

Gender differences in the intergenerational transmission of education in Spain: the role of parents' employment status and education

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Abstract

This article examines the influence of parents' education and employment status on the attained educational level of their children with special reference to gender differences. Our study analysed what determined the probability of Spanish young people completing university education. The study used a sample of 132,421 observations of people under the age of 28 not in any type of training or education selected using anonymised microdata from the most recent national population and housing census. An ordered probit model was used to capture the effect of various socioeconomic, environmental and cultural variables on the advancement and attainment of educational level according to gender. The results show that the most important variable in academic progress is the parents' educational level and that the mother's education level has a greater influence. Additionally, parental employment instability was found to be what most inhibits a child's academic progress.

Keywords: university education, family influence, socioeconomic environment, gender differences

1. Introduction

Economic analysis tells us that individuals also optimise when making decisions about their education since they adapt the costs of the education to its expected benefits. A family's socioeconomic background and environment therefore play a determining role in optimising the level of education individuals reach in their aim to maximise wealth (Lazear, 1980). In general, the influence of parents on the adult socioeconomic attainment of their children occurs through two channels: endowments and investments. Endowments being any parental resource or characteristic that children can potentially benefit from (economic and physical resources, human or cultural capital, social status, networks, and genetic background, etc.), and investments being parental behaviour aimed at influencing child outcomes.

The effects of the socioeconomic characteristics of the family and the labour market on demand for education have not received a great deal of research attention due to the paucity of databases that combine this type of information. One of the first studies was by Willis and Rosen (1979), who used a database of US war veterans and concluded that lifetime expected earnings together with family background indicators influence the decision to go to university. Lauer (2003) used an ordered probit model to study the effect of family socioeconomic characteristics, birth cohort and parental education on the level of education of children in Germany and France, and Smith et al. (2016) studied the effect of family background and education in young adults' schoolwork transitions using logistic regressions. Stull (2013) investigated the direct effects of the family's socioeconomic status and the indirect effects generated in the school itself on the educational achievement of children, finding that the direct effects are greater than the indirect ones.

In Spain, Peraita and Sánchez (1998), Albert (2000), and Rahona (2006) have studied the effects that family socio-economic background, the labour market, and the geographical and cultural environment have on levels of completed education, among others. All these studies were based on data sources available in the 1990s (Economically Active Population Survey and Household Budget Survey). However, data now available from the Spanish Population and Housing Census 2011 (INE, 2013) mean researchers can update this research and explore the effects of other variables on the probability of completing a university education.

Our study used the latest Spanish Population and Housing Census, making it the first study to analyse the influence of parental education and employment status as determinants of child education, together with variables such as wealth, size of municipality of residence and the presence of siblings. We performed the analysis for

Spain by applying a large number of variables and observations from the 2011 census. The size of the sample means that the results obtained are robust and reliable as the statistics from the estimations confirm.

This study used ordered probit models with microdata taken from the Population and Housing Census 2011 to estimate the effects of families' socioeconomic, cultural and environmental background on the level of education attained by Spanish youths under 28. The use of an ordered probit model was justified as the dependent variable analysed was ordinal. This was because the levels of education attained were sequential over time. The analysis particularly focused on the effects of parental education level and employment status and municipality size on the probability of completing university education according to gender, a variable that turned out to be determinant in the analysis.

2. Data and information source

Our study used anonymised microdata from the Population and Housing Census 2011, published by the Spanish Statistical Office (INE) in 2013, for creating the variables for the estimations. This was the first time that the Spanish authorities carried out a census under European legislation. Therefore, the results are comparable within the EU. This census collected administrative records, mainly from municipal registers, with a large sample survey of 5,797,425 individuals, 12.3% of the population. The census statistics offer an abundance of variables, 51 on people, 13 on dwellings and 16 on buildings.

The sample selected for this analysis contained over 130,000 observations and 22 variables in several categories. The study used information on the characteristics of the people analysed, their parents and the housing in which they lived. The anonymised microdata format allowed us to perform the econometric analyses necessary for the lines of enquiry set up in the study. Furthermore, because the data comes from the most prestigious statistical institution in Spain, the National Statistics Institute, its quality is guaranteed. The sample selected for the estimations comprised the national population under the age of 28 (as most who had started university will have finished by this age), living in the family home, who were either a son or a daughter and who were not currently studying, formally or otherwise.

[Table 1 near here]

Table 1 presents the descriptive statistics for the population sample used in the estimations. The sample comprised 132,421 sample observations, corresponding to 1,419,385 population observations. By gender, 57.7% were men and 42.3% women. In terms of completed education, the largest group, 32.9%, had completed compulsory

secondary education, followed by primary education (16.2%), post-compulsory secondary school and university education (14.9%), and intermediate and higher vocational training (12.2% and 8.8%, respectively).

Parental educational level is the main long-term determinant of children's educational success. In other words, the progenitors' level of education has the greatest bearing on the level of education the next generation will attain, as several studies have verified (Haveman and Wolfe, 1995; Huang, 2013) and this study confirms. Data in our sample for this variable show that mothers reached the highest levels of education, the largest group having completed secondary education (63.2% of mothers and 52% of fathers), followed by primary education (18.8% of mothers and 16.1% of fathers). Finally, 8.7% of mothers and 7.3% of fathers had completed university.

Regarding *parental employment status*, employees with a permanent contract represented the largest group in the sample of men and women. Those in employment represented the largest category, although mothers in the unemployed category accounted for around 20% of the sample and population observations.

The variable *wealth* is a discrete variable taking the values zero to four, according to how many of the four selected items apply to the dwelling. These four items are usable space in excess of 100 m², mortgage-free ownership, central heating and the internet in the home. The majority of the dwellings, 33%, had two of the four characteristics, followed by 31.8% with three items and 19.4% with one. Families in dwellings with all four of the items defining the wealth variable made up 10.1% of the total, whereas 5.7% had none of the items.

The *number of siblings* is also a discrete variable taking the values zero to four according to the number of siblings a person has. The sample differentiated between older and younger siblings: 71.1% of the population had no older sibling and 25.9% had just one, while 50.7% had no younger sibling and 40.2% had just one; 7.8% had two younger siblings.

Size of municipality is a dummy variable that takes a value of 1 if the population is over 20,000 inhabitants and zero otherwise. Approximately 50% of the sample lived in municipalities with more than 20,000 inhabitants (65.1% of the population).

Finally, because students born in the same year are of different ages, a dichotomous variable was included that takes values 0 or 1, depending on which half of the year or semester a person was born in, to examine whether this variable has any effect on

educational success. Approximately 50% of the sample was born in the first half of the year.

3. The ordered probit model for estimating education level

An ordered methodology was perfect for the requirements of the nature of our data because the dependent variable was a six-category ordered measure of educational attainment. Ordered probit models consider the ordinal nature of the dependent variable explicitly. Therefore, using ordered probit techniques is suitable for estimating the observed levels of education attained organised into hierarchical categories (See Tansel, 2002; Dreze and Kingdon, 2001; Maitra, 2003, Williams, 2006, Buscha and Conte, 2014). Applying the ordinary least squares would have been unsuitable because this method assumes that the dependent variable is continuous and unlimited. Thus, it would have posed the incorrect hypothesis that the level of schooling attained follows a linear expected value (Tansel, 2002).

To illustrate the econometric specification of an individual's level of education (y_i) we used an ordered probit model constructed around the following latent variable regression:

$$y_i^* = \beta x_i + \varepsilon_i \quad (1)$$

where y_i^* is the unobserved dependent variable. In practice, the censored variable y_i and the level of education completed by individual i can be observed.

$$\begin{aligned} y_i &= 0 \quad \text{if } y^* \leq u_0 \\ y_i &= j \quad \text{if } u_{j-1} < y_i^* \leq u_j \quad j = 1, 2, \dots, 5 \end{aligned} \quad (2)$$

where, after normalisation, $u_0 = 0$. The unknown parameters u_j are estimated with β ; the vector x_i contains quantifiable independent variables reflecting family background and the conditions of the reference employment market for individual i . The term ε represents some other unobservable factors.

Given the normal function associated with the random disturbance, the model was estimated using a standardised normal distribution function (probit model) with zero mean and variance equal to 1. The following expression reflects the probability of individual i attaining education level j :

$$Prob [y_i = j] = \left(\frac{1}{\sqrt{2\pi}} \right) \int_{-\infty}^{\alpha + \beta x_i} e^{-z^2/2} dz \quad (3)$$

Expression 3 was used to analyse the impact of various socioeconomic characteristics on the probability distribution of the level of education attained. In addition, to discover the marginal effects of a significant dummy variable, the probabilities obtained when the variable takes one of its values (0 or 1) had to be compared with those obtained when the remaining continuous variables were located within the sample means and the other dummy variables were omitted. Recall that the probabilities of men and women sum to one. Therefore, the marginal effects associated with a change in the regression coefficients must sum to zero.

The education levels considered and associated with each value of the dependent variables were as follows:

$y_i=0$ if individual i completed primary education

$y_i=1$ if individual i completed compulsory secondary education

$y_i=2$ if individual i completed intermediate vocational training

$y_i=3$ if individual i completed post-compulsory secondary education

$y_i=4$ if individual i completed higher vocational training

$y_i=5$ if individual i completed university education

The vector x_i contains two groups of explanatory variables. The first group contains variables that reflect personal characteristics, such as gender, birth semester, total number of siblings (and how many are younger or older than the reference sibling). The variables in the second group reflect socioeconomic characteristics like the size of the municipality where the family lives, employment status and educational level of both parents, and family wealth. As mentioned previously, the latter is a *discrete quantitative variable*, constructed from the values of four questions on primary residence in the Population and Housing Census 2011. The first variable takes the value 1 if the dwelling has a usable space in excess of 100 m²; the second refers to mortgage-free ownership of the family residence (either bought or inherited), in which case the variable takes a value of 1 and 0 otherwise. For a dwelling with individual or communal central heating, the variable takes a value of 1 and 0 otherwise. Finally, if the dwelling has internet access, the variable takes a value of 1 and 0 otherwise. The more items the dwelling has, the higher the value of the wealth variable, 0 being the value for a dwelling with none of these features and 4 being for one with all the items.

4. The results of the estimations

Table 2 presents the results of estimating the ordered probit model by gender. The table shows that the signs of the variables are in line with those obtained in the literature

on levels of completed education for the variables analysed in this study. Davis-Kean (2005) analysed the influence of the socioeconomic status—i.e. parents' education and income—on the child's academic achievement through the parents' beliefs and behaviours and found that the process of these relationships was different depending on the gender of the children. To perform an exhaustive analysis of the probabilities, the associated marginal effects must be calculated since the estimated coefficients provide little information except in relation to the sign.

[Table 2 near here]

The first column of Table 2 reports the joint estimation for both genders. However, since the gender variable is significant, we can estimate the above equation for men and women separately. The coefficient associated with the *male* category in the gender variable is negative and statistically significant, indicating that being male, all other things being equal, reduces the probability of educational success.

Similarly, the coefficient associated with the father's employment status (self-employed or employee with a permanent contract), is positive and statistically significant, indicating that, other things being equal, children whose fathers are in stable employment, as opposed to on temporary contracts, are more likely to achieve higher levels of education. The same conclusions hold for the mother's employment status, although the effect of employment status is greater in the case of fathers. This result can be attributed to the more precarious situation of women in the Spanish labour market compared to men since on average a greater proportion of women hold temporary jobs with lower remuneration and less social recognition than men. In sum, precarious parental employment status negatively affects the level of education children attain. The explanation for this finding lies in the relationship of temporary employment with low wages and, therefore, low household income, which equally affects a child's educational success.

The coefficient associated with the variable for siblings is negative and statistically significant, indicating that having siblings may be an obstacle to reaching higher levels of education. The higher coefficient value in the case of older siblings shows a particularly marked negative influence if siblings are older. This result coincides with findings from studies by Black et al. (2005), Booth et al. (2009) and De Haan (2010). The positive and significant value for the wealth variable suggests that the greater the family wealth, the more likely children are to reach higher levels of education. Finally, the semester of birth is not significant and therefore does not appear to be a relevant variable.

The parental educational level had the greatest impact on the probability of children completing university, reaching upper level of education or being successful in their studies. The explanation for this finding may be that parents with higher levels of education tend to place greater value on education and probably encourage their children to study to reach higher levels. Studies that analyse educational performance with PISA data find that children's academic performance correlates with the parental level of education. This is due to the better quality and quantity of parental support for children's schoolwork from university-educated parents. In addition, the effect of the mother's level of education on the probability of children going to university was higher than that of the father in our study, a result that coincides with findings in the previous literature (Duncan, 1994; Kodde and Ritzen, 1994; Lauer, 2003; Holmlund et al., 2011). Similarly, educational expansion has been responsible for a more significant share of increasing social fluidity in women (Gil-Hernández et al., 2017).

Finally, as expected, a positive relationship was found between municipality size and attaining a higher level of education. This result can be explained by the wider access to centres of education (wider range of schools, colleges, universities; better transport links, etc.) that enable people to complete their studies more easily if they live in larger municipalities.

Columns 2 and 3 display the estimations of the ordered probit model for the subsample of men and women, respectively. The comments referring to the joint estimation of the two genders are all valid, except in reference to the gender variable, as it does not appear in these two estimations.

[Table 3 near here]

Table 3 reports the marginal effects of the estimation of the ordered probit model for level of completed education and gender. In the case of the lowest educational level, men were 9.5% more likely than women to achieve primary studies. The parental employment status most strongly associated with children reaching primary education level only was being an employee on a temporary contract since the values for all the other employment statuses were negative in this completed education category. Having older siblings increased the probability of achieving a lower level of education by 3.5%, whereas the increase was 1.2% if siblings were younger. The wealth variable lowered the probability of completing only primary education by 4.2%, and parental educational level above illiterate or no education reduced this probability by between 1% and 10.2% in the case of fathers and between 3% and 11.8% in the case of mothers, depending on their level of completed education. Finally, residence in municipalities with populations over 20,000

reduced the probability of completing only primary education by 2% compared to municipalities with fewer inhabitants.

These results show that there are gender differences in the intergenerational transmission mechanisms of parental socioeconomic status to the education of the children. Thus, our results are in line with the study of Kleinjans (2010), which presents empirical evidence from Denmark that the socioeconomic status of parents and their children are more correlated for sons than for daughters. Moreover, our results suggest that there are different mechanisms for the intergenerational transmission of socioeconomic status: one being parental income and one being parental education.

In general, as the predicted level of completed education rises, the gender shift variable became negative, meaning that women were more likely to reach higher stages of education. The shift to positive values as the predicted level of completed education rises shows how a family's unstable employment situation (employee on a temporary contract in the employment status variable) is an obstacle to children advancing educationally. Similarly, having siblings, whether older or younger, may also be a hurdle to progress in education, particularly when the siblings are older.

As expected, family wealth facilitated the achievement of higher levels of education. With better-educated parents, the sign of the marginal effect changed as the predicted level of education rose, such that the higher the parents' educational level, the greater the probability that children would complete a higher level of education. The size of the municipality of residence also had a determining effect, changing from negative to positive with the intermediate vocational training and increasing in value as the expected levels of education increased.

Turning to university education, men were 9.7 percentage points less likely to complete university studies than women. Any category of the parental employment status variable other than temporary contract had advantages for completing university degree education. Percentages range from 4% in the case of a self-employed father to 2.3% in the case of mothers who ran their own businesses, as compared to temporary contracts. Having siblings meant a reduction in the probability, ranging from 3.3% if the sibling was older to 1.1% if they were younger. Residence in a municipality with a population of over 20,000 increased the probability by 1.8% over municipalities with fewer inhabitants. However, the variable with the most significant influence on children completing university was their parents' educational level. Children of a father with a university education were 17.5% more likely to complete university than those whose fathers were illiterate or have no schooling. This probability rose to 22.5% in the case of the mother.

Looking at all the levels of education in sequence clearly shows the trend of the marginal probability effects on the control variables. With regard to gender, women had an advantage over men in their level of qualifications, while men had a differential probability of 9.5% of attaining the lowest degree of education (primary). This percentage drops to 8.4% in the case of compulsory secondary education and becomes negative in the case of intermediate vocational training (-0.7%). From post-compulsory secondary school upwards, women had a clear advantage over men, with percentages ranging from 3.7% at this level to 9.7% at university.

The trend in parental employment status is also clear: lower levels of completed education (primary and compulsory secondary) were associated with parents on temporary contracts, whereas for more highly educated people, any employment status other than employee with temporary contract was an advantage. Therefore, parents' employment instability obstructs the educational progress of young people. This inverse relationship between family size and the level of education completed by children coincides with results of studies conducted in other countries (Rosenzweig and Wolpin, 1980; Bauer and Gang, 2001; Lee, 2008). Therefore, having siblings emerges as an obstacle to completing higher levels of education and, in the case of older siblings, this effect is more extreme. In our study, it reduced the probability by up to 3.5% more than for young people with no siblings, whereas having younger siblings decreased it by up to 1.2%.

Similarly, albeit in the opposite direction, family purchasing power, represented by the wealth variable, was found to facilitate a young person's educational development. Thus, higher household income implied a rise of up to 4% in the probability of completing increasingly higher stages of education. The results for place of residence follow a similar pattern: living in municipalities with populations over 20,000 increased the probability of completing higher levels of education by up to 2%.

The parental educational level variable has the largest influence, although the effect of the mother's higher educational level is stronger than the father's (Korupp et al., 2002; Erola et al., 2016). Hence, in our study, if the father completed primary education only, the increase in the probability of his children going on to higher levels of education surpassed the baseline reference by 1% (illiterate and no studies). However, if the mother completed only primary education, this percentage went up to 3%. If the father finished secondary school, that probability rose to 6.5%, whereas the same calculation for the mother was over 11%. Finally, a father with a higher or tertiary level of education boosted his child's probability by up to 17.5%, a probability that grows to 22.5% in the case of a mother with tertiary education.

Parents' education level was found to be an important socioeconomic factor to take into consideration in welfare policy when looking at schooling attainment of the children. Welfare policies should increase the incentives to families who wish to obtain additional education for their children (Broer et al., 2019) because any schooling attainment gap between students should reflect only differences in their abilities or efforts and not an educational inequality due to parental education, family income or parental employment status.

5. Probability distribution of levels of completed education

Figure 1 presents the probability distribution predicted by the model for the levels of completed education for men and women. A comparison of the values for men and women reveals how the probability distribution for women shifts to the right, indicating that women have a greater probability of completing higher levels of education than men complete. The highest predicted probabilities of completed education in the case of women were for compulsory secondary education (29%), followed by university education (20.4%). Men were also most likely to reach compulsory secondary education (40%), followed by primary education (17.5%), while university education, together with intermediate vocational training, registered the lowest values at 7.9% of predicted probability.

Based on the predicted probabilities and making some changes in the categories of the regression variables, we estimated the probability of individuals with different personal, economic and educational characteristics completing a certain level of education. Figure 2 displays the predicted probabilities of completing compulsory education and university for men and women for the variables of parental completed educational level and employment status.

[Fig. 1 near here]

[Fig. 2 near here]

Figure 2 shows a notable difference between men and women. This is because the predicted probability started with a difference of 12.5 percentage points in favour of women in the case of university education, and 11 percentage points in favour of men when compulsory secondary education was considered. Thus, if instead of having a temporary contract the father was self-employed, the probability that his child would complete university education rose to 10.7%, and the probability that the child completed just compulsory secondary education fell to 37.3%. In the case of the mother, the probability shifted only to 9.3% in the case of university education and dropped to 38.7% for compulsory secondary education.

There are large differences in parental levels of education. In the case of men, the probability of completing university education increased to 24.3% if the father finished tertiary education, and up to 29.2% if the mother did. In the case of completing compulsory secondary, there was a fall of around 15 percentage points in the predicted probability as the level of parents' completed education rose. In the case of women, the fall in the predicted probability of completing compulsory secondary education as parental educational level rose was lower since they started from considerably lower values than men did with reductions of around 11%. The increase in the predicted probability associated with women completing university education if the father had tertiary studies was 37.8%, which although higher than the figure for men, was lower than the value of 42.9% when the mother completed tertiary education. As shown by studies based on data for liquidity constraints facing households (Checchi et al., 2013, and Chevalier and Lanot, 2002), it would seem logical to suppose that this positive relationship between the education of parents and children will be lower if the impact of liquidity constraints facing parents with lower levels of education is incorporated.

6. Conclusions

This study explored the influence that parents' educational level and employment status have on the level of education completed by their children. Specifically, we estimated the probability of young Spaniards completing university education according to certain family characteristics. We selected a sample of people under 28 not in any type of education or training using anonymised microdata from the Spanish Population and Housing Census 2011. Estimations were made using ordered probit models to capture the effect of various socioeconomic, environmental and cultural variables on the accomplishment and progression of educational level according to gender. The gender variable turned out to be particularly important in the analysis. Our results show that the parental education variable has the greatest impact on the progress of children's level of completed education and that the mother's level of completed education has a higher influence. Parents' employment instability, represented by temporary employment contracts, was found to be one of the variables associated with the greatest negative effect on the level of education reached by children.

The results of the analysis on the level of education completed by Spanish young people show that, all other things being equal, women are far more likely to complete university education than men. The positive effect of the mother's level of education on the probability that her children would finish university was significantly larger than the same effects in the case of the father. Likewise, the influence of parents' employment status on the probability that their children would finish university was lower than the

influence of the parents' degree of education, although there were significant differences between the effects of the father's and the mother's employment status. We found that the positive effect of employment status on the level of education completed by children was higher for the father than for the mother. However, when considering the educational level of the parents, the effect worked inversely; the mother's educational level had a greater positive effect on the education of the children than the father's.

The analysis of other family characteristics showed that the number of siblings is detrimental to the probability of completing university education and that having older rather than younger siblings has a greater impact. This was even more the case for women in our sample. The effect of the family's wealth on the probability of completing university education was positive and, as with the previous variable, it had a more significant impact for women than men in our study. Finally, the size of the municipality where the family lives had the least positive impact of the variables considered on the probability of young people completing university, although in this case the effect was greater for men.

We found that the probability that children would finish university studies increased more as the father's employment status increased compared to the corresponding increases for the mother. However, in the case of parental education level, the effect of the mother's degree of education on the probability that her children would complete university was much higher than for the father. The study estimated the probabilities of men and women completing compulsory secondary education and university according to the effects of the father's and the mother's employment status and level of education. The differences found between men and women were considerable. Our estimates suggest that, with family characteristics remaining constant, women are about 12 percentage points more likely to complete university studies than men. However, the probability of men completing compulsory secondary education only is 11 percentage points higher than the probability for women.

The results of the study have some important policy implications in several fields. First, with regard to gender policies, the study reveals the continuing importance of women's role as mothers in the educational success of their children, highlighting that in many households the essential support children need with their schoolwork falls largely to women. Thus, we need to rethink the roles ingrained in our society and develop joint responsibility actions at home supported by policies aimed at facilitating the reconciliation of family and professional life.

Second, in relation to education policies, the results show that access to higher education in Spain is far from equal for everyone and that family socioeconomic status

or background is a determinant factor in educational success. Thus, these results underline the need to design policies that guarantee academic success regardless of gender, nuclear family size, income level or size of the municipality of residence.

These policies have to integrate scholarships, subsidies and tax incentives to improve the conditions of those worst off (in larger families, with low-income levels or who live in smaller municipalities). Only by introducing policies of this type will it be possible to move towards a society that fully guarantees equal opportunities for everyone.

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Table 1

Target population's descriptive statistics.

Source: Own elaboration based on Spanish Population and Housing Census 2011 (INE, 2013).

		Number of observations	Sample Percentage
Sex			
	Male	76.423	57,7
	Female	55.998	42,3
	Total	132.421	100,0
Educational attainment level			
	Primary	21.512	16,2
	Lower secondary	43.625	32,9
	Vocational secondary education	16.207	12,2
	Upper secondary	19.725	14,9
	Short-cycle tertiary vocational education	11.633	8,8
	University	19.719	14,9
	Total	132.421	100,0
Mother's educational attainment level			
	Non applicable	6.589	5,0
	Illiterate and without studies	5.651	4,3
	Primary	24.906	18,8
	Secondary	83.735	63,2
	Tertiary	11.540	8,7
	Total	132.421	100,0
Father's educational attainment level			
	Non applicable	27.113	20,8
	Illiterate and without studies	4.844	3,7
	Primary	21.300	16,1
	Secondary	69.326	52,0
	Tertiary	9.838	7,3
	Total	132.421	100,0
Mother's employment status			
	Non applicable	6.589	5,1
	Employer	4.602	3,4
	Self-employed	8.138	6,1
	Permanent employees	48.746	36,7
	Temporary employees	33.593	25,4
	Inactive	30.753	23,3
	Total	132.421	100,0
Father's employment status			
	Non applicable	27.113	20,5
	Employed	11.850	8,9
	Self-employed	14.551	11,0
	Permanent employees	59.042	44,6
	Temporary employees	19.865	15,0
	Total	132.421	100,0
Wealth (number of items)			
	0	7.523	5,7
	1	25.728	19,4
	2	43.733	33,0
	3	42.058	31,8
	4	13.379	10,1
	Total	132.421	100,0
Older siblings			
	0	94.151	71,1
	1	34.275	25,9
	2	3.606	2,7
	3	329	0,2
	4 or more	60	0,0
	Total	132.421	100,0
Younger siblings			
	0	67.098	50,7
	1	53.219	40,2
	2	10.329	7,8
	3	1.390	1,0
	4 or more	385	0,3
	Total	132.421	100,0
Semester of birth			
	1 st	65.389	49,4
	2 nd	67.032	50,6
Total	Total	132.421	100,0
Municipality size			
	20.000 inhabitants or less	67.117	50,7
	Over 20.000 inhabitants	65.304	49,3
	Total	132.421	100,0

Table 2

Educational attainment level: ordered probit model analysis. Coefficients

Source: Own elaboration based on Spanish Population and Housing Census 2011 (INE, 2013).

Dependent variable: Educational attainment level (y= 0, 1,...,5)					
		Total	Male	Female	
Sex. Reference: Female	Male	-0,451 ***			
Father's employment status. Reference: Temporary employees	Non applicable	0,240 ***	0,285 ***	0,182 ***	
	Employer	0,179 ***	0,172 ***	0,193 ***	
	Self-employed	0,178 ***	0,145 ***	0,229 ***	
	Permanent employees	0,183 ***	0,196 ***	0,168 ***	
Mother's employment status. Reference: Temporary employees	Non applicable	0,336 ***	0,395 ***	0,258 ***	
	Employer	0,106 ***	0,088 ***	0,134 ***	
	Self-employed	0,093 ***	0,099 ***	0,093 ***	
	Permanent employees	0,095 ***	0,100 ***	0,088 ***	
	Inactive	0,068 ***	0,075 ***	0,062 ***	
Siblings Reference: no siblings	Older	-0,162 ***	-0,130 ***	-0,205 ***	
	Younger	-0,054 ***	-0,056 ***	-0,050 ***	
Wealth Reference: no items	Wealth	0,193 ***	0,184 ***	0,207 ***	
Semester of birth. Reference: I semester	II semester	0,005	-0,008	0,022 **	
Father's educational attainment level. Reference: Illiterate and without studies	Primary	0,048 **	0,062 **	0,028	
	Secondary	0,296 ***	0,326 ***	0,256 ***	
	Tertiary	0,647 ***	0,743 ***	0,531 ***	
Mother's educational attainment level. Reference: Illiterate and without studies	Primary	0,145 ***	0,141 ***	0,150 ***	
	Secondary	0,480 ***	0,514 ***	0,437 ***	
	Tertiary	0,798 ***	0,907 ***	0,670 ***	
Municipality size. Reference 20.000 inhabitants or less					
	Over 20.000 inhabitants	0,090 ***	0,131 ***	0,034 ***	
μ_1		-0,124 ***	0,377 ***	-0,169 ***	
μ_2		0,960 ***	1,500 ***	0,853 ***	
μ_3		1,294 ***	1,840 ***	1,183 ***	
μ_4		1,771 ***	2,312 ***	1,668 ***	
μ_5		2,126 ***	2,720 ***	1,976 ***	
Log-likelihood		-2.257.928	1.277.393	-976.307	
N		132.421	76.423	55.998	
χ^2		16.373 ***	8.269 ***	5.336 ***	
R ² -pseudo		0,0613	0,0556	0,0448	

***, **, *: significant at 1%, 5% y 10% respectively.

Table 3

Ordered probit estimation. Marginal effects by sex and educational attainment level.

Source: Own elaboration based on Spanish Population and Housing Census 2011 (INE, 2013).

		Primary			Lower secondary			Vocational secondary education		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
Sex. Reference: Female	Male	0,095 ***			0,084 ***			-0,007 ***		
Father's employment status. Reference: Temporary employees	Non applicable	-0,049 ***	-0,068 ***	-0,029 ***	-0,047 ***	-0,045 ***	-0,040 ***	0,003 ***	0,010 ***	-0,004 ***
	Employer	-0,036 ***	-0,041 ***	-0,029 ***	-0,035 ***	-0,027 ***	-0,043 ***	0,002 ***	0,006 ***	-0,005 ***
	Self-employed	-0,036 ***	-0,035 ***	-0,034 ***	-0,035 ***	-0,022 ***	-0,051 ***	0,002 ***	0,006 ***	-0,006 ***
	Permanent employees	-0,040 ***	-0,050 ***	-0,028 ***	-0,033 ***	-0,027 ***	-0,036 ***	0,003 ***	0,009 ***	-0,003 ***
Mother's employment status. Reference: Temporary employees	Non applicable	-0,062 ***	-0,085 ***	-0,037 ***	-0,070 ***	-0,071 ***	-0,057 ***	0,000 ***	0,009 ***	-0,008 ***
	Employer	-0,022 ***	-0,022 ***	-0,021 ***	-0,020 ***	-0,013 ***	-0,029 ***	0,001 ***	0,004 ***	-0,003 ***
	Self-employed	-0,019 ***	-0,024 ***	-0,015 ***	-0,018 ***	-0,015 ***	-0,020 ***	0,001 ***	0,004 ***	-0,002 ***
	Permanent employees	-0,020 ***	-0,026 ***	-0,015 ***	-0,017 ***	-0,014 ***	-0,019 ***	0,002 ***	0,004 ***	-0,002 ***
Siblings. Reference: no siblings	Inactive	-0,014 ***	-0,019 ***	-0,010 ***	-0,013 ***	-0,010 ***	-0,013 ***	0,001 ***	0,003 ***	-0,001 ***
	Older	0,035 ***	0,034 ***	0,034 ***	0,029 ***	0,017 ***	0,044 ***	-0,003 ***	-0,006 ***	0,003 ***
Wealth. Reference: no items	Younger	0,012 ***	0,014 ***	0,008 ***	0,010 ***	0,007 ***	0,011 ***	-0,001 ***	-0,003 ***	0,001 ***
	Wealth	-0,042 ***	-0,047 ***	-0,035 ***	-0,035 ***	-0,025 ***	-0,044 ***	0,004 ***	0,008 ***	-0,003 ***
Semester of birth. Reference: I semester	II semester	-0,001 ***	0,002 ***	-0,004 **	-0,001 ***	0,001 ***	-0,005 **	0,000 ***	0,000 ***	0,000 **
Father's educational attainment level. Reference: Illiterate and without studies	Primary	-0,010 **	-0,016 **	-0,005 ***	-0,009 **	-0,009 *	-0,006 ***	0,001 **	0,003 **	0,000 ***
	Secondary	-0,065 ***	-0,084 ***	-0,043 ***	-0,053 ***	-0,043 ***	-0,054 ***	0,006 ***	0,015 ***	-0,004 ***
	Tertiary	-0,102 ***	-0,137 ***	-0,066 ***	-0,141 ***	-0,150 ***	-0,118 ***	-0,010 ***	0,004 ***	-0,022 ***
Mother's educational attainment level. Reference: Illiterate and without studies	Primary	-0,030 ***	-0,035 ***	-0,024 ***	-0,028 ***	-0,021 ***	-0,033 ***	0,002 ***	0,006 ***	-0,003 ***
	Secondary	-0,111 ***	-0,140 ***	-0,079 ***	-0,078 ***	-0,057 ***	-0,089 ***	0,012 ***	0,026 ***	-0,004 ***
	Tertiary	-0,118 ***	-0,157 ***	-0,078 ***	-0,175 ***	-0,187 ***	-0,147 ***	-0,017 ***	-0,002 ***	-0,030 ***
Municipality size. Reference 20.000 inhabitants or less	Over 20.000 inhabitants	-0,020 ***	-0,034 ***	-0,006 ***	-0,016 ***	-0,017 ***	-0,007 ***	0,002 ***	0,006 ***	-0,001 ***

***, **, *: significant at 1%, 5% y 10% respectively.

Table 3

Ordered probit estimation. Marginal effects by sex and educational attainment level (Continued).

Source: Own elaboration based on Spanish Population and Housing Census 2011 (INE, 2013).

		Upper secondary			Short-cycle tertiary vocational education			University		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
Sex. Reference: Female	Male	-0,037 ***			-0,037 ***			-0,097 ***		
Father's employment status. Reference: Temporary employees	Non applicable	0,019 ***	0,028 ***	0,008 ***	0,020 ***	0,027 ***	0,011 ***	0,053 ***	0,047 ***	0,054 ***
	Employer	0,014 ***	0,017 ***	0,007 ***	0,015 ***	0,016 ***	0,012 ***	0,040 ***	0,028 ***	0,058 ***
	Self-employed	0,014 ***	0,015 ***	0,008 ***	0,015 ***	0,014 ***	0,014 ***	0,040 ***	0,023 ***	0,070 ***
	Permanent employees	0,016 ***	0,020 ***	0,008 ***	0,015 ***	0,018 ***	0,011 ***	0,038 ***	0,029 ***	0,048 ***
Mother's employment status. Reference: Temporary employees	Non applicable	0,023 ***	0,035 ***	0,008 ***	0,027 ***	0,038 ***	0,015 ***	0,081 ***	0,074 ***	0,080 ***
	Employer	0,009 ***	0,009 ***	0,005 ***	0,009 ***	0,008 ***	0,008 ***	0,023 ***	0,014 ***	0,040 ***
	Self-employed	0,008 ***	0,010 ***	0,004 ***	0,008 ***	0,009 ***	0,006 ***	0,020 ***	0,016 ***	0,027 ***
	Permanent employees	0,008 ***	0,010 ***	0,004 ***	0,008 ***	0,009 ***	0,006 ***	0,020 ***	0,015 ***	0,025 ***
	Inactive	0,006 ***	0,008 ***	0,003 ***	0,006 ***	0,007 ***	0,004 ***	0,014 ***	0,011 ***	0,018 ***
Siblings	Older	-0,014 ***	-0,014 ***	-0,010 ***	-0,014 ***	-0,012 ***	-0,013 ***	-0,033 ***	-0,019 ***	-0,058 ***
Reference: no siblings	Younger	-0,005 ***	-0,006 ***	-0,003 ***	-0,005 ***	-0,005 ***	-0,003 ***	-0,011 ***	-0,008 ***	-0,014 ***
Wealth	Wealth	0,017 ***	0,019 ***	0,010 ***	0,016 ***	0,017 ***	0,014 ***	0,040 ***	0,027 ***	0,058 ***
Reference: no items										
Semester of birth.	II semester	0,000	-0,001	0,001 **	0,000	-0,001	0,001 **	0,001	-0,001	0,006 **
Father's educational attainment level.	Primary	0,004 **	0,006 **	0,001	0,004 **	0,006 **	0,002	0,010 **	0,009 **	0,008
	Secondary	0,026 ***	0,034 ***	0,013 ***	0,025 ***	0,030 ***	0,017 ***	0,061 ***	0,048 ***	0,072 ***
Reference: Illiterate and without studies	Tertiary	0,031 ***	0,052 ***	0,006 ***	0,047 ***	0,068 ***	0,026 ***	0,175 ***	0,164 ***	0,175 ***
Mother's educational attainment level.	Primary	0,012 ***	0,014 ***	0,006 ***	0,012 ***	0,013 ***	0,009 ***	0,031 ***	0,022 ***	0,044 ***
	Secondary	0,044 ***	0,054 ***	0,025 ***	0,040 ***	0,046 ***	0,029 ***	0,093 ***	0,071 ***	0,118 ***
Reference: Illiterate and without studies	Tertiary	0,031 ***	0,055 ***	0,001	0,055 ***	0,079 ***	0,029 ***	0,225 ***	0,212 ***	0,226 ***
Municipality size.										
Reference 20.000 inhabitants or less	Over 20.000 inhabitants	0,008 ***	0,014 ***	0,002 ***	0,008 ***	0,012 ***	0,002 ***	0,018 ***	0,019 ***	0,010 ***

***, **, *: significant at 1%, 5% y 10% respectively.