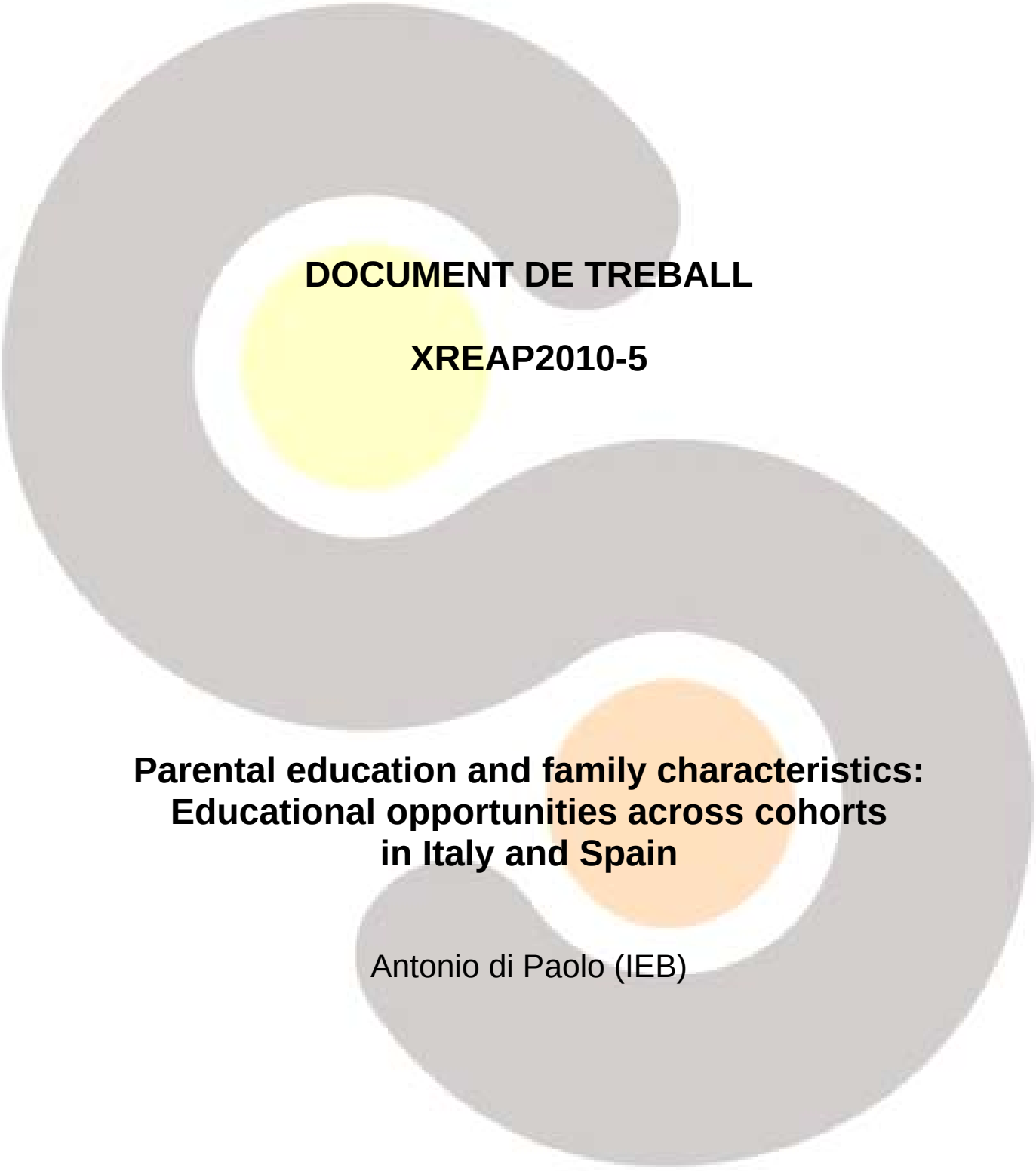

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Parental education and family characteristics: Educational opportunities across cohorts in Italy and Spain

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PARENTAL EDUCATION AND FAMILY CHARACTERISTICS: EDUCATIONAL OPPORTUNITIES ACROSS COHORTS IN ITALY AND SPAIN.

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Abstract

Drawing on data contained in the 2005 EU-SILC, this paper investigates the disparities in educational opportunities in Italy and Spain. Its main objective is to analyse the predicted probabilities of successfully completing upper-secondary and tertiary education for individuals with different parental backgrounds, and the changes in these probabilities across birth cohorts extending from 1940 to 1980. The results suggest that the disparities in tertiary education opportunities in Italy tend to increase over time. By contrast, the gap in educational opportunity in Spain shows a marked decrease across the cohorts. Moreover, by using an intuitive decomposition strategy, the paper shows that a large part of the educational gap between individuals of different backgrounds is "composed" of the difference in the endowment of family characteristics. Specifically, it seems that more highly educated parents are more able to endow their children with a better composition of family characteristics, which accounts for a significant proportion of the disparities in educational opportunity

Keywords: Educational Opportunity, Family Background, Birth cohorts, Italy, Spain

JEL Classifications: I21, J12, J62,

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1. Introduction

Over the last century, both Italy and Spain have experienced a significant expansion of their respective education systems; however, the educational performance of both countries has been particularly poor, especially in comparison with that of their Central and Northern European counterparts[1]. In fact, even though mean enrolment in post-compulsory education has increased considerably, the two countries record very high drop-out rates, in both secondary and University education. Moreover, data from the PISA survey (Programme for International Student Assessment) indicate that, with

1 See OECD (2008, 2009), Boarini (2009) and Fuentes (2009).

respect to test scores on Mathematics, Reading and Science, Italian and Spanish students are systematically among the worse in Europe.

However, underlying these issues of educational participation, quality and performance, the two countries suffer a general problem of equity in their educational systems. Specifically, several authors suggest that a student's educational opportunities are (still) strongly related to the educational background of their family, and as such this represents a clear violation of equality of opportunities (see, for example, Checchi *et al*. 2006, 2008, Peragine & Serlenga 2007, Triventi & Trivellato 2009, for Italy; Petrolongo & San Segundo 2002, Rahona-López 2009, Casquel & Uriel 2009, for Spain). Besides this educational underachievement, individuals from different social backgrounds are severely affected by a range of other problems in later life that are closely related to their educational attainment (labour status, poverty, health, etc.). Moreover, if this perverse mechanism of intergenerational inheritance of socio-economic status persists, these disparities run the risk of being perpetuated into the future generations.

A retrospective analysis can help to outline some of the main issues related to these potential inequalities in education. If we go back to the first half of the last century[2], we see that both Italy and Spain inherited a strong legacy from the elitist and highly stratified education systems of their respective Fascist regimes (Ballarino *et al.* 2009). However, during the second half of the century, both countries implemented similar, far-reaching education reforms. The general objective of these reforms was to guarantee equality of access and the opportunity to reach the highest levels of education, regardless of social origin and family background.

More specifically, the 1962 Educational Reform in Italy (*L. 31-12-1962, n. 1859*), and the 1970 General Education Act in Spain (*Ley General de Educación*, LGE), extended compulsory schooling until the age of 14 and eliminated track separation in lower secondary education (see Fort 2006 for details). Nevertheless, these two reforms, which typify the two educational systems throughout the period of analysis[3], were insufficient to guarantee equal post-compulsory education opportunities.

[2] Given that I consider individuals born between 1940 and 1980 (from the EU-SILC database; see below), this period coincides with the beginning of this paper's time span.

[3] In addition, for the Italian case, a further reform in 1969 (N.910 Act December 11, 1969) eliminated restrictions on access to university, allowing graduates from non-academic secondary schools to enrol. In Spain, the Organic General Act of the Educational System of 1990 (LOGSE) included, among other things, the further extension of compulsory (and comprehensive) education until the age of 16, postponing the introduction of track separation. However, the effect of this reform is not explicitly considered here; unfortunately, only individuals in the last cohorts are potentially affected by the reform, but many of them are excluded from the sample as they were still studying during the year the survey was conducted (2005).

In both countries there is, however, at least one institutional feature that might serve to account for the existence, or persistence, of educational disparities related to parental background. In fact, the two countries maintained a stratified structure of upper secondary education, with a key track separation at the age of 14. Basically, individuals (or their parents) can choose between academic (*Licei*), technical and professional (*Istituti Tecnici-Professionali*) secondary education in Italy, and between academic (*Bachillerato*) and vocational education (*Formación Profesional*) in Spain.

The empirical evidence suggests that this kind of early track separation could reinforce the existing link between family background and a child's final education attainment (see Hanushek & Wöβmann 2006, Brunello & Checchi 2007, Checchi & Flabbi 2007, among others). This effect is mainly produced by the impact of parental education background on the choice of educational curricula at the secondary school stage. The children of poorly educated parents tend to be overrepresented in non-academic secondary schools (irrespective of their ability), with marked (negative) consequences for the transition to University, and for the likelihood of obtaining a degree (Giuliano 2008). This issue can be particularly problematic in countries such as Italy or Spain, since a significant proportion of the "parents' generation" will have faced significant schooling constraints[4].

On the basis of these arguments, the first contribution of this paper is to analyse the potential disparities in upper secondary and tertiary education opportunities for individuals of different parental educational background[5]. More specifically, I shall examine the temporal evolution in post-compulsory educational opportunities in Italy and Spain, for individuals born between 1940 and 1980. I expect to find significant education gaps, especially as regards the possibility of being awarded a University degree. Additionally, the analysis of temporal changes (as in Checchi *et al*. 2008, and Heineck & Riphahn 2009) provides evidence regarding the potential persistence in educational (in)equality of opportunity, in response to institutional and social changes (i.e. the evolution in the labour market, educational system and social environment) in these two countries.

[4] In other words, many of the parents of the individuals observed in the data (population born between 1940 and 1980) may not have achieved the desired level of schooling because of the restrictions inherent to the elitist educational system(s) imposed by the Fascist regime(s). In all likelihood, school tracking would not be a "problem" for educational opportunities in a situation without a marked inequality of educational opportunities for the parents' generation.

[5] Parental education is considered the most powerful indicator of family background, and a "good" proxy of long-term parental income, as suggested by Cameron & Heckman (1998, 2001). See section 2 for the exact definition of parental education, as well as for those of the other variables used.

A further question of relevance involves investigating the "composition" of these educational disparities between individuals of different backgrounds, and how it evolves over time. In order to assess this issue, we need first to determine the reasons why children of better-educated parents obtain more and better schooling. An obvious candidate for explaining the educational gaps between individuals of different backgrounds is the intergenerational transmission of cognitive ability (see Behrman & Rosenzweig 2002, Sacerdote 2002, Plug & Vijverberg 2003).

However, Chuna *et al.* (2006) and Chuna & Heckman (2007) have suggested that genetic ability is comprised of (and not additively separable from) a larger set of elements than those with which better-educated parents are able to endow their children. These authors refer to the long-term parental income reflected by parental education, but also to non-cognitive skills such as motivation, time preferences, risk aversion and self-esteem, which are important determinants of socioeconomic success in later life.

Moreover, educational opportunities might also depend on home environment and other relevant family characteristics during childhood. Several contributions have sought to investigate the role played by family environment in a child's educational outcomes[6]; even though the causality of these effects remains unclear (i.e. Björklund *et al*., 2006, argue that family structure only impacts through unobserved family factors), some source of educational disparities might be associated with differences in family characteristics (other than parental education).

In fact, better-educated parents may provide their children with a better home environment, increasing their educational opportunities (Carneiro 2008). Moreover, the presence of educational assortative mating among parents (that is, parents tending to match according to their level of education) could additionally foster the disparities between individuals of different educational backgrounds. As a consequence, a component of the educational gap could be related to the additional role of parental schooling in the provision of a more stimulating home environment for the children's education[7].

[6] See, for example, the papers by Chevalier & Lanot (2002), Blanden (2004), Franzini & Raitano (2009) examining the effect of short-term family financial constraints; or the papers by Ermisch & Francesconi (2001a, 2001b), Gennatian (2005), Björklund *et al.* (2006) concerned with the effect of family structure and cohabitation on children's schooling.

[7] Moreover, better-educated parents also make better residential and school choices for their children, which could be another source of educational disparity. However, due to data limitations, I am unable to consider this issue explicitly here.

In short, the inequality in educational opportunity that can be observed in individuals of different backgrounds is broadly composed of two main effects of parental education: 1) a direct impact on a child's schooling generated by long-term factors, genetic transmission and other unobservable skills; and, 2) an indirect effect of parental education, produced through the improvement of other family characteristics that are relevant for a child's education. I propose a simple decomposition methodology for investigating this specific question, which should contribute evidence to further our understanding of the gap in educational opportunity and its documented persistence. The potential results from this analysis are of independent interest, providing information that should be useful for policymakers. In fact, to the extent to which educational disparities do not decline over time because of the persistent relationship between parental education and family characteristics, the departure from a situation of equality of opportunity in education could be even more pronounced.

With these purposes in mind, I will proceed as follows: the next section contains a description of the data used, providing also some descriptive evidence. In section 3, I present the empirical methodology. Section 4 reports the basic results about the temporal patterns of educational opportunity, and the decomposition of the direct and indirect effects of parental education. Finally, section 5 discusses the results and section 6 concludes.

2. Data and Descriptive Evidence

In this paper I draw on data from the 2005 wave of the "Survey on Income and Living Conditions" (EU-SILC). This particular wave of the EU-SILC survey is especially appropriate for analysing the link between educational opportunities and parental background, because it contains retrospective information about parental education and other family characteristics during childhood (specifically, when the individual was 14 years old). Additionally, the high number of observations in the Italian and in the Spanish samples[8] is very useful for investigating temporal patterns,

[8] The retrospective information of the intergenerational transmission of poverty module is reported only for individuals aged between 25 and 65 in 2005 (that is, individuals born between 1940 and 1980). Moreover, I retain only those observations i) for individuals who are not still studying in the year of the survey, ii) with valid information about completed education, iii) and about parental education for at least one parent, iv) and for individuals who are not living in an institution when 14. The final samples contain 30,493 observations for Italy and 17,889 observations for Spain.

because it enables the sample to be split into eight birth cohorts of five years each, extending from 1940 to 1980.

This allows a flexible strategy to be adopted for the analysis of temporal changes (described in the next section), supported by the fact that education can be considered unchanging before it is completed. Consequently, the evidence across cohorts can be taken as a temporal pattern, given that completed education (and its relationship with parental education) is not affected by the typical life-cycle bias considered in many intergenerational income transmission studies (see, for example, Nicoletti & Ermisch 2007, Lee & Solon 2009).

Information about educational attainment in the EU-SILC database is reported by ISCED levels (see UNESCO, 1997). However, in the empirical analysis, I group this information into four standard categorical levels of completed education, namely: 1) no-education or primary education, 2) lower-secondary education, 3) upper secondary education, 4) tertiary education. This definition applies for individual's education, but also for the highest level of education completed by his or her parents, which here represents the main measure of parental educational background.

In an attempt at supporting the relevance of this study, I present an intuitive descriptive picture of the educational gap associated with parental background, and its evolution across the eight birth cohorts between 1940 and 1980. Figure 1 contains, for both countries, the expected number of years of education[9] by birth cohort, for each level for the highest level of parental education completed. This figure shows an important and persistent schooling gap in both countries, where only individuals with at least one tertiary educated parent constantly achieve 15 or more years of education (on average). Moreover, it is also clear that children from the least-advantaged group (individuals whose parents have no-education or only primary education) are strongly penalized, even if their mean schooling attainment is increasing significantly over time.

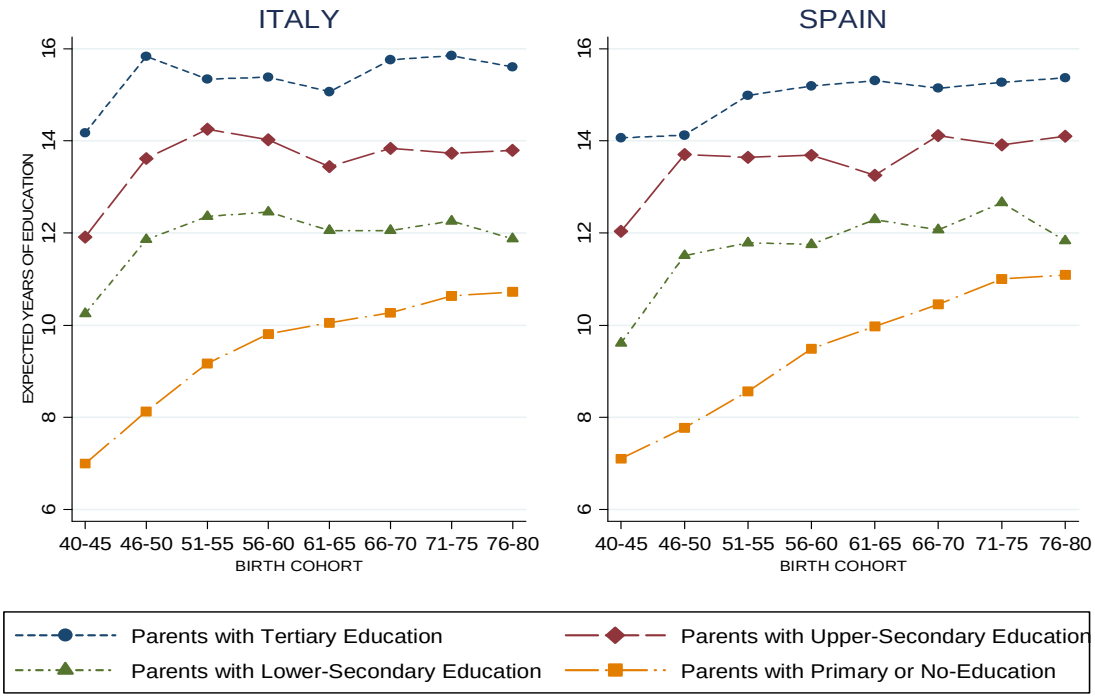
However, in order to obtain more detailed evidence regarding the disparities in educational opportunity, we need to investigate the chances of completing any given level of education, since educational certificates have a strong legal value in the two countries[10]. This means that any additional year of schooling not resulting in a higher grade has no value in the labour market, because it cannot be certified. Moreover, we

[9] The number of years of education are imputed from completed levels. Specifically, for Italy: 2 years for no-education, 5 for primary education, 8 for lower-secondary, 13 for upper-secondary and 18 for tertiary education. For Spain: 2 years for no-education, 6 for primary, 8 for lower-secondary, 12 for upper-secondary and 17 for tertiary education.

[10] This tends to provoke the ship-skin effect, which means that the students either obtain the certificate or drop-out as soon as they realise they have little chance of completing that educational grade (Checchi 2003).

need to consider the presence of covariates (i.e. family characteristics and any other relevant variable), given that the educational gap expressed by simple means might be exacerbated by the effect of other important determinants of educational attainment.

Figure 1: expected (imputed) years of education across birth cohorts by parental education



Therefore, with the information available in the EU-SILC database, I define a set of family characteristics (other than parental education), which are included in the empirical multivariate analysis; the details are contained in Table 2, together with some basic descriptive statistics for the two countries[11]. Apart from information concerning the highest level of education completed by one of the two parents, I also consider the impact of 1) the frequency of financial problems during childhood, 2) a set of variables representing family structure and cohabitation at the age of 14 (father absent/deceased, living with both parents, the number of siblings and young maternal age[12]), 3) parental

[11] I also include as individual controls three separate indicators for gender, having a chronic illness and foreign nationality, respectively. Note that, for sake of brevity, the analysis of the differences by gender is not considered in this paper. The empirical model also include indicators for observations with missing values of the explanatory variables, where the original variable are replaced with the mean value (by parental education and birth cohort) for continuous variables, and with a zero for dummy variables.

[12] The dummy for father absent/deceased would capture the possibility that the highest level of education of the parents was that reported by the mother simply because the father was absent or deceased, which is a relevant occurrence especially in the period post WWII for Italy, and post Civil War for Spain (that is, in the first two birth cohorts here). The definition of young motherhood varies across cohorts, in order to take into account temporal changes in fertility behaviour: I consider a case of young motherhood a situation where the mother was younger than 18 during the first 4 cohorts, younger than 20 between the fifth and the sixth (included), and younger than 23 for the last two cohorts.

working situation and parental socio-economic status (represented by the highest ISEI index in the family, see Ganzeboom *et al*. 1992).

Table 2A: variables, definitions and descriptive statistics

COUNTRY		**ITALY**		**SPAIN**			
VARIABLE	***DESCRIPTION***	***MEAN***	***S.D.***	***MEAN***	***S.D.***	***MAX***	***MIN***
Individual controls							
gender	*= 1 if male, 0 otherwise*	0.492	0.5	0.485	0.5	0	1
foreigner	*= 1 if foreigner, 0 otherwise*	0.054	0.227	0.057	0.231	0	1
chronic_illness	*= 1 if has a chronic illness, 0 otherwise*	0.171	0.376	0.205	0.404	0	1
Parental education							
h_tertiary	*= 1 if the highest completed education is tertiary*	0.669	0.471	0.795	0.404	0	1
h_upper_secondary	*= 1 if the highest education is upper-secondary*	0.176	0.381	0.059	0.236	0	1
h_lower_secondary	*= 1 if the highest education is lower-secondary*	0.122	0.327	0.061	0.239	0	1
h_primary_noeduc	*= 1 if the highest education is primary or no-education*	0.034	0.18	0.085	0.279	0	1
l_years_educ	*lowest parental education in years (imputed)*	5.019	2.859	5.101	2.921	2	18/17
Frequency of financial problems during childhood (subjective)							
usual	*= 1 if financial problems were usual*	0.19	0.393	0.125	0.331	0	1
frequent	*= 1 if financial problems were frequent*	0.227	0.419	0.112	0.315	0	1
occasional	*= 1 if financial problems were occasional*	0.281	0.45	0.206	0.404	0	1
rare	*= 1 if financial problems were rare*	0.17	0.376	0.191	0.393	0	1
absent	*= 1 if financial problems were absent*	0.131	0.337	0.361	0.48	0	1
Family structure and cohabitation							
no_father	*= 1 if the father was absent/deceased*	0.06	0.237	0.024	0.152	0	1
both_parents	*= 1 if the individual was living with both parents*	0.927	0.26	0.934	0.248	0	1
n_siblings	*number of siblings in the household*	2.163	1.962	2.822	2.125	0	20
young_mother	*= 1 if young mother*	0.092	0.289	0.057	0.231	0	1
Parental working situation and family socio-economic status							
father_not_working	*= 1 if the father was not working (unemployed/inactive)*	0.145	0.352	0.025	0.156	0	1
mother_not_working	*= 1 if the mother was not working*	0.023	0.151	0.012	0.11	0	1
mother_housewife	*= 1 if the mother was an housewife*	0.727	0.445	0.673	0.469	0	1
parental_ISEI	*highest parental socio-economic status index*	35.371	13.165	33.959	13.401	16	80
Indicators for missing information							
miss_parental_educ		—	—	0.021	0.144	0	1
miss_fin_probl		—	—	0.004	0.067	0	1
miss_n_siblings		—	—	0.006	0.077	0	1
miss_young_mother		0.289	0.453	0.103	0.303	0	1
miss_father_work		—	—	0.009	0.095	0	1
miss_mother_work		—	—	0.002	0.047	0	1
miss_par_ISEI		0.057	0.233	0.03	0.172	0	1

Source: EU-SILC 2005.

Moreover, in order to take into account the presence of parental educational assortative mating, I explicitly include information about 4) the lowest level of education attained by one of the two parents (in number of years of education, and applying the same conversion rule as above), which is treated as another family characteristic.

3. Empirical Strategy

As discussed above, the main objective of this paper is to explain the chances of achieving a given educational grade, for individuals of different parental educational background. With the information about education successfully completed categorized into four ordinal levels (no-education or primary, lower-secondary, upper-secondary and tertiary education), the most direct empirical specification consists in the ordered probit model, extensively used in the literature (see Cameron & Heckman 1998, Ermisch & Francesconi 2001a, Chevalier & Lanot 2002, Lauer 2003, Brunello & Checchi 2005, Heineck & Riphahn 2009, among many others).

Specifically, I define the educational opportunity for an individual of a particular educational background, who was born in a given cohort, as the predicted probability from the ordered probit (separately estimated for each birth cohort). However, in order to obtain a more compelling picture of the disparities by parental education, the predicted probabilities are computed by fixing the covariates (family characteristics) at the mean value for the individuals born in the same cohort, and with the same level of parental education.

Therefore, the predicted probability of completing level of education *j*, for an individual born in cohort *c*, with parental educational background (highest completed education by the parents) equal to *k*, is computed as:

$$\Pr\left[E=j \mid PE=k, \bar{Z}^{k,c}\right]_c = \Phi\left(\mu_{j,c} - \beta_{k,c} PE_k - \gamma_c \bar{Z}^{k,c}\right) - \Phi\left(\mu_{j-1,c} - \beta_{k,c} PE_k - \gamma_c \bar{Z}^{k,c}\right), \quad (1)$$

where Φ is the standard normal distribution and $\bar{Z}^{k,c}$ represents the vector of family characteristics, fixed at the mean value by parental education (*k*), for each birth cohort (*c*). The coefficients, estimated separately for each birth cohort (*c*), represent the cut-points ($\mu_{j,c}$), the coefficient associated with the parental education indicator ($PE_k = k$ if

parental education is equal to *k*), and the effect of family characteristics ($\bar{Z}^{k,c}$) on educational attainment (γ_c), respectively.

In this way, the predicted probabilities for each level of parental education and for each birth cohort can provide clear evidence as to the disparity in educational opportunity among individuals of different backgrounds, and the changes across the cohorts. Moreover, estimating the model separately for each birth cohort enables us to obtain a flexible representation of the temporal pattern of educational opportunities; in fact, this specification allows for changes in the parameters and changes in the composition of the sample over the eight birth cohorts.

As for the second objective of this paper, I seek to investigate the "composition" of the educational opportunities, as defined above. Namely, I wish to verify if an individual of a given background (i.e. parents with tertiary education) enjoys better educational opportunities than individuals from lower backgrounds, because of the direct effect of parental education, or because a high level of parental education is also associated with a better endowment of family characteristics — i.e. the indirect effect of parental education *via* family characteristics.

In order to do this, I suggest a simple decomposition strategy based on the pioneer Oaxaca-Blinder method (Blinder 1973, Oaxaca 1973), which is also in line with the methodology used in Bourguignon *et al.* (2007), for investigating the inequality of the opportunity component of income inequality in Brazil[13]. Specifically, I consider the counterfactual predicted probabilities, computed by replacing the mean endowment of family characteristics from the least-advantaged group (families whose parents have no-education or only primary education).

These counterfactual predicted probabilities represent the (hypothetical) educational opportunity for an individual with a given educational background (more than primary education), if he/she had been endowed with the same family characteristics as those presented by the least-advantaged group[14]. The counterfactual predicted probabilities are computed as

$$\Pr\left[E=j \mid PE=k, \bar{Z}^{1,c}\right]_c^* = \Phi\left(\mu_{j,c} - \beta_{k,c} PE_k - \gamma_c \bar{Z}^{1,c}\right) - \Phi\left(\mu_{j-1,c} - \beta_{k,c} PE_k - \gamma_c \bar{Z}^{1,c}\right), \quad (2)$$

[13] The authors separate the component of income inequality due to "effort" from the components due to the direct effect of "circumstances" into income inequality, and the indirect effect through the impact of these circumstances on effort. Unfortunately, I cannot directly assess the question of inequality of opportunities (that is, dividing a given outcome into "effort" and "circumstances" components), because of the lack of "effort" variables for educational attainments in the EU-SILC database.

[14] Note that the returns to family characteristics are assumed to be the same for every level of parental education; therefore, the reader must consider that what I define as the direct effect of parental education, that this variable might also include some effect of parental education in altering the coefficients (the returns) to family characteristics.

that is, replacing $\bar{Z}^{k,c}$ for $\bar{Z}^{1,c}$ (the mean endowment of family characteristics when parental education is equal to 1), for every level of parental education higher than 1 (*k = 2,3,4*), and for every birth cohort *c*.

Additionally, once the counterfactual predicted probabilities have been obtained, it is possible to explicitly compute the indirect effect of parental education on educational opportunity (through the composition of the family's characteristics), and its changes across birth cohorts. The difference between the baseline and the counterfactual probability,

$$\Delta \Pr\left[E = j \mid PE = k\right]_c = \Pr\left[E = j \mid PE = k, \bar{Z}^{k,c}\right]_c - \Pr\left[E = j \mid PE = k, \bar{Z}^{1,c}\right]_c^*, \quad (3)$$

represents the change in the likelihood of achieving an educational level equal to *j*, associated with the switch in family characteristics from the endowment of families with parental education equal to 1, to the mean endowment of families with parental education equal to *k*.

Let us consider that the counterfactual probabilities are computed with respect to the endowment of family characteristics of the least-advantaged group (in terms of parental education). Therefore, the difference between the baseline and the counterfactual probability represents the changes in educational opportunity in response to the better composition of family characteristics of families with higher levels of parental education. In other words, $\Delta\Pr[\cdot]$ indicates the indirect effect of parental education on educational opportunity through its relationship with family characteristics.

4. Estimation Results

The estimation results from the ordered probit models for completed education[15] are reported in Tables 3a and 3b (in the Appendix). Before proceeding with the analysis of the predicted probabilities, I briefly describe the coefficient estimates and their changes over the eight birth cohorts for Italy and Spain. The first significant result is that, in both countries, males obtained more schooling than females in the first four cohorts; however, this gender gap was visibly reversed in the last four cohorts.

[15] One may argue that these results are biased by the effect of (intergenerational transmission of) unobserved cognitive ability; however, if we can assume that genetic transmission is constant over time, the analysis of temporal changes is still valid, at least in a descriptive sense (that is, not in causal terms).

As expected, parental educational background (the highest completed grade by one of the two parents) represents the most important determinant of an individual's education; its effect tends to decrease over time only in the case of Spain. In addition, the effect of the lowest level of education (in years of schooling) attained by one of the two parents is also positive and statistically significant in all the cohorts (although not decreasing), highlighting the importance of parental educational assortative mating. An increase in the frequency of financial problems during childhood has a strong negative impact on schooling in the two countries; however, the associated coefficients decline over time in the case of Spain, but not in that of Italy.

The only (observed) feature of cohabitation and family structure which seems to have a clearly significant effect on educational attainment is the number of siblings. In general, the negative effect of an increase in the number of siblings tends to increase across the cohorts for both Italy and Spain. Furthermore, a young maternal age clearly represents a penalization for educational attainments for the latter cohorts.

Parental working status does not significantly affect educational attainment, apart from the positive (and unexpected) effect of having a housewife mother, which was statistically significant in some birth cohorts. By contrast, a family's socio-economic status (represented by the highest ISEI in the family) is a strong predictor of educational attainments, showing an effect that tends to decrease over time.

Finally, the behaviour of the estimated cut-points indicates that there is a strong temporal contraction in the probability mass of the first category of the dependent variable — i.e. a reduction in the probability of having no-education or only primary education (*ceteris paribus*), in response to the compulsory school reforms implemented in the two countries[16]. Moreover, the shift towards the left of the last cut-point in both countries suggests a general expansion of tertiary education. However, this expansion in the likelihood of completing University successfully might not have been the same for individuals of different backgrounds (as shown by the following results).

[16] Note that an important shift is recorded in the first cut-point between the second and the third cohorts in Italy and between the fourth and the fifth cohorts in Spain, which correspond, respectively, to the first cohorts potentially affected by the educational reforms discussed earlier.

4.1 Predicted Probabilities

The following step involves examining the predicted probabilities (the measure of educational opportunity) by parental education and for each birth cohort. For the sake of brevity, I only explicitly consider the predicted probabilities of achieving post-compulsory education (that is, upper-secondary or tertiary education)[17]. The (factual) predicted probabilities and the 90% confidence intervals (discontinuous lines) are shown in Figures 2a and 2b for Italy and Spain, respectively. For each level of parental education (PE), the line with triangular markers represents the probability of being awarded a University degree and the line with square markers corresponds to the probability of completing upper-secondary education.

In Italy, the likelihood of completing upper-secondary education clearly increases across the cohorts. Moreover, upper-secondary educational opportunities for individuals of different backgrounds tend to converge at the same level, except in the case of the children of tertiary-educated parents, who are consistently one step further towards tertiary education. By contrast, the picture for tertiary education opportunity is quite distinct; in fact, only individuals from families with the highest educational backgrounds display a persistently higher chance (but also the greatest dispersion) of completing their tertiary studies.

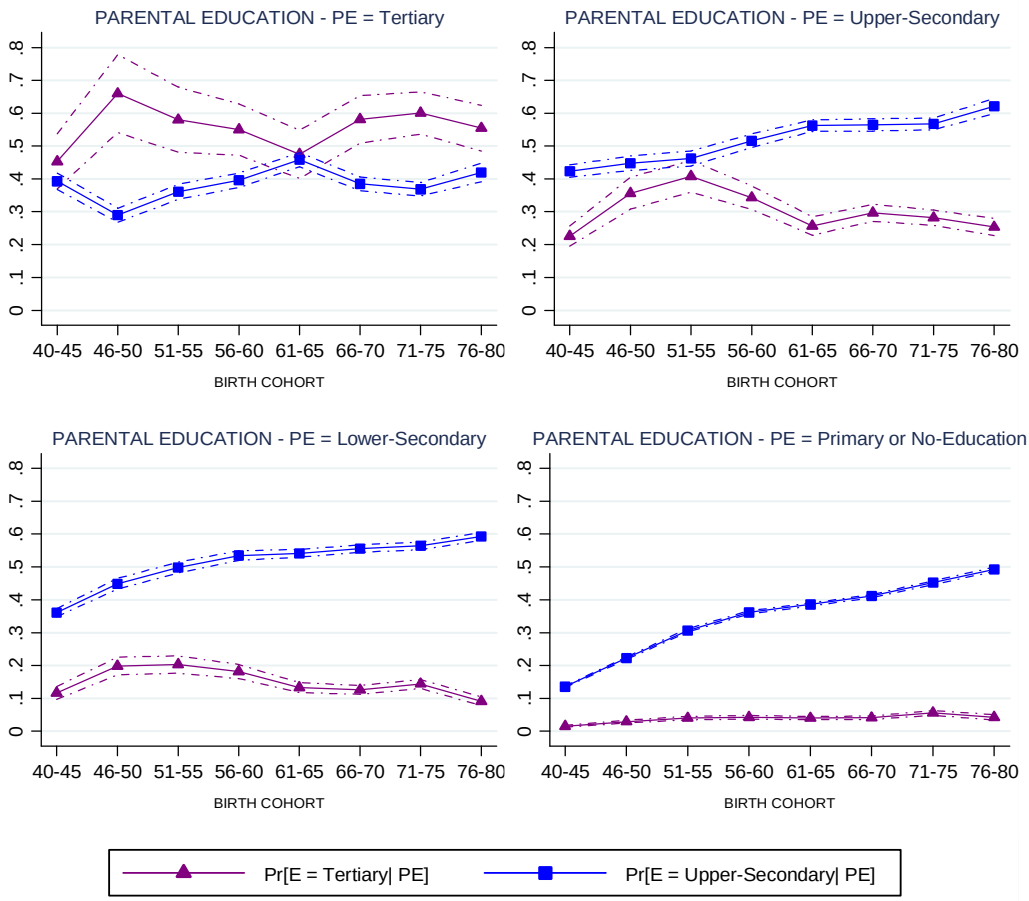
The temporal pattern indicates that the probabilities of obtaining a University degree were greatest during the first cohorts. This, in all likelihood, reflected the effects in Italy of the 1962 educational reform, further enhanced by the effects of the subsequent 1969 reform which opened up university entrance to students from non-academic schools. However, for the children of secondary-educated parents, this probability fell during subsequent cohorts, increasing the disparities in opportunity for tertiary education. Moreover, for individuals from the lowest backgrounds, the likelihood of achieving tertiary education remained consistently low over the entire period.

In general, only the children of tertiary-educated parents presented greater chances of completing tertiary education, which means that they are the only ones to really benefit from the expansion of tertiary education. In fact, the individuals of a

[17] The results (not shown here) indicate that the predicted probability of having only primary education approaches the value of zero very quickly in both countries. Moreover, the probability of leaving the educational system with only lower-secondary education are almost stable over time for the two countries, and higher than 0.3% only for individuals with the lowest level of parental education. Even so, this "typology of individual" is likely to disappear with time, when the effect of the compulsory-school reforms has an impact on the whole of the parent generation.

lower background are always more likely to terminate their schooling in upper-secondary school than with a University degree.

Figure 2a: Predicted Probabilities — Italy



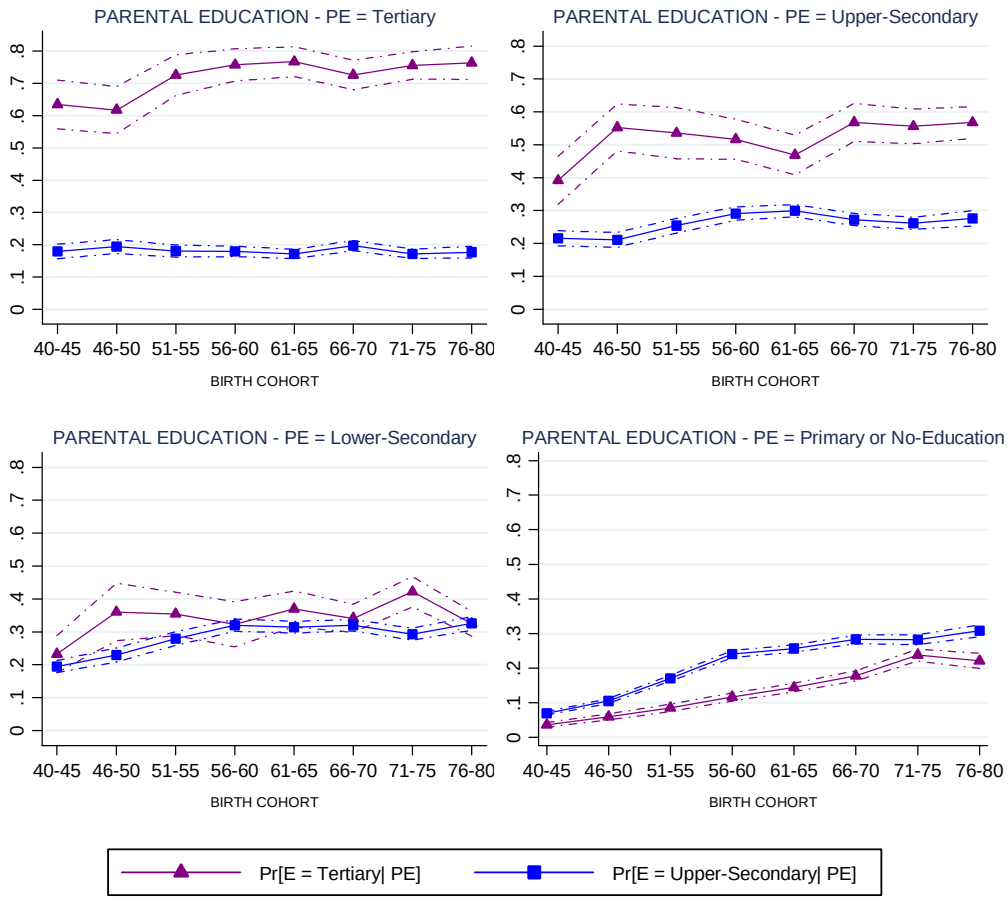
The evidence for Spain differs considerably; in fact, the probability of obtaining an upper-secondary education remains virtually unchanged over time, showing a moderately rising tendency only in the case of individuals from lower-secondary educated families or less. Nevertheless, the disparities in upper-secondary education opportunities tend to disappear over the course of time in Spain as well.

As for tertiary education opportunity, the results for Spain suggest a marked improvement, given the general increase in predicted probabilities. Nevertheless, the chances of being awarded a University degree are visibly higher among the children of tertiary-educated parents, while they are markedly lower among the children of primary or uneducated parents[18]. This picture suggests that the disparities in tertiary education

[18] Note also that, in the case of Spain, the dispersion of tertiary education opportunities (which can be taken as a broad measure of within-group inequality) is higher for individuals with upper-secondary and (to a lesser extent) lower-secondary educated parents. Moreover, in the Spanish case, the predicted probabilities do not show any visible effect of the 1970 educational reform (implemented in 1974), which should have affected individuals born before 1960.

opportunities have clearly diminished over time, but that (to some extent) they still persist for the youngest cohorts (at least up to the end of the period analysed here).

Figure 2b: Predicted Probabilities — Spain



However, the situation is less complicated than in the case of Italy, given that the chances of completing University successfully are always higher than the chances of curtailing ones' education on termination of upper-secondary school (excluding, that is, individuals from the least-advantaged group). In general, this means that in Spain, individuals from a lower background have also benefited from the expansion of tertiary education, albeit not to the same extent as individuals from higher backgrounds.

4.2 Counterfactual Predicted Probabilities

In addition to an analysis of post-compulsory educational opportunities across the birth cohorts, understanding the "composition" of these predicted probabilities for individuals of different family educational backgrounds would be extremely useful when designing educational policies. In fact, as commented above, the disparities in

educational opportunity that we observe might include a direct effect of parental education (namely, long-term income, genetic and non-cognitive skills bequests, etc.); but also an indirect effect that parental education could exert on the endowment of the other family characteristics (that affect children's educational attainments).

In order to assess the extent to which educational opportunities are made up of this potential indirect effect, I compute the counterfactual predicted probabilities described previously. Figures 3a and 3b show the hypothetical educational opportunities obtained by replacing the mean family characteristics' endowment (the vector $\bar{Z}^{k,c}$), with the mean values from the least-advantaged families[19] (highest parental education equal to 1), that is $\bar{Z}^{1,c}$.

For each figure, the upper panel represents the predicted probabilities (factual and counterfactual) of achieving tertiary education, whereas the lower panel illustrates the probabilities of obtaining upper-secondary education. With a simple graphical analysis, we notice that once differences in the endowment of family characteristics have been accounted for, individuals from different educational backgrounds have very similar educational opportunities.

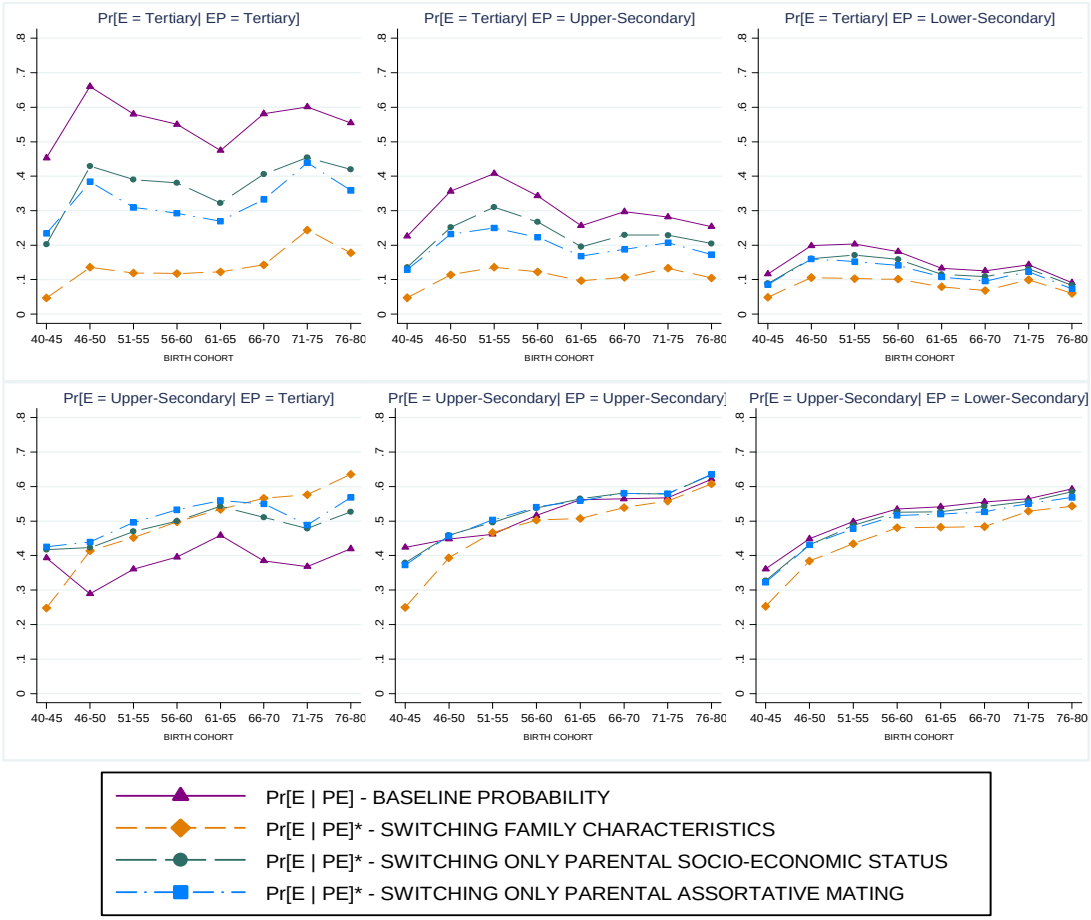
Specifically, for both countries, there is almost no effect of the differences in the composition of a family's characteristics on the chances of obtaining upper-secondary education. The only noticeable effect is on the children of tertiary-educated parents, whose "better" endowment of family characteristics makes them less likely to drop out after upper-secondary education than others (that is, the counterfactual predicted probabilities are higher than the factual).

Moreover, when accounting for their better family environment, individuals of tertiary-educated parents present almost the same likelihood of completing upper-secondary education as those of a lower educational background. By contrast, the chances of successfully completing tertiary education are significantly lower when the mean family characteristics are switched to the values of those from the least-advantaged group (lines with diamond markers). In addition, the disparities between individuals of different backgrounds undergo a marked reduction[20] in both countries.

[19] The reader should bear in mind that this decomposition may be affected by path-dependency, which means that the results could be sensitive to the choice of the reference group (here, individuals from primary or uneducated parents); however, using as our reference group individuals from tertiary educated parents does not modify the general results. Bear in mind also that control variables are kept fixed to the actual mean values.

[20] Obviously, here again I do not report the predicted probabilities for individuals from primary or uneducated parents, given that this group is taken as a reference in the decomposition.

Figure 3a: Counterfactual Predicted Probabilities — Italy



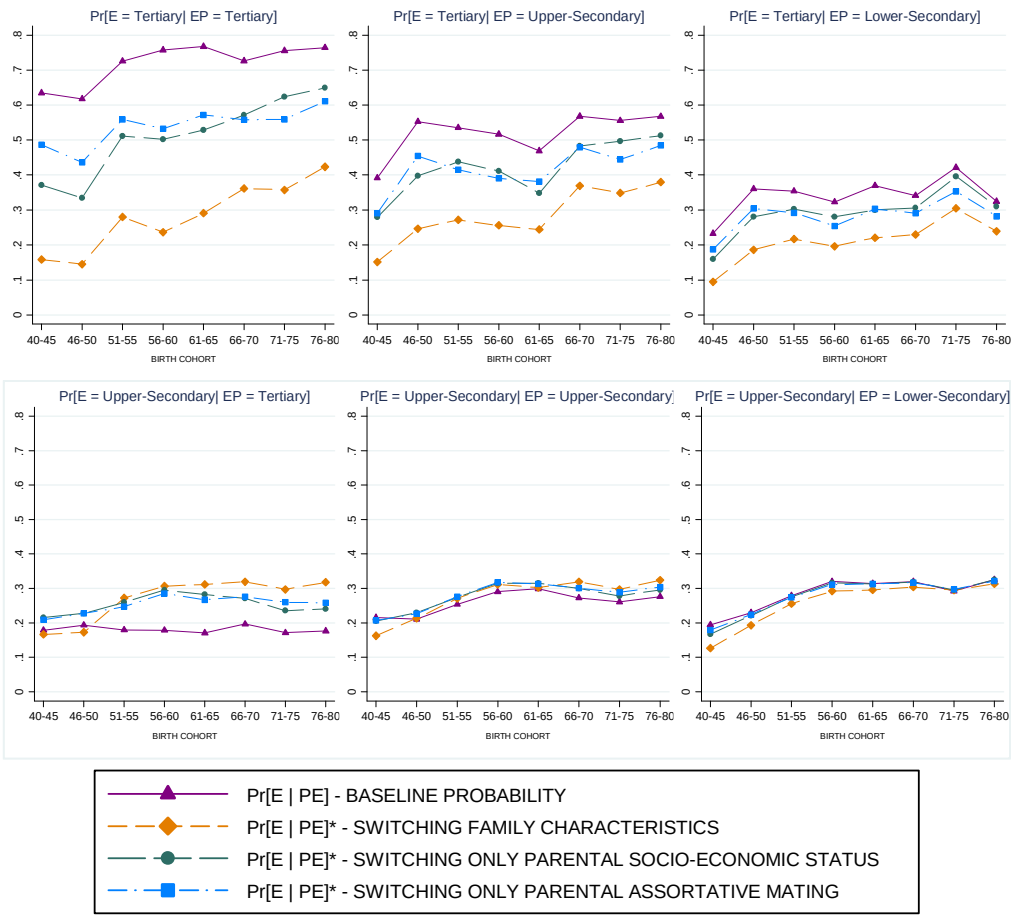
It is interesting to analyse the relevance of individual elements making up the family characteristics. In Figures 3a and 3b, I report the two most relevant of these. Specifically, I compute additional counterfactual probabilities, switching only parental socio-economic status (lines with circled markers) and parental educational assortative mating[21] (lines with square markers), respectively.

It seems that in Italy, the statistical association between parents' educational level accounts for a greater proportion of educational opportunities than the socio-economic status of the family. In fact, the shift in the predicted probabilities is more pronounced when switching the lowest level of education (in years) than it is when switching the parental socio-economic status index. By contrast, in Spain, a family's socio-economic status and parental assortative mating account for almost the same proportion of tertiary education opportunities, with the exception of children of tertiary-educated parents. In fact, for the latter, family's socio-economic status is more important for educational

[21] I replace the (mean) lowest level of education completed by the parents to the mean value for individuals with primary or uneducated parents. This captures the statistical association between parents' education, which represents the degree of parental assortative mating according to education.

opportunities than parental assortative mating for the first five cohorts, and less important for the last three.

Figure 3b: Counterfactual Predicted Probabilities — Spain



Yet, in both countries, these two elements have a significant impact on educational opportunities over the entire period, and account for the greater part of the effect of family characteristics on educational opportunities. In order to fully appreciate the size of this indirect effect of parental education and how it evolves across the cohorts, Figure 4 illustrates the difference between the factual and the counterfactual predicted probabilities ($\Delta Pr[\cdot]$) of successfully completing tertiary education[22].

As expected, the indirect effect of parental education, through its relationship with the endowment of family characteristics, increases with completed parental education, because higher parental education has an increasingly positive effect on the distribution of family characteristics (on average). In general, the global effect (represented by the

[22] Notice that only $\Delta Pr[\cdot]$ for achieving tertiary education is considered, because, as previously commented, the indirect effect on obtaining upper-secondary education is negligible.

lines with triangular markers) obtained by switching the overall set of family characteristics shows a decreasing tendency across the cohorts for the two countries[23].

However, in the case of Italians of secondary-educated parents, this decline starts only in the third cohort. In the case of the Spaniards, the decline is more homogeneous, with the exception of individuals with tertiary-educated parents; in fact, for these individuals the indirect effect of parental education shows a moderate increase between the third and the fourth cohorts, but it decreases after that.

In Figure 4, I also consider the impact on educational opportunity of the association between the highest grade of parental education with family socio-economic status, the lowest level of parental education (parental assortative mating), and the rest of family characteristics (diamond, circle and square lines) respectively. It is possible to note that in Italy, the indirect effect through the socio-economic channel shows a markedly declining tendency. Nevertheless, the effect of parental educational assortative mating gains some (relative) importance over the course of time.

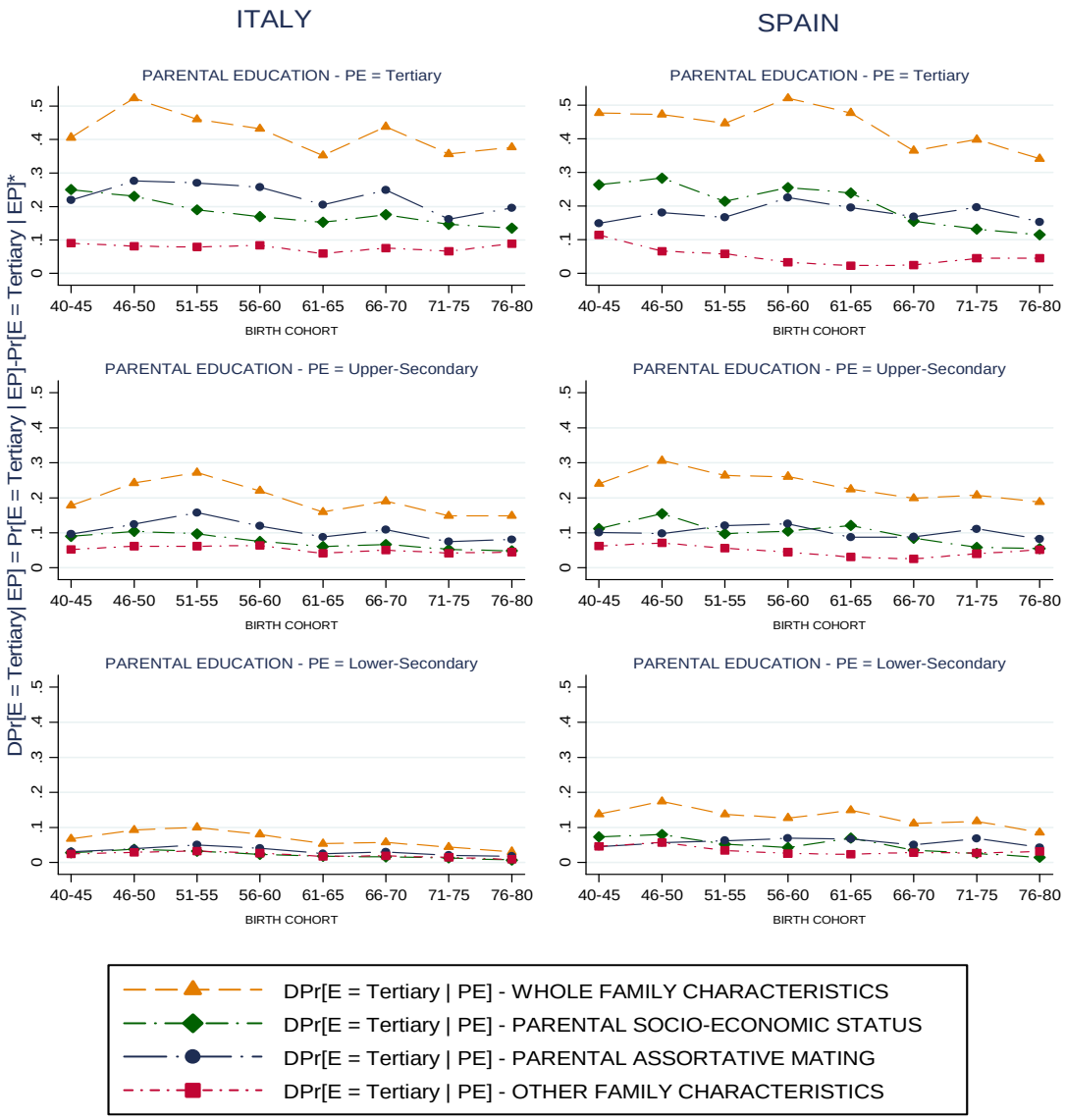
In Spain, as discussed above, the socio-economic status and the parental assortative mating components present almost the same importance for individuals with upper-secondary and lower-secondary educated parents. Interestingly, for individuals from the highest educational backgrounds (at least one parent with tertiary education), during the first three cohorts the effect of socio-economic status tends to fall, and the effect of assortative mating tends to rise; however, the latter exceeds the former only from the sixth cohort on.

Moreover, in both countries, the effect of the rest of the family characteristics is, in general, less marked[24]; it also seems to be virtually stable for Italy, while displaying a moderate tendency to fall in Spain.

[23] The decline in the indirect effect of parental education might also be caused by a generalized improvement in family characteristics, thanks to economic growth and development. However, if this shift in the cohort-composition of family characteristics affects families of different educational backgrounds in the same way, the analysis of temporal changes is still valid (in a descriptive sense).

[24] The effect of the rest of family characteristics would be mainly attributable to the impact of the number of siblings and the impact of financial problems during childhood. Note that this could mean that short-term financial constraints are not a real problem for educational opportunity (given that parental education is highly correlated with this variable). However, this variable represents "subjective financial well-being", and its subjective nature could explain the relatively low impact on educational opportunity (apart from other potential "recall" problems).

Figure 4: Indirect Effects of Parental Education on Family Characteristics



5. Discussion

The large number of results reported above makes several contributions to the existing evidence regarding educational opportunities in Italy and Spain. First of all, the results for upper-secondary education opportunities appear to show that individuals of different educational backgrounds have, over the course of time, attained almost the same chances of successfully completing upper-secondary education. In fact, both countries display a tendency towards the equalization of the predicted probability of completing upper-secondary education (with the exception of individuals with at least

one tertiary-educated parent, who consistently go one step further into tertiary education).

However, the definition of upper-secondary education might hide major disparities in relation to family background, given the differences in the educational curricula. In fact, the definition of upper-secondary education (taken from the ISCED) does not differentiate between academic and non-academic secondary tracks. This means that, even though it might seem that individuals of different backgrounds record the same predicted probability, those with a more unfavourable educational background might be more likely to enrol in non-academic schools (irrespective of their ability). This represents an additional source of educational disparity, which, unfortunately, it is not possible to capture with the EU-SILC data.

The effects of this disparity in secondary education track choices probably results in a reduction in the chances of successfully graduating from University, given the lower levels of quality and prestige traditionally attached to non-academic schools. Note that this problem might be considerably more pronounced in Italy than in Spain, since the track separation in the former is much more marked than in the latter. In general, in Spain, vocational secondary school was historically associated with school failure cases. Meanwhile, the general schooling process consists in proceeding with academic secondary education.

The evidence for tertiary education opportunities is, in general, consistent with this possibility, and as such presumably represents the other side of the same coin. In fact, while disparities in the chances of obtaining a University degree have significantly diminished across the cohorts in Spain, the evidence for the Italian case is quite distinct; in Italy, the difference in the likelihood of successfully completing tertiary education among individuals of different backgrounds has tended to increase over time. Moreover, in Italy, only the children of tertiary-educated parents are more likely to complete tertiary education than upper-secondary education; for individuals of a lower background, the evidence is just the reverse. By contrast, in Spain, the chances of obtaining a University degree are always higher than the probability of terminating one's schooling with (only) an upper-secondary education (excluding individuals of the lowest backgrounds).

A potential explanation for this divergence in the results between the two countries might lie in the stable effect of parental education on a child's educational achievements in Italy. This persistent relationship between parental education and a

child's schooling (reported in the previous estimations), together with the strong early track separation in post-compulsory secondary schools, might help explain why in Italy the inequality in tertiary education opportunities has tended to rise over time, and why this has not been the case in Spain. However, other possible explanations might lie in the labour market and in the supply side of education (i.e. different returns to education, differences in educational quality, etc.), or in systematic differences in individual/family behaviour related to educational choices (for example, with respect to the role of risk aversion, as in Checchi *et al.* 2008, Belzil & Leonardi 2007).

In addition, the results from the decomposition of the predicted probabilities suggest that individuals with a more favourable educational background obtain higher tertiary education opportunities, as well as because of their better endowment of family characteristics (with respect to individuals of the lowest background). In other words, higher parental education yields better tertiary education opportunity for their children, because it enables them to generate a more stimulating family environment. When accounting for differences in family characteristics associated with parental education, children from tertiary-educated parents (who display the highest tertiary education opportunity) are more prone to stop at upper-secondary school; moreover, the disparities in the chances of obtaining a University degree are significantly reduced.

This indirect effect of parental background on a child's educational chances represents an additional source of disparities in educational opportunity that must be taken into account by the policymaker. In fact, even if the impact of the differences in the mean endowment of family characteristics tends (in general) to decline across the cohorts, it does not completely disappear, thereby explaining part of the persistence of the educational gap.

Specifically, the results reported here indicate that the most important components of a family's characteristics are the family's socio-economic status and parental educational assortative mating. Thus, more highly educated parents increase the educational opportunity of their children, because their educational achievements enable them to generate a higher socio-economic status in the family. Indeed, the effect of a family's socio-economic status during the childhood on an individuals' educational opportunity might reflect long-term elements related to parental occupation, but also other factors related to parental social networking. However, another potential explanation for these results could be that parents who have achieved a high socio-economic status thanks to their schooling might be more capable of shaping their

children's educational opportunity because of the transmission of non-cognitive skills (such as motivation and persistence), but also by providing a better perception of the global value of schooling, and creating the right incentives to stay in education.

Moreover, parents tend to show a strong educational assortative mating pattern, which strengthens the educational disparities associated with parental background. In fact, highly educated parents are not only able to provide a better family socio-economic status, but they are also more able to find a better partner for enhancing their children's education, fostering the benefits to be reaped from a good family environment. However, the contrary is also true, given that poorly-educated parents are likely to match among them, increasing the detrimental effect of a low background on their children's educational opportunity.

Finally, it should be borne in mind that unobserved parental characteristics, related to parental education, might simultaneously affect a child's educational opportunity and the endowment of family characteristics. Therefore, to some extent, the indirect effect of parental education on educational opportunity might also include such unobservable effects. Nevertheless, assessing this issue in causal terms requires more detailed data, and represents an interesting subject for future research (once additional data become available).

6. Conclusions

This paper provides an analysis of post-compulsory educational opportunities in Italy and Spain, and their respective evolutions across birth cohorts for those born between 1940 and 1980. The results indicate that individuals of different educational backgrounds have, over the course of time, attained the same chances of successfully completing upper-secondary education. This evidence may (apparently) be interpreted as the equalization of opportunity in secondary education for individuals of different origin. However, as discussed above, the results may conceal significant disparities related to the choice of educational curricula in academic and non-academic secondary schools.

Additionally, this analysis confirms the conclusions reported elsewhere to the effect that the expansion of tertiary education has had a disproportionate advantage for individuals from a higher educational background, who are the only ones who

consistently present the best chances of completing University education. This situation is significantly more complex in Italy, where the disparity in opportunities in tertiary education among individuals from different backgrounds seems set to increase over time. However, in the Spanish case, the gap in the predicted probability of obtaining a University degree clearly tends to decrease over time, even if significant disparities are also present in the youngest cohorts.

Moreover, the results obtained from the decomposition of educational opportunities seem to indicate that a sizeable part of the disparity in the chances of completing a University degree is explained by differences in the endowment of family characteristics. More specifically, the results suggest that the children of better-educated parents are, to some extent, more likely to complete tertiary education, because the higher education of their parents provides the children with a better family environment for their schooling. Among the various family characteristics considered, a family's socio-economic status and parental educational assortative mating are, in both countries, the most relevant factors accounting for the gap in educational opportunity as regards a family's educational background.

The difference in the endowment of family characteristics provides an additional, potential explanation of the persistence in educational disparities based on social origins. Thus, even if the family characteristic channel cannot be entirely separated from other potential explanations (i.e. the effect of unobservable parental characteristics, or other factors related to secondary school choices), it needs to be taken into consideration by policymakers. The main recommendation here involves focusing educational policies so as to reduce the impact of family background on post-compulsory education opportunities.

The first alternative would involve creating school support programs for students from poor educational backgrounds, especially as regards their educational choices. However, the most effective policy would involve institutional changes in the educational system itself, promoting early schooling; extending compulsory education; postponing the tracking decision by implementing a comprehensive secondary school system.

Note that in Spain the educational system has already moved in this direction. With the implementation of the Organic General Act of the Educational System (LOGSE) of 1990, the country took two important steps towards the *destratification* of education. In fact, this act introduced a general system of compulsory education up to

the age of 16 (primary and lower-secondary education), delaying track separation by an additional two years. In all likelihood, more recent data would reflect this institutional change, showing a further reduction in educational disparities associated with family background.

By contrast, in Italy (where the stratifications would appear to be much stronger) the extension of compulsory education to the age of 16 was only recently implemented (with the Financial Law of 2007), but the track separation between academic, professional and technical upper-secondary education remains. The current political debate is concerned, among other things, with the possibility of reducing the number of educational programs; or switching towards a comprehensive system of upper-secondary education, which (as frequently suggested) represents the most effective strategy for equalizing educational opportunities.

Moreover, as regards tertiary education, a number of authors claim that the introduction of the "Bologna System" represents a crucial opportunity for equalising opportunities for higher education, especially among the more able students from unfavourable family backgrounds (Cappellari & Lucifora 2009). In fact, this reform might serve to reduce the disparity in tertiary education opportunities. This seems possible because the reduction in the duration of tertiary studies and in the number of examinations should reduce University opportunity costs, relaxing the negative effect of credit constraints on more able individuals. Since the Bologna Reform has still not been fully implemented in Spain, and the data for Italy are only available for the first cohort of individuals educated according to this new system, we need to wait for the availability of fresh data before considering the long-term effects of reform on tertiary education opportunities.

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Appendix

Table 3a: Ordered Probit for Completed Education — Italy (Robust Standard Errors in Parenthesis)

VARIABLE	1940-1945	1946-1950	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1980
gender	0.428***	0.392***	0.207***	0.114***	-0.011	-0.140***	-0.180***	-0.267***
	(0.036)	*(0.037)*	*(0.037)*	*(0.036)*	*(0.034)*	*(0.035)*	*(0.036)*	*(0.047)*
foreigner	0.270**	0.299**	-0.067	0.054	0.000	-0.039	-0.252***	-0.351***
	(0.123)	*(0.133)*	*(0.133)*	*(0.087)*	*(0.076)*	*(0.065)*	*(0.072)*	*(0.089)*
chronic_illness	-0.104***	-0.084**	-0.167***	-0.080	-0.283***	-0.209***	-0.298***	-0.279***
	(0.039)	*(0.043)*	*(0.046)*	*(0.049)*	*(0.050)*	*(0.060)*	*(0.071)*	*(0.095)*
h_tertiary	0.478***	0.781***	0.566***	0.534***	0.583***	0.678***	0.886***	0.764***
	(0.150)	*(0.221)*	*(0.172)*	*(0.153)*	*(0.135)*	*(0.144)*	*(0.136)*	*(0.159)*
h_upper_secondary	0.517***	0.681***	0.656***	0.560***	0.448***	0.489***	0.474***	0.447***
	(0.074)	*(0.097)*	*(0.091)*	*(0.075)*	*(0.071)*	*(0.067)*	*(0.064)*	*(0.086)*
h_lower_secondary	0.506***	0.621***	0.488***	0.442***	0.346***	0.247***	0.299***	0.151**
	(0.063)	*(0.063)*	*(0.062)*	*(0.055)*	*(0.048)*	*(0.046)*	*(0.044)*	*(0.062)*
h_primary_noeduc	*Reference Category*							
l_years_educ	0.099***	0.086***	0.103***	0.088***	0.072***	0.080***	0.051***	0.058***
	(0.010)	*(0.011)*	*(0.011)*	*(0.010)*	*(0.009)*	*(0.009)*	*(0.009)*	*(0.011)*
usual	-0.386***	-0.389***	-0.435***	-0.458***	-0.231***	-0.347***	-0.345***	-0.519***
	(0.072)	*(0.078)*	*(0.074)*	*(0.075)*	*(0.066)*	*(0.067)*	*(0.072)*	*(0.102)*
frequent	-0.340***	-0.285***	-0.355***	-0.308***	-0.223***	-0.275***	-0.135**	-0.415***
	(0.072)	*(0.075)*	*(0.070)*	*(0.069)*	*(0.060)*	*(0.061)*	*(0.062)*	*(0.085)*
occasional	-0.220***	-0.193***	-0.230***	-0.130**	-0.109*	-0.147***	-0.103*	-0.288***
	(0.071)	*(0.075)*	*(0.069)*	*(0.066)*	*(0.056)*	*(0.054)*	*(0.053)*	*(0.072)*
rare	-0.077	-0.027	-0.120	-0.118	-0.073	-0.079	0.061	-0.237***
	(0.077)	*(0.081)*	*(0.076)*	*(0.072)*	*(0.062)*	*(0.060)*	*(0.057)*	*(0.075)*
absent	*Reference Category*							
no_father	0.061	0.184	0.079	0.118	-0.079	-0.135	0.237	0.072
	(0.153)	*(0.174)*	*(0.167)*	*(0.188)*	*(0.150)*	*(0.175)*	*(0.206)*	*(0.250)*
both_parents	0.037	0.028	0.100	0.105	0.148	0.077	0.362*	0.237
	(0.141)	*(0.159)*	*(0.155)*	*(0.175)*	*(0.133)*	*(0.161)*	*(0.191)*	*(0.233)*
n_siblings	-0.083***	-0.079***	-0.080***	-0.095***	-0.105***	-0.104***	-0.104***	-0.075***
	(0.010)	*(0.011)*	*(0.010)*	*(0.009)*	*(0.010)*	*(0.010)*	*(0.013)*	*(0.023)*
young_mother	-0.112**	-0.190	-0.310	-0.086	-0.337***	-0.313***	-0.231***	-0.189***
	(0.046)	*(0.213)*	*(0.419)*	*(0.235)*	*(0.111)*	*(0.098)*	*(0.051)*	*(0.060)*
father_not_working	-0.035	-0.024	-0.094	0.049	-0.146***	-0.068	0.067	0.029
	(0.060)	*(0.059)*	*(0.061)*	*(0.060)*	*(0.056)*	*(0.056)*	*(0.058)*	*(0.076)*
mother_not_working	0.078	0.163	0.163	0.045	-0.103	0.124	0.007	0.147
	(0.125)	*(0.128)*	*(0.132)*	*(0.150)*	*(0.123)*	*(0.125)*	*(0.115)*	*(0.135)*
mother_housewife	0.263***	0.129**	0.078	0.080*	0.023	0.013	0.032	0.051
	(0.052)	*(0.051)*	*(0.050)*	*(0.047)*	*(0.044)*	*(0.042)*	*(0.043)*	*(0.054)*
parental_ISEI	0.022***	0.017***	0.015***	0.013***	0.012***	0.013***	0.011***	0.011***
	(0.002)	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*
μ1	1.082***	0.545***	-0.059	-0.541***	-0.929***	-1.141***	-0.986***	-1.357***
	(0.170)	*(0.184)*	*(0.185)*	*(0.201)*	*(0.157)*	*(0.182)*	*(0.212)*	*(0.253)*
μ2	1.781***	1.329***	0.956***	0.721***	0.541***	0.387**	0.429**	0.059
	(0.171)	*(0.185)*	*(0.186)*	*(0.201)*	*(0.157)*	*(0.181)*	*(0.210)*	*(0.254)*
μ3	2.918***	2.553***	2.314***	2.202***	2.106***	2.006***	2.039***	1.873***
	(0.175)	*(0.188)*	*(0.191)*	*(0.204)*	*(0.161)*	*(0.185)*	*(0.212)*	*(0.256)*
Log-Likelihood	-4,313.82	-4,350.38	-4,112.16	-4,248.95	-4,522.66	-4,288.62	-3,987.23	-2,277.09
Pseudo-R2	0.147	0.124	0.124	0.120	0.110	0.127	0.116	0.124
N. Observations	4,442	3,887	3,567	3,849	4,304	4,219	3,879	2,346

Table 3a: Ordered Probit for Completed Education — Spain (Robust Standard Errors in Parenthesis)

VARIABLE	1940-1945	1946-1950	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1980
gender	0.466***	0.374***	0.328***	0.196***	-0.085*	-0.115**	-0.206***	-0.290***
	(0.057)	*(0.053)*	*(0.051)*	*(0.046)*	*(0.043)*	*(0.045)*	*(0.047)*	*(0.057)*
foreigner	0.549***	0.067	0.138	0.243**	0.066	0.047	-0.127	-0.127
	(0.212)	*(0.154)*	*(0.139)*	*(0.113)*	*(0.099)*	*(0.085)*	*(0.093)*	*(0.105)*
chronic_illness	-0.201***	-0.135**	-0.115**	-0.219***	-0.266***	-0.269***	-0.197**	-0.320***
	(0.059)	*(0.059)*	*(0.059)*	*(0.059)*	*(0.059)*	*(0.070)*	*(0.080)*	*(0.097)*
h_tertiary	0.738***	0.473***	0.792***	0.463***	0.498***	0.559***	0.349***	0.558***
	(0.157)	*(0.143)*	*(0.139)*	*(0.118)*	*(0.105)*	*(0.102)*	*(0.108)*	*(0.136)*
h_upper_secondary	0.717***	0.875***	0.738***	0.507***	0.365***	0.577***	0.317***	0.447***
	(0.130)	*(0.124)*	*(0.131)*	*(0.101)*	*(0.100)*	*(0.100)*	*(0.093)*	*(0.092)*
h_lower_secondary	0.481***	0.693***	0.585***	0.346***	0.290***	0.179**	0.197**	0.064
	(0.119)	*(0.146)*	*(0.112)*	*(0.119)*	*(0.092)*	*(0.077)*	*(0.078)*	*(0.073)*
h_primary_noeduc	*Reference Category*							
l_years_educ	0.086***	0.082***	0.091***	0.107***	0.101***	0.082***	0.093***	0.072***
	(0.013)	*(0.013)*	*(0.012)*	*(0.011)*	*(0.011)*	*(0.010)*	*(0.011)*	*(0.013)*
usual	-0.517***	-0.504***	-0.345***	-0.377***	-0.144*	-0.264***	-0.431***	-0.540***
	(0.087)	*(0.088)*	*(0.086)*	*(0.084)*	*(0.086)*	*(0.087)*	*(0.103)*	*(0.117)*
frequent	-0.488***	-0.355***	-0.378***	-0.304***	-0.221***	-0.229**	-0.233**	-0.447***
	(0.095)	*(0.087)*	*(0.086)*	*(0.085)*	*(0.079)*	*(0.091)*	*(0.092)*	*(0.117)*
occasional	-0.476***	-0.276***	-0.216***	-0.279***	-0.201***	-0.193***	-0.216***	-0.277***
	(0.082)	*(0.077)*	*(0.073)*	*(0.063)*	*(0.058)*	*(0.062)*	*(0.067)*	*(0.080)*
rare	-0.253***	-0.138*	-0.115	-0.080	-0.195***	-0.163***	-0.095	-0.094
	(0.090)	*(0.079)*	*(0.074)*	*(0.062)*	*(0.060)*	*(0.061)*	*(0.061)*	*(0.076)*
absent	*Reference Category*							
no_father	-0.134	0.018	-0.172	0.150	-0.201	0.390*	-0.167	-0.001
	(0.201)	*(0.261)*	*(0.258)*	*(0.197)*	*(0.194)*	*(0.202)*	*(0.193)*	*(0.291)*
both_parents	0.024	0.018	-0.159	0.236*	-0.038	0.321**	-0.066	0.048
	(0.121)	*(0.147)*	*(0.158)*	*(0.123)*	*(0.133)*	*(0.135)*	*(0.138)*	*(0.166)*
n_siblings	-0.080***	-0.067***	-0.059***	-0.070***	-0.098***	-0.113***	-0.094***	-0.097***
	(0.014)	*(0.013)*	*(0.012)*	*(0.011)*	*(0.012)*	*(0.012)*	*(0.013)*	*(0.018)*
young_mother	-0.135	-0.095	-0.213	-0.761***	-0.102	-0.365***	-0.245***	-0.345***
	(0.180)	*(0.218)*	*(0.222)*	*(0.146)*	*(0.118)*	*(0.105)*	*(0.061)*	*(0.073)*
father_not_working	-1.041***	-0.468	-0.371	-0.291	0.096	0.001	-0.028	0.319*
	(0.389)	*(0.328)*	*(0.226)*	*(0.207)*	*(0.216)*	*(0.190)*	*(0.154)*	*(0.187)*
mother_not_working	0.457	0.070	-0.283	-0.091	-0.282	-0.141	-0.101	-0.288*
	(0.283)	*(0.297)*	*(0.241)*	*(0.218)*	*(0.199)*	*(0.246)*	*(0.245)*	*(0.172)*
mother_housewife	0.207***	0.063	0.133**	0.085	0.139***	0.200***	0.161***	0.069
	(0.066)	*(0.060)*	*(0.057)*	*(0.052)*	*(0.048)*	*(0.050)*	*(0.051)*	*(0.060)*
parental_ISEI	0.020***	0.022***	0.018***	0.021***	0.023***	0.015***	0.015***	0.014***
	(0.003)	*(0.003)*	*(0.003)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.003)*
μ1	1.230***	0.987***	0.483**	0.598***	-0.033	-0.109	-0.533***	-0.830***
	(0.179)	*(0.189)*	*(0.192)*	*(0.162)*	*(0.165)*	*(0.169)*	*(0.187)*	*(0.215)*
μ2	1.764***	1.645***	1.191***	1.394***	0.913***	0.851***	0.336*	0.142
	(0.180)	*(0.191)*	*(0.192)*	*(0.163)*	*(0.166)*	*(0.170)*	*(0.187)*	*(0.214)*
μ3	2.311***	2.230***	1.906***	2.220***	1.724***	1.676***	1.100***	0.983***
	(0.185)	*(0.193)*	*(0.195)*	*(0.165)*	*(0.168)*	*(0.172)*	*(0.187)*	*(0.214)*
Log-Likelihood	-1,787.62	-2,080.50	-2,376.32	-2,942.79	-3,246.90	-2,990.34	-2,731.65	-1,838.44
Pseudo-R2	0.189	0.150	0.134	0.135	0.125	0.115	0.111	0.121
N. Observations	2,217	2,088	2,097	2,471	2,684	2,464	2,286	1,582

*NOTE:*** significant at 0.01, ** significant at 0.05, * significant at 0.1; all the estimations include indicators for missing values (not shown).*

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