree, and province of residence, graduation year, enrollment year and course fixed effects. Standard errors are robust. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4 shows the heterogeneity on the basis of the parents' education level. Results deriving from OLS show a uniform effect of *S* on "career" as the coefficients of the interactions are not significant (columns 1 and 2). As for the analysis on part-time (columns 3 and 4), the treatment *S* presents coefficients no more significant, while it seems to have a negative effect for students with graduated parents compared to students with parents with lower secondary education. While the effect of *E* on the students' expectations is unsure as it is significant at 10

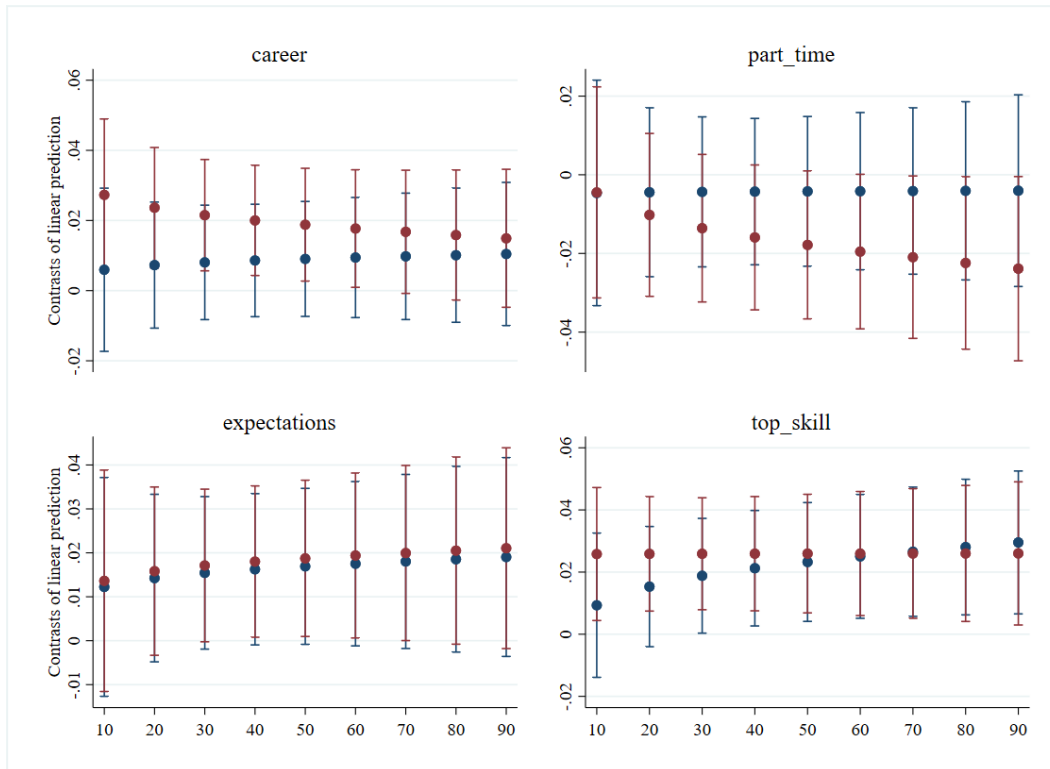


Figure 1: Treatments effect along the distribution of ISEE

Marginal effects of the baseline specification. The dependent variables "career", "part time", and "expectations" are normalized to be between 0 and 1. Capped vertical lines represent 95 percent confidence intervals based on robust standard errors.

percent only in the base analysis (columns 5 and 6), we can note a positive and overall significant effect of S , which is lower for students with parents' with an upper secondary education than our baseline level, namely students with parents' with lower secondary education. Finally, the effects of both E and S are overall significant on the likelihood of wanting to reach a qualified profession (columns 7 and 8). In this case, the heterogeneity among parents' education level seems not to exist as the coefficients of both the treatments are significant only at 10 percent for the tertiary education level and are not confirmed by the full regression. Results of marginal effects allow us to appreciate the effects of the treatments at each level of parents' education. First of all, we point out that S is positive and significant only for students with lower educated parents as to regards the effects on "career" and "ambitions", while is negative and significant only for students with upper educated parents for the effect on "part time". Both the treatments show a positive effect on "top skill" for all the students except those with graduate parents.

In Table 5, we studied the differences in the treatments distinguishing between students with both working parents ("Parents work") and students with almost a parent who does

Table 4: Heterogeneity of the treatments effects - Parents education

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------------------|--------------------|-------------------|---------------------|----------------------|---------------------|---------------------|--------------------|--------------------|
| | career | career | part_time | part_time | expectations | expectations | top_skill | top_skill |
| E | 0.027 (0.017) | 0.020 (0.017) | 0.010 (0.019) | 0.004 (0.020) | 0.030* (0.018) | 0.026 (0.019) | 0.037** (0.019) | 0.037* (0.020) |
| S | 0.036** (0.017) | 0.034* (0.017) | 0.017 (0.019) | 0.009 (0.020) | 0.045*** (0.017) | 0.047*** (0.018) | 0.045** (0.019) | 0.048** (0.019) |
| E × Up. Sec. education | -0.028 (0.020) | -0.008 (0.021) | -0.015 (0.023) | -0.018 (0.024) | -0.020 (0.021) | -0.012 (0.022) | -0.012 (0.023) | -0.008 (0.024) |
| E × Tert. education | -0.018 (0.024) | -0.009 (0.025) | -0.036 (0.028) | -0.032 (0.030) | -0.016 (0.026) | -0.007 (0.027) | -0.052* (0.027) | -0.046 (0.028) |
| S × Up. Sec. education | -0.027 (0.020) | -0.025 (0.021) | -0.032 (0.023) | -0.027 (0.024) | -0.039* (0.021) | -0.040* (0.022) | -0.015 (0.023) | -0.018 (0.023) |
| S × Tert. education | -0.009 (0.024) | -0.006 (0.025) | -0.072** (0.028) | -0.081*** (0.030) | -0.036 (0.026) | -0.042 (0.027) | -0.049* (0.027) | -0.044 (0.028) |
| Female - House | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other covariates | | ✓ | | ✓ | | ✓ | | ✓ |
| R-squared | 0.012 | 0.073 | 0.012 | 0.064 | 0.005 | 0.084 | 0.001 | 0.050 |
| Observations | 6,147 | 6,129 | 5,918 | 5,902 | 5,990 | 5,970 | 6,126 | 6,106 |
| Education - Low. Sec. education | 0.027 | 0.020 | 0.010 | 0.004 | 0.030* | 0.026 | 0.037** | 0.037* |
| Education - Up. Sec. education | -0.000 | 0.011 | -0.005 | -0.014 | 0.010 | 0.014 | 0.025* | 0.029** |
| Education - Tert. education | 0.009 | 0.010 | -0.027 | -0.028 | 0.014 | 0.019 | -0.015 | -0.009 |
| Scholarship - Low. Sec. education | 0.036** | 0.034* | 0.017 | 0.009 | 0.045*** | 0.047*** | 0.045** | 0.048** |
| Scholarship - Up. Sec. education | 0.008 | 0.009 | -0.015 | -0.018 | 0.006 | 0.007 | 0.030** | 0.030** |
| Scholarship - Tert. education | 0.027 | 0.028 | -0.055*** | -0.072*** | 0.009 | 0.005 | -0.004 | 0.004 |

OLS estimates. The dependent variables "career", "part time", and "expectations" are normalized to be between 0 and 1. Other covariates includes: citizens, number of credits, average mark, Isee, distance between student's residence and university, father's and mother's educational qualification and latest job title, students-workers, type of academic degree, and province of residence, graduation year, enrollment year and course fixed effects. Standard errors are robust. Coefficients in the bottom part are estimates of marginal effects. Standard errors of marginal effects are available upon request. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

not work ("Parents not work"). Considering the interaction terms in columns (1) and (2), the treatment S on "career" seems less effective for the category "Parents not work". The analysis of the marginal effects shows that S has no effects on this latter category. In addition, the full regression and the relative margins show a positive effect of E on "career", which is not significant for the category "Parents not work". As in the above-seen tables, S is confirmed to have a non-robust effect on the variable "part-time" (columns 3 and 4). Ols estimates point out that the effect of E on "expectations" is not significantly different between the two categories (columns 5 and 6), but the marginal effects show no significant coefficients for "Parents not work". Therefore, E seems significant only for the category "Parents work" to improve the student's ambitions. Finally, both the treatments seem to have a positive and non-heterogeneous effect on "top skill" (columns 7 and 8). For its part, the analysis on the marginal effects finds a positive and significant effect of E only for the category "Parents work". The effect of S is positive for both categories.

Table 5: Heterogeneity of the treatments effects - Parents' occupation status

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------|----------------------|----------------------|-------------------|---------------------|--------------------|---------------------|---------------------|----------------------|
| | career | career | part_time | part_time | expectations | expectations | top_skill | top_skill |
| E | 0.017 (0.010) | 0.021** (0.010) | 0.000 (0.012) | -0.011 (0.012) | 0.020* (0.011) | 0.023** (0.011) | 0.028** (0.012) | 0.033*** (0.012) |
| S | 0.030*** (0.010) | 0.033*** (0.010) | -0.017 (0.012) | -0.023* (0.013) | 0.012 (0.011) | 0.010 (0.012) | 0.021* (0.012) | 0.025** (0.012) |
| E × Parents not work. | -0.027 (0.017) | -0.025 (0.017) | -0.017 (0.020) | -0.005 (0.020) | -0.010 (0.018) | -0.010 (0.018) | -0.016 (0.020) | -0.025 (0.020) |
| S × Parents not work. | -0.031* (0.016) | -0.036** (0.017) | 0.000 (0.019) | -0.000 (0.020) | 0.009 (0.018) | 0.016 (0.018) | 0.012 (0.019) | 0.009 (0.020) |
| Female - House | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other covariates | | ✓ | | ✓ | | ✓ | | ✓ |
| R-squared | 0.012 | 0.076 | 0.011 | 0.062 | 0.007 | 0.086 | 0.001 | 0.050 |
| Observations | 6,211 | 6,193 | 5,976 | 5,960 | 6,048 | 6,028 | 6,192 | 6,172 |
| E - Parents work | 0.017 (0.010) | 0.021 ** (0.010) | 0.000 (0.012) | -0.011 (0.012) | 0.020 * (0.011) | 0.023 ** (0.011) | 0.028 ** (0.012) | 0.033 *** (0.012) |
| E - Parents not work | 0.030 (0.010) | 0.033 (0.010) | -0.017 (0.012) | -0.023 (0.013) | 0.012 (0.011) | 0.010 (0.012) | 0.021 (0.012) | 0.025 (0.012) |
| S - Parents work | 0.030 *** (0.010) | 0.033 *** (0.010) | -0.017 (0.012) | -0.023 * (0.013) | 0.012 (0.011) | 0.010 (0.012) | 0.021 * (0.012) | 0.025 ** (0.012) |
| S - Parents not work | -0.001 (0.013) | -0.003 (0.014) | -0.016 (0.015) | -0.024 (0.016) | 0.021 (0.014) | 0.027 * (0.014) | 0.033 ** (0.015) | 0.034 ** (0.016) |

OLS estimates. The dependent variables "career", "part time", and "expectations" are normalized to be between 0 and 1. Other covariates includes: citizens, number of credits, average mark, Isee, distance between student's residence and university, father's and mother's educational qualification and latest job title, students-workers, type of academic degree, and province of residence, graduation year, enrollment year and course fixed effects. Standard errors are robust. Coefficients in the bottom part are estimates of marginal effects. Standard errors of marginal effects are available upon request. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 Concluding remarks

We have conducted a randomized control experiment with university students in Emilia-Romagna who benefit from the financial aid program offered by the regional public system. Looking at two types of messages stressing the importance of receiving public grants or the role of education in terms of career success, we have shown that the importance of maintaining the public grants has, on average, a more significant impact on career and part-time preferences than the one related to the alternative message. Therefore, correct information on the relevance of public grants pushes the students to be more ambitious regarding job preferences. This effect is heterogeneous considering the parents' background and it seems stronger for the poorest students and those whose parents work and are less educated. As for the short-run expectations, through both the treatments, students are more confident of finding an ambitious job within a year from graduation. The mechanisms of the two treatments are different: receiving the message on the importance of maintaining the public grants is effective for students with the poorest education background, while that on the importance of graduating for labor market outcomes seems to work for students whose both parents work.

Finally, both treatments increase almost all students' ambitions, except those with graduated parents, to reach a qualified job at the age of forty. In addition, the treatment E does not affect the poorest students and those whose parents work. We consider our results an important starting point to reduce pre-existing inequalities among university students as guys from disadvantaged backgrounds do not give the same value to education as their peers do. Filling the information gap, and in particular, making disadvantaged students aware of the relevance of the grants, can lead to a more equal and more efficient university system.

References

- Alesina, A., Carlana, M., La Ferrara, E., Pinotti, P., 2022. Revealing stereotypes: Evidence from immigrants in school. NBER WP 25333 .
- Belfield, C., Boneva, T., Rauh, C., Shaw, J., 2020. What drives enrolment gaps in further education? the role of beliefs in sequential schooling decisions. *Economica* 87, 490–529.
- Bettinger, E., Fox, L., Loeb, S., Taylor, E.S., 2017. Virtual classrooms: How online college courses affect student success. *American Economic Review* 107, 2855–75.
- Bettinger, E., Gurantz, O., Kawano, L., Sacerdote, B., Stevens, M., 2019. The long-run impacts of financial aid: Evidence from california’s cal grant. *American Economic Journal: Economic Policy* 11, 64–94.
- Bettinger, E., Long, B.T., Oreopoulos, P., Sanbonmatsu, L., 2012. The role of application assistance and information in college decisions: Results from the h&r block fafsa experiment. *The Quarterly Journal of Economics* 127, 1205–1242.
- Cacault, M.P., Hildebrand, C., Laurent-Lucchetti, J., Pellizzari, M., 2021. Distance Learning in Higher Education: Evidence from a Randomized Experiment. *Journal of the European Economic Association* 19, 2322–2372.
- Castleman, B.L., Long, B.T., 2016. Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation. *Journal of Labor Economics* 34, 1023–1073.
- Hoxby, C.M., Turner, S., 2015. What high-achieving low-income students know about college. *American Economic Review* 105, 514–17.
- Lavecchia, A.M., Oreopoulos, P., Brown, R.S., 2020. Long-run effects from comprehensive student support: Evidence from pathways to education. *American Economic Review: Insights* 2, 209–24.
- Lergetporer, P., Werner, K., Woessmann, L., 2021. Does ignorance of economic returns and costs explain the educational aspiration gap? representative evidence from adults and adolescents. *Economica* 88, 624–670.

- McGuigan, M., McNally, S., Wyness, G., 2016. Student awareness of costs and benefits of educational decisions: Effects of an information campaign. *Journal of Human Capital* 10, 482–519.
- NCES, 2022. Undergraduate enrollment. condition of education. U.S. Department of Education, Institute of Education Sciences .
- OECD, 2021. Education at a glance 2021: Oecd indicators. OECD Publishing .
- Oreopoulos, P., Dunn, R., 2013. Information and college access: Evidence from a randomized field experiment. *The Scandinavian Journal of Economics* 115, 3–26.
- Peter, F., Spiess, C.K., Zambre, V., 2021. Informing students about college: Increasing enrollment using a behavioral intervention? *Journal of Economic Behavior & Organization* 190, 524–549.
- Peter, F.H., Zambre, V., 2017. Intended college enrollment and educational inequality: Do students lack information? *Economics of Education Review* 60, 125–141.
- Wiswall, M., Zafar, B., 2015. How do college students respond to public information about earnings? *Journal of Human Capital* 9, 117–169.

A Appendix

A.1 Treatment messages *S* and *E*

A.1.1 Message *S* on the role of *Scholarship*

Original Numerosi studi mostrano che rispettare i tempi previsti dagli ordinamenti per la conclusione del percorso universitario risulta determinante nel favorire migliori opportunità occupazionali.

Confrontando le performance dei laureati in Emilia-Romagna, il report di Almalaurea & ER.GO. (2017) mostra che gli studenti che ottengono e mantengono la borsa di diritto allo studio per tutta la durata del corso di laurea hanno un'età alla laurea inferiore rispetto ai non borsisti (22,9 anni contro 24,4 anni dei non borsisti) e sono più regolari nel conseguimento del titolo: i borsisti che conseguono il titolo in corso sono oltre il 96%, i non borsisti sono il 57,5%.

Inoltre, gli studenti che mantengono la borsa di studio fino alla laurea hanno una soddisfazione più elevata circa l'esperienza universitaria compiuta. Apprezzano infatti maggiormente il corso di laurea, i rapporti con i docenti, le aule e le biblioteche.

Infine, il rapporto Almalaurea (2020) afferma che il punteggio negli esami esercita un effetto positivo sulle possibilità occupazionali: la probabilità di essere occupato a un anno dal titolo aumenta del 14,6% per chi raggiunge punteggi superiori alla mediana degli studenti.

Per ulteriori approfondimenti:

https://www.almalaurea.it/universita/altro/2017/diritto_studio

<https://www.almalaurea.it/rapportoalmalaurea2021.pdf>

Translation Numerous studies show that complying with the timeframes set by the regulations for completing a university degree is decisive in fostering better employment opportunities.

Comparing the performance of graduates in Emilia-Romagna, the report by Almalaurea & ER.GO (2017) shows that students who obtain and maintain the right-to-study grant for the entire duration of their degree have a lower age at graduation than non-scholarship holders (22.9 years vs. 24.4 years of non-scholarship holders) and are more regular in their degree attainment: scholars who obtain their degree in progress are more than 96%, non-scholarship holders are 57.5%.

In addition, students who maintain their scholarship until graduation have higher satisfaction about their completed college experience. In fact, they appreciate the degree program,

relationships with faculty, classrooms and libraries more.

Finally, the Almalaurea report (2020) states that scores on exams exert a positive effect on employment chances: the probability of being employed one year after graduation increases by 14.6% for those who achieve scores above the student median.

For further discussion:

https://www.almalaurea.it/universita/altro/2017/diritto_studi

<https://www.almalaurea.it/rapportoalmalaurea2021.pdf>

A.1.2 Message *E* on the role of *Education*

Original Numerosi studi mostrano che rispettare i tempi previsti dagli ordinamenti per la conclusione del percorso universitario risulta determinante nel favorire migliori opportunità occupazionali.

Confrontando l'attuale condizione occupazionale dei giovani in Italia, Almalaurea (2020) segnala che chi completa gli studi in corso ha, a parità di altre condizioni, una probabilità maggiore di trovare lavoro già ad un anno dalla laurea rispetto a coloro che completano gli studi con un anno di ritardo (+11,6%) e, ancor di più, rispetto a coloro che si laureano con due o più anni in ritardo (+21,8%).

Inoltre, diversi studi mostrano che laurearsi con oltre tre anni di ritardo raddoppia il rischio medio di svolgere un lavoro che non richiede la laurea e comporta una retribuzione salariale di circa il 17% inferiore a quella di chi ha completato il corso nei tempi previsti.

Infine il rapporto Almalaurea (2020) afferma che il punteggio negli esami esercita un effetto positivo sulle possibilità occupazionali: la probabilità di essere occupato a un anno dal titolo aumenta del 14,6% per chi raggiunge punteggi superiori alla mediana degli studenti.

Per ulteriori approfondimenti:

<https://www.almalaurea.it/universita/occupazione/occupazione19>

<https://www.lavoce.info/archives/27765/il-rischio-di-laurearsi-in-ritardo/>

https://www.almalaurea.it/04_sintesi_rapportoalmalaurea2021.pdf

Translation Looking at the current employment status of young people in Italy, Almalaurea (2020) reports that those who complete their studies on time are, all other things being equal, more likely to find a job one year after graduation than those who complete their studies one year late (+11.6%) and, even more so, than those who graduate two or more years late (+21.8%).

In addition, several studies show that graduating more than three years late doubles the average risk of working in a job that does not require a degree and results in about 17% lower wages than those who completed the course on time.

Finally, the Almalaurea report (2020) states that scoring on exams positively affects employment chances: the probability of being employed one year after graduation increases by 14.6% for those who achieve scores above the student median.

For further discussion:

<https://www.almalaurea.it/universita/occupazione/occupazione19>

<https://www.lavoce.info/archives/27765/il-rischio-di-laurearsi-in-ritardo/>

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