

The effect of parental background on tertiary education graduates in Spain^a

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Abstract

In this paper we study whether parental background has any effect on the type of program of tertiary education graduates in Spain. While some theories predict that parental influence in education decisions dissipate at high education levels, other theories advocate the importance of parental background in higher education choices. We analyze program type in terms of length of the program and its academic prestige. We find that parental background affects the length of the university program from which individuals graduate. Moreover, results reveal significant gender differences in the role of parental background in choosing an academically prestigious program. By focusing on a sample of graduates, the effect of parental background on the probability of entering university or dropout behavior is not included in our analysis.

Introduction

The literature on intergenerational mobility has for long recognized the importance of education as the key intermediate factor (Breen and Jonsson 2005; Erikson and Goldthorpe 2002; Kerckhoff 1995; Kerckhoff 2001). Moreover, the strength with which parental background affects educational attainment of individuals tells us about the equality of opportunity of a country. Empirical research has mostly found that parental background influences tend to fade with the level of education (Breen et al. 2010; Jackson et al. 2005; Raftery and Hout 1993). There are, however, studies that report some level of persistent inequality in education (Shavit and Blossfeld 1993). Several hypotheses explain the waning family background phenomenon. The social selection itself, that exists during the whole education path, implies a smaller role for parental background at the higher levels of education (Mare 1981). Additionally, the Life Course Perspective argues that students at later transitions are less dependent on their parents in financial and cultural terms (Muller and Karle 1993), and therefore, parents exert smaller influence on their decisions. The hypothesis named Maximally Maintained Inequality claims, instead, that parental effects lose strength in educational mobility equations because education is highly subsidized by governments and enrollment rises so fast that lower social classes are progressively included into levels of education previously closed for them (Raftery and Hout 1993).

Nonetheless, special attention has to be paid not only to the effect of social origin on the probability to attain certain levels of education, but also its effect on the type of the education programs within a given level. There are two main explanations for the effect of parental background on the choice of type of study program. On the one hand, it may be rational for lower social classes to choose shorter or less risky programs, to maximize the probability of graduating (Breen and Goldthorpe 1997). On the other hand, when access to higher levels of education becomes universal or nearly so, higher social classes may choose better quality programs to maintain their social advantage across generations (Effectively Maintained Inequality hypothesis (Lucas 2009; Lucas 2001)).

In this paper, we analyze the influence of parental background on the type of study program within a sample of tertiary level graduates from the year 2000 in Spain. Notice that all individuals in our sample successfully attained the tertiary level education. Therefore, the effects of parental background on enrollment into the tertiary education and dropout rates are not considered. Instead, we focus on studying if parental background has a role in explaining different program types within the sample of those who graduated. Unfortunately, we will not be able to distinguish whether this is the result of initially different choices of study program or different dropout rates per study program across social classes. Most likely both mechanisms are at work.

According to the theories that argue a dissipating role of parental background, we should expect a small or null effect of social origin on the type of study program. This is because we are analyzing tertiary education in a period where access to university was nearly universal in Spain (see next section). However, the theories that relate parental background to the choice of study program would predict a significant large effect of parental background.

We analyze two qualitative characteristics of the university studies: the length of the program and its academic prestige. We can distinguish between long and short programs in the Spanish universities during the 2000s. They differ in several qualitative aspects apart from the years of study they require. The long program, which is called *Licenciatura*, lasts 4-5 years and gives access to doctoral studies. Moreover, it is generally regarded as more prestigious by the labor market, which translates into on average more and better job opportunities than the short program, that consists of 3 years and it is called *Diplomatura* (Mora et al. 2000). The academic prestige of the study program is computed using empirical Bayes predictions from the self-reported measure of academic prestige. This way we obtain a much more reliable measure of the prestige of the study program net of small sample problems.

Other papers have studied the influence of parental background in the Spanish education system. Peraita and Sánchez (1998) analyze the educational attainment of children given their family background in 1985. Parental background is measured as social class, parental income, working family members and number of siblings. They find that those in a high social class and with high income have a higher probability to achieve higher education, especially for girls. Petrongolo and San Segundo (2002), while studying the effect of labor market conditions on the probability to keep studying at 16, find that parental education influences this choice. Albert (2000), Mora (1997) and Rahona-López (2009), instead, focus on the demand for university education in Spain. They all find that, despite the expansion of higher education, parental background heavily influences the demand for university education in Spain, especially when measured as parental education level. Woessman (2004) includes Spain in a comparative study on the effect of parental background on student performance using data on test scores of 13-year-old students. He finds similar parental background effects across countries. Triventi (2013) also includes Spain in his comparative study of the effect of parental background on higher education choices. He uses the same survey as in this paper and similar variables of interest. We contribute to the literature in that we define the dependent variables according to the Spanish context and we provide more detailed results of the Spanish case, considering male and female samples separately and identifying which individuals benefit the most from their parental background in Spain.

Research on the education performance of the immigrant population in Spain is also related to our paper. Cebolla-Boado and Garrido-Medina (2011), for instance, find that family background is the main explanation why students perform on average worse in schools with high concentration of immigrants. Similarly, Zinovyeva et al. (Forthcoming) find that the persistent achievement gap in education observed between natives and immigrants is mostly due to individual and family characteristics. Nonetheless, Recaño-Valverde and Roig-Vila (2003) find that immigrant status accounts for a lower likelihood to enter tertiary education even after controlling for socioeconomic characteristics.

The rest of the paper is organized as follows. The next section sketches the Spanish tertiary education system. Section 3 presents the data and analytical methods used for each of the two analyses: program length and academic prestige. Finally, the last two sections present and discuss the results, respectively.

2. Spanish tertiary education

During the major part of the twentieth century (until late sixties) the Spanish university education was largely restricted (although not formally) to a much selected elite as compared to the massive phenomenon known today. Participation rate in tertiary education in Spain grew seven times the size of that in the early sixties. In the year 2000, nearly 34% of individuals aged from 25 to 34 had tertiary education in Spain, much above the European Union average (23%).²

The key change that paved the path to the expansion of tertiary education in Spain was the introduction of the Act on University Reform (*Ley de Reforma Universitaria, LRU*) in 1983. It changed the university organization, giving it, above of all, the long-demanded autonomy in establishing new curricula. This was also the first law to abandon the old financing system assigned to full professor positions and shifted it towards the students enrollment numbers (EURYDICE 2009; Mora and Vidal 2000; Perotti 2007). Under the new system, universities could enroll much more students, create new curricula and introduce certain flexibility in the assessment rules. This opened a wide avenue for mass tertiary education for the first time in the history of Spain. This law was reinforced with the provisions of the Act on the General Organization of the Education System (*Ley Orgánica de Ordenación General del Sistema Educativo, LOGSE*) in 1990. The main contribution of this law to mass tertiary education was the establishment of higher vocational education as higher non-university tertiary education. The consecutive massive inflow of students into the tertiary system called for the need of establishing some quality rules in the tertiary sector. This was brought by the Act on Universities (*Ley Orgánica de Universidades, LOU*) in December 2001. Apart from a further strengthening of the university autonomy and the introduction of the National Agency for Quality Assessment and Accreditation (*ANECA*), LOU expanded also the influence of local autonomous governments on university financing. All these changes led to a rapid and massive expansion of the tertiary education in Spain (Vidal 2003). While in 1982 there were 31 universities in Spain (5 private and 26 public), in 2005 there were already 71 universities (from which 23 were private). Such increase shows best the magnitude of the tertiary level expansion in Spain since the 80s.

3. Data and Methods

To analyze the choice of tertiary level studies in Spain, we use the REFLEX data. This survey consists of information on individuals who graduated in 2000 and were interviewed five years later in 2005. We have detailed information on their graduate studies, their parental level of education and their personal background. All this information is available for 3522 individuals in Spain. The survey used stratified sampling and had a response rate of 22% in Spain (Allen and Van der Velden 2007). We restrict the sample to those individuals below 35 years old. Our working sample consists of 3292 individuals.

Parental background is described by the level of education of the father and the mother of the respondent. Each of these variables has four levels: without studies, primary education, secondary education and tertiary education. We also create a variable that collects the highest level of

² Source: Eurostat.

education attained by parents. Unfortunately, no other information on parental background is available in this survey.³

Our analysis entails two program characteristics. First, we estimate the effect of parental background on the probability to study a short vs. long program. As mentioned above, this distinction does not only refer to the number of years of study, but it has a qualitative aspect as well. Graduates from short programs have no access to doctoral studies and generally have more limited job opportunities than graduates from long programs, especially in Spain (Mora et al. 2000).

Second, we analyze the choice of an academically prestigious program. The respondent was asked to what extent the program was generally regarded as academically prestigious (in a Likert scale from 1 to 5 scale). Since the reported level of academic prestige of the program could be considered endogenous,⁴ we construct a measure based on empirical Bayes predictions. We take into account that the prestige of a program in Spain depends, basically, on three items: the length of the program as mentioned above, the field of study and the university where the program is taken.⁵ Therefore, we compute a measure of prestige for each program characterized by its length, its field of study (21 categories) and the university.⁶ This implies 402 types of programs (clusters). To do so we estimate a random-intercept model with an ordinal dependent variable (prestige with 3 categories) and then compute via empirical Bayes predictions the probability to study an academically prestigious program (prestige>2) for each cluster (Skrondal and Rabe-Hesketh 2012, p. 594-595, 602-605.). This variable should avoid the endogeneity problem of the self-reported measure of program prestige.

We perform a logistic estimation to analyze the program length since the dependent variable is binomial and a linear regression (OLS) to analyze prestige as computed above. We use three sets of variables for parental background: father's education level (model 1), maximum parental education level (model 2), and both father's and mother's education levels (model 3). Apart from parental education, we control for gender, age, track of secondary education (vocational vs.

³ There is information on whether parents are immigrants, but they represent below 1.5% of the sample. Therefore, we do not include this variable in our regressions, although we include these individuals in the analysis.

⁴ The reported level of prestige of the program could be affected by the labor market outcomes of the respondent, for instance, as it is a subjective measure. Then, if parental background also affects labor market outcomes, a spurious correlation between parental background and prestige of the program could arise.

⁵ There are large differences in the prestige across Spanish universities. Only a few of them are listed in the international rankings (ARWU Shanghai ranking, QS World University Rankings), for instance.

⁶ Triventi (2013) measures prestige of the field of study and university quality separately. He finds that the choice of university quality is positively affected by parental background. Yet, his results show that his measure of prestige of field of study (which is based on the average academic prestige of the program and the future occupational status of its graduates 5 years later) is not affected by parental background in Spain. We propose an alternative measure of program academic prestige that we consider to be more adequate for the Spanish context. We believe that the interaction between field of study, program length and university shape the level of academic prestige of a program in Spain.

academic) and average grade in secondary education.⁷ Moreover, since track of secondary education and average grade in secondary education might also be affected by parental background, we also run the estimations without these variables as in Triventi (2013). When they are not included parental education collects the gross effect of social origin, while when controlling for them we consider only the net effect of parental background on tertiary education choices. Finally, we compute predicted probabilities for different individuals to disentangle for whom social origins are more important.

Table 1 reports the descriptive statistics of the variables, distinguishing between long and short program. It shows that 60% of graduates studied a long program. Moreover, average prestige of long programs ('Licenciatura') is slightly higher than that of short programs ('Diplomatura'). We observe a better parental background for the 'Licenciatura' sample, suggesting that parental education will influence the choice between long and short program. Similarly, those who chose long program have on average higher grade in secondary education than those who studied a short program. As for gender, there are no significant differences across samples. Around 66% of graduates are female. The highest difference is in the track of secondary education. Those who followed a vocational track are more likely to study a short program. This is due to the tracking system itself that restricts the access of these students to some long programs.

Table 1. Descriptive statistics.

Variable	All		'Diplomados'		'Licenciados'		Range	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Min	Max
Long Program	0.60	0.49	0	0	1	0	1	1
Prestige	2.00	0.83	1.84	0.80	2.12	0.83	1	3
Father's education	2.66	0.96	2.47	0.90	2.79	0.98	1	4
Mother's education	2.47	0.88	2.30	0.82	2.58	0.90	1	4
Max parental education	2.81	0.94	2.62	0.91	2.95	0.93	1	4
Female	0.65	0.48	0.67	0.47	0.64	0.48	0	1
Age	29.31	1.92	28.76	2.08	29.68	1.71	26	34
Vocational track	0.08	0.27	0.15	0.36	0.03	0.17	0	1
Grade in secondary education	2.90	0.92	2.66	0.81	3.04	0.97	1	5
Observations	3292		1319		1973			

Parental education: 1-without studies, 2-primary education, 3-secondary education and 4-tertiary education.

Grade in secondary education: 1-pass ('suficiente'), 2- good ('bien'), 3- very good ('notable'), 4- excellent ('excelente') and 5- excellent with honors ('matrícula de honor').

⁷ Average grade in secondary education takes the following values: 1-pass ('suficiente'), 2- good ('bien'), 3- very good ('notable'), 4- excellent ('excelente') and 5- excellent with honors ('matrícula de honor').

4. Results

4.1 Long vs. short program

We first study whether parental background influences the choice between long and short university program. Table 2 reports the coefficients of the logistic estimation of the probability of studying a long program. As mentioned above, in model 1, we include only the father's education level as a measure of parental background. Model 2 includes instead the highest level of education among both parents, while model 3 includes both the education level of father and the one of mother. Apart from parental education, we control for gender and age to estimate the gross effect of parental background on choice of the university program by its length. Furthermore, we add the track of secondary education (vocational vs. academic) and average grade in secondary education to estimate the effect of parental education net of the previous education achievements.

Results show that higher parental education affects positively the likelihood to study a long program. Model 3 reveals that the best combination of parental education is having a father with tertiary education and a mother with at least secondary education. Although the coefficients measuring the gross effect of parental background are larger than the net effects, a significant role for parental background remains when controlling for previous educational outcomes. Therefore, we find evidence supporting the theories on the impact of parental background on the choice of type of tertiary education program.

We also find that students that followed the vocational track in secondary education are less likely to graduate from a long program, while those individuals with a higher grade in secondary education have larger chances of studying a long program. The effects of these two variables are large (see Figure 1 below).

Table 2. Coefficients of a logistic estimation. Dependent variable: Long program (1=long, 0=short).

	Model 1		Model 2		Model 3	
	Gross	Net	Gross	Net	Gross	Net
Female	0.115 (0.080)	0.113 (0.085)	0.105 (0.080)	0.103 (0.085)	0.105 (0.080)	0.104 (0.085)
Age	0.273*** (0.023)	0.361*** (0.025)	0.283*** (0.023)	0.367*** (0.025)	0.282*** (0.023)	0.367*** (0.025)
Vocational track		-2.123*** (0.187)		-2.104*** (0.187)		-2.094*** (0.186)
Grade in second. educ.		0.674*** (0.048)		0.669*** (0.048)		0.666*** (0.048)
Father's education=1	-0.146 (0.136)	-0.029 (0.144)			0.037 (0.165)	0.140 (0.172)
Father's education=3	0.304*** (0.095)	0.275*** (0.101)			0.145 (0.099)	0.140 (0.105)
Father's education=4	0.854*** (0.096)	0.692*** (0.100)			0.530*** (0.114)	0.442*** (0.120)
Max par. education=1			-0.247 (0.164)	-0.121 (0.176)		
Max par. education=3			0.483*** (0.093)	0.419*** (0.099)		
Max par. education=4			0.879*** (0.092)	0.700*** (0.097)		
Mother's education=1					-0.228 (0.160)	-0.217 (0.166)
Mother's education=3					0.492*** (0.102)	0.434*** (0.110)
Mother's education=4					0.537*** (0.127)	0.389*** (0.134)
Constant	-7.917*** (0.666)	-12.187*** (0.785)	-8.283*** (0.676)	-12.440*** (0.790)	-8.231*** (0.674)	-12.384*** (0.790)
Pseudo R-squared	0.064	0.150	0.068	0.152	0.072	0.155
MZ R-squared	0.111	0.259	0.117	0.262	0.125	0.267
Observations	3292	3292	3292	3292	3292	3292
AIC	4162.064	3783.886	4144.831	3774.778	4133.114	3768.268
BIC	4198.66	3832.68	4181.426	3823.572	4188.008	3835.36

* p<0.10, ** p<0.05, *** p<0.01, robust standard errors in parenthesis, McKelvey and Zavoina's R² reported.
Parental education: 1- no studies, 2- primary education, 3- secondary education, 4- tertiary education.

Figure 1. Predicted probabilities of studying a long program for a 30 year-old male (based on model 2) by parental education and grade and track in secondary education.

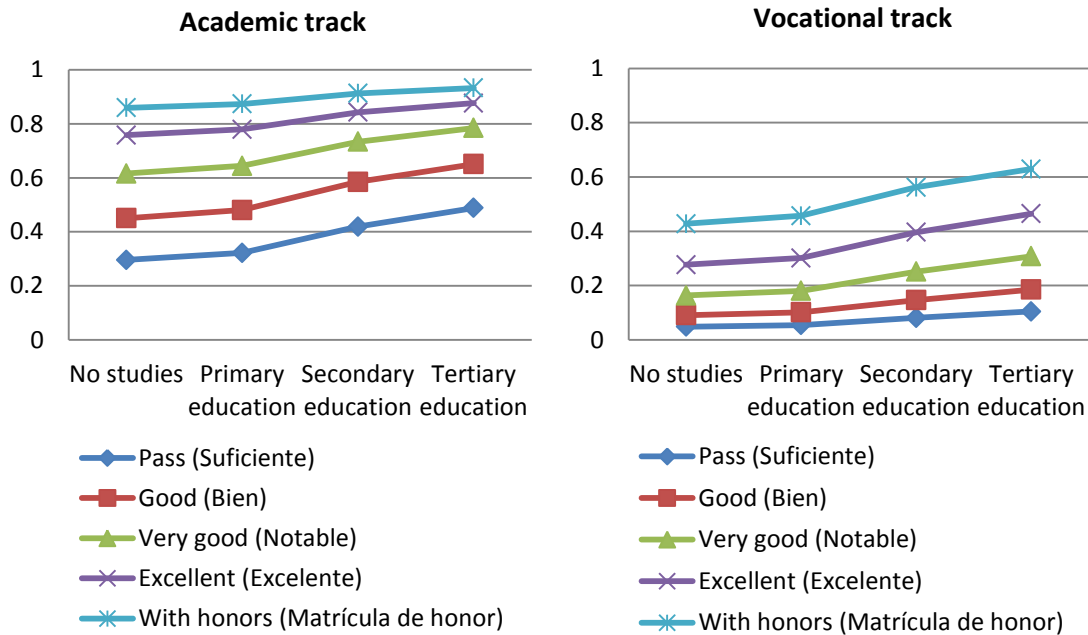


Figure 1 shows the predicted probability of a 30-year-old male by different track, grades and parental background (based on model 2). The same information with confidence intervals is available in Table A1 of the appendix.

There is a clear difference between those in the academic track (left figure) and those in the vocational track (right figure). While for most of those in the academic track their probability to graduate from a long program is above 50%, for those in the vocational track it is mostly below this threshold.

The probability to study a long program always increases with the education level of parents. The largest total effect of parental education background on the probability to graduate from a long program occurs when the individual attained at most 'Good' grade in the academic track and for the students with at least 'Excellent' grade in the vocational track. In both cases there is a difference of 20 percentage points between students with parents with tertiary education and those with parents with no studies. Parental education exerts the lowest effect when the individuals got 'Pass' in the vocational track. In this case, the difference in probability between having a parent with tertiary education or both parents with no studies amounts to 5.5. For those individuals that obtained 'Honors' in the academic track the maximum difference in probability due to parental education is 7.3 percentage points. Therefore, the son of parents without studies that managed to obtain 'Honors' in the academic track has a significant lower probability to enter a long program than the son of parents with tertiary education that attained the same grade. To evaluate whether this is a large or small difference is not trivial. However, we obtain that it is positive and significant. Therefore, we can conclude that equality of opportunity is not achieved

even for those students with best grades in the academic track, which should be those with the easiest access to a long program.

The effect of the grade in secondary education on the probability to study a long program is represented in the graph as the dispersion of the lines within a level of parental education. It is interesting to observe that grades matter the most for those in the academic track and low educated parents and those in the vocational track with best parental background. Differences in the probability to study a long program across grades in secondary education get above 50 percentage points in these cases. Moreover, differences in grade in secondary education explain as much as 38 percentage points' difference in the worst case.

4.2 Prestige of the program

Our second dependent variable is the prestige of the study program. We test whether the parental education level influences the choice of an academically prestigious program. We compute a level of prestige for each program defined by its length, its field of study and university using the empirical Bayes prediction, as explained in section 3. Then we estimate a linear regression using ordinary least squares.

As before, we estimate three different models. In model 1, we include father's education level. Model 2 includes instead the highest level of education of the parents, while model 3 includes both the education level of father and mother. We control for gender, age in all equations, and track and grade in secondary education when computing the net effect of parental background on academic prestige of the program. Results are reported in Table 3.

In contrast to the long vs. short program results, where gender proves not statistically significant, girls are around 10 percentage points less likely to graduate from an academically prestigious program. This may be the result of the little enrolment of girls into traditionally prestigious fields such as engineering and the over-enrollment of girls into generally less prestigious programs such as education studies (Smyth and Steinmetz 2008).

When having studied a vocational track in secondary education, the probability to graduate from a prestigious program is also close to 10 percentage points lower than in the case of having followed the academic track. The grade from secondary education raises the probability to study a prestigious program by 34 percentage points if we compare the individual with the lowest grade (1) to an individual with the highest grade (5).

Finally, parental background has a significant role in explaining the choice of an academically prestigious program. In general, having parents with tertiary education seems to matter for this choice. Again, the gross effect of parental background is larger, but it remains still significant when including the variables on secondary education outcomes. Using model 2, the net effect of having a parent with tertiary education as compared to having parents with no studies is an increase in 5.3 percentage points in the probability to study a prestigious program. When comparing parents with secondary education to parents with no studies this number goes down to only 2.2

percentage points. Moreover, model 3 reveals that father's education has a slightly larger impact on the probability of graduating from a prestigious program than mother's education has.⁸

Table 4 reports the results when we perform the analysis by gender. In this case we obtain that following a vocational track gives a lower probability of graduating from a prestigious program for girls than for boys. Moreover, grades are more important for boys than girls in graduating from a prestigious program.

The most striking result is that parental background is hardly significant in the male sample, while strongly so in the female sample. There seems to be close to equality of opportunity for males in the choice of a prestigious program in Spain. Yet, father's education influences the choice of female students strongly. *Ceteris paribus*, a girl with at least one parent with tertiary education has 6.5 percentage points higher probability to study a prestigious program than if parents had at most primary education (model 2). The difference is around 3 percentage points when parents have at most secondary education.

Table 5 presents a summary of the main results. It reports the maximum differences in probability due to the effect of several variables of interest on graduating from a long program and a prestigious program. Different grades in secondary education lead to the largest differences in the probability to graduate from both, a long and a prestigious program. Differences in the track of secondary education exert the second largest effect on these choices. The absolute effect is however four times larger for the case of choosing a long program than a prestigious program. Gender differences are relevant only in explaining the choice of a prestigious program. Finally, the main variable of interest in this paper, parental education, has a significant effect on the choice of a long program that amounts to 20 percentage points. In the case of the choice of a prestigious program, the effect of parental education on girls' choice doubles that in boys' choice.

⁸ Recall that the estimation is a linear regression in this case, so the size of the coefficients tells us directly the marginal effects of each variable.

Table 3. Coefficients of OLS estimation. Dependent variable: Academically prestigious program.

	Model 1		Model 2		Model 3	
	Gross	Net	Gross	Net	Gross	Net
Female	-0.099*** (0.009)	-0.099*** (0.008)	-0.100*** (0.009)	-0.099*** (0.008)	-0.100*** (0.009)	-0.099*** (0.008)
Age	0.022*** (0.002)	0.029*** (0.002)	0.023*** (0.002)	0.029*** (0.002)	0.023*** (0.002)	0.029*** (0.002)
Vocational track		-0.098*** (0.012)		-0.099*** (0.011)		-0.097*** (0.012)
Grade in second. educ.		0.085*** (0.004)		0.085*** (0.004)		0.084*** (0.004)
Father's education=1	0.003 (0.014)	0.012 (0.013)			0.004 (0.018)	0.010 (0.016)
Father's education=3	0.025** (0.010)	0.022** (0.009)			0.016 (0.010)	0.017* (0.010)
Father's education=4	0.074*** (0.010)	0.053*** (0.009)			0.048*** (0.012)	0.038*** (0.011)
Max par. education=1			0.012 (0.017)	0.024 (0.016)		
Max par. education=3			0.030*** (0.010)	0.022** (0.009)		
Max par. education=4			0.073*** (0.010)	0.050*** (0.009)		
Mother's education=1					0.003 (0.017)	0.006 (0.015)
Mother's education=3					0.023** (0.011)	0.014 (0.010)
Mother's education=4					0.049*** (0.013)	0.028** (0.013)
Constant	-0.272*** (0.061)	-0.700*** (0.062)	-0.288*** (0.061)	-0.708*** (0.062)	-0.287*** (0.061)	-0.706*** (0.062)
Adj.R-squared	0.105	0.220	0.105	0.219	0.108	0.220
Observations	3292	3292	3292	3292	3292	3292
AIC	-545.9435	-995.7401	-545.9668	-993.8996	-555.3018	-995.6549
BIC	-509.348	-946.9461	-509.3713	-945.1056	-500.4086	-928.5631

* p<0.10, ** p<0.05, *** p<0.01, robust standard errors in parenthesis.

Parental education: 1- no studies, 2- primary education, 3- secondary education, 4- tertiary education.

Table 4. Coefficients of OLS estimation by gender. Dependent variable: Academically prestigious program.

	Model 1		Model 2		Model 3	
	Male	Female	Male	Female	Male	Female
Age	0.025*** (0.003)	0.032*** (0.002)	0.025*** (0.003)	0.032*** (0.002)	0.025*** (0.003)	0.032*** (0.002)
Vocational track	-0.079*** (0.021)	-0.116*** (0.012)	-0.079*** (0.021)	-0.116*** (0.012)	-0.079*** (0.021)	-0.113*** (0.012)
Grade in second. educ.	0.100*** (0.007)	0.075*** (0.005)	0.100*** (0.007)	0.076*** (0.005)	0.099*** (0.007)	0.075*** (0.005)
Father's education=1	0.028 (0.024)	-0.001 (0.015)			0.013 (0.031)	0.004 (0.018)
Father's education=3	0.005 (0.016)	0.033*** (0.011)			0.003 (0.017)	0.026** (0.012)
Father's education=4	0.032* (0.016)	0.065*** (0.011)			0.016 (0.021)	0.051*** (0.013)
Max par. education=1			0.042 (0.028)	0.009 (0.019)		
Max par. education=3			0.011 (0.017)	0.029*** (0.011)		
Max par. education=4			0.032** (0.016)	0.061*** (0.011)		
Mother's education=1					0.026 (0.028)	-0.006 (0.018)
Mother's education=3					0.002 (0.019)	0.020* (0.012)
Mother's education=4					0.037 (0.023)	0.024 (0.015)
Constant	-0.615*** (0.104)	-0.850*** (0.074)	-0.616*** (0.104)	-0.864*** (0.074)	-0.609*** (0.104)	-0.858*** (0.074)
Adj.R-squared	0.163	0.187	0.163	0.185	0.163	0.188
Observations	1152	2140	1152	2140	1152	2140
AIC	-202.3851	-819.4515	-202.9584	-814.4695	-200.3743	-818.0628
BIC	-167.0403	-779.7716	-167.6136	-774.7896	-149.8818	-761.3771

* p<0.10, ** p<0.05, *** p<0.01, robust standard errors in parenthesis.

Parental education: 1- no studies, 2- primary education, 3- secondary education, 4- tertiary education.

Table 5. Largest differences in probabilities due to each variable (in percentage points).

Variable	Long program	Prestigious program		
		All	Male	Female
Gender	0	10	--	--
Vocational track	40	10	8	11
Grade in secondary education	55	34	40	30
Parental education	20	5.3	3.2	6.1

5. Conclusions

Spain has seen a large educational expansion in tertiary education since the Act on University Reform (*Ley de Reforma Universitaria, LRU*) in 1983 (Perotti 2007). Despite this increase in the

access to university, we find that equality of opportunities is hindered by the influence of parental background on the choice of tertiary education program. Understanding the role of parental background is especially important in Spain given that more than 47% of parents have at most primary education.

In this paper we analyze two educational choices: long vs. short program and academic prestige of the program. Our results show that those individuals with better-educated parents are more likely to choose a long program. Those with best grades in the vocational track and those with worst grades in the academic track benefit the most from their parental education in this case. With respect to program prestige, parental education has a limited role in explaining boys' decisions, while it does affect girls' probability to graduate from a prestigious program.

Our results identify significant differences in the type of study program due to parental education within a sample of graduates. To analyze equality of opportunity we should add the effect of parental background on the probability to access tertiary education, which has been shown by other studies to be significant in Spain (Albert 2000; Rahona-López 2009). Therefore, equality of opportunity is far from achieved in tertiary education in Spain.

Moreover, we find that parental background has a larger effect in the choice between long and short program rather than in the choice of prestige of the program. This suggests that the mechanism driving these results is that individuals from less educated families find it optimal to study short programs in order to minimize risks and time opportunity costs as proposed by rational choice theory. In this respect, the implementation of the Bologna process, which substituted the old degrees ('Licenciatura' and 'Diplomatura') for the 4 year new degrees ('Grado') in Spain is potentially a good step towards equality of opportunity, as long as it does not deter students from poorer parental background to enter tertiary education. We believe this is an interesting avenue of research for the near future.

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APPENDIX

Table A1. Predicted probabilities to study a long program based on model 2.

	Academic track	Vocational track
	grade secondary educ=1	grade secondary educ=1
Edumax=1	0.2959 [0.2193, 0.3725]	0.0488 [0.0254, 0.0721]
Edumax=2	0.3218 [0.2709, 0.3727]	0.0547 [0.0325, 0.0770]
Edumax=3	0.4192 [0.3585, 0.4799]	0.0809 [0.0478, 0.1140]
Edumax=4	0.4886 [0.4262, 0.5509]	0.1044 [0.0623, 0.1465]
	grade secondary educ=2	grade secondary educ=2
Edumax=1	0.4508 [0.3664, 0.5352]	0.091 [0.0520, 0.1300]
Edumax=2	0.481 [0.4350, 0.5270]	0.1016 [0.0660, 0.1371]
Edumax=3	0.585 [0.5356, 0.6345]	0.1467 [0.0959, 0.1976]
Edumax=4	0.6511 [0.6058, 0.6963]	0.1854 [0.1236, 0.2472]
	grade secondary educ=3	grade secondary educ=3
Edumax=1	0.6159 [0.5357, 0.6960]	0.1636 [0.1012, 0.2260]
Edumax=2	0.6442 [0.6037, 0.6846]	0.1809 [0.1262, 0.2356]
Edumax=3	0.7336 [0.6953, 0.7719]	0.2514 [0.1788, 0.3241]
Edumax=4	0.7847 [0.7532, 0.8162]	0.3077 [0.2253, 0.3902]
	grade secondary educ=4	grade secondary educ=4
Edumax=1	0.7579 [0.6916, 0.8243]	0.2764 [0.1845, 0.3683]
Edumax=2	0.7795 [0.7427, 0.8164]	0.3013 [0.2230, 0.3796]
Edumax=3	0.8432 [0.8128, 0.8736]	0.3962 [0.3033, 0.4891]
Edumax=4	0.8768 [0.8533, 0.9003]	0.4648 [0.3685, 0.5610]
	grade secondary educ=5	grade secondary educ=5
Edumax=1	0.8595 [0.8105, 0.9085]	0.4273 [0.3094, 0.5452]
Edumax=2	0.8735 [0.8426, 0.9045]	0.4572 [0.3586, 0.5559]
Edumax=3	0.9131 [0.8899, 0.9362]	0.5617 [0.4601, 0.6632]
Edumax=4	0.9329 [0.9155, 0.9503]	0.6291 [0.5337, 0.7244]

Parental education: 1- no studies, 2- primary education, 3- secondary education, 4- tertiary education.
 Grade secondary education: 1- Pass (Suficiente), 2- Good (Bien), 3- Very good (Notable), 4- Excellent (Excelente), 5- Honors (Matrícula de Honor).