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Abstract

Primarily using data from the 2010 European Social Survey, we analyze intergenerational educational persistence in 20 European countries, studying cross-country and cross-cluster differences in intergenerational mobility; the role of gender in determining educational persistence across generations; and changes in the degree of intergenerational persistence over time. We find that persistence is highest in the Southern and Eastern European countries, and lowest in the Nordic countries. While intergenerational persistence in the Nordic and Southern countries has declined over time, it has remained relatively steady in the rest of Europe. Further, we find evidence of differences in intergenerational persistence by gender, with mothers' education being a stronger determinant of daughters' (instead of sons') education and fathers' education a stronger determinant of the education of their sons. Finally we see that for most clusters differences over time are largely driven by increasing mobility for younger women.

JEL Classifications: J62, I24, I38, D63

Key Words: Intergenerational Persistence; Educational Attainment; Educational Welfare States; Europe; Gender

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1 Introduction

Since as far back as the time of Sir Francis Galton (1869; 1889), there has been little doubt that descendants inherit at least some of their characteristics from their parents. Today, the questions around intergenerational persistence of social and economic outcomes are mainly not about its existence; instead, researchers are more interested in measuring its extent, its causes, and its development over time.[1]

Economists have traditionally concentrated their studies of intergenerational persistence on the transmission of income and wealth, while the intergenerational persistence of educational attainment has first become a more popular topic in the last several decades. These two sets of outcomes – monetary and educational – are certainly related, and the mechanisms which promote or distill their intergenerational persistence can be similar. Public policies which tax bequests and those which guarantee free and equal education to all, for example, promote social and economic success based on meritocracy as opposed to inheritance; a completely hands–off political system would likely result in very high intergenerational persistence in both spheres as parents would pass on all advantages (and disadvantages) they themselves faced to their children.

To the extent that a country's degree of intergenerational persistence depends on public policy, we can expect to see differences in persistence across countries. Indeed, existing studies have found great variation in both income and educational persistence around the world (see e.g. Solon, 2002; Hertz et al., 2007). Furthermore, the evolution of social and economic policy over time along with changing attitudes about and access to educational attainment is likely to have changed the strength of educational persistence across generations in the last century. Relatedly, the economic conditions and social mores which assign particular (and distinctive) roles to men and women have evolved such that women's formal education is more valuable and economically worthwhile than ever before.

Thus, this paper presents an analysis of the strength of intergenerational educational persistence across three dimensions. First, we study differences in persistence across countries and clusters of countries based on policy similarity in twenty European countries. Given this analysis, we may be able to draw inference on the effectiveness of public policy in promoting or hindering intergenerational persistence of educational attainment. Second, we give an extensive examination of the role of gender in intergenerational educational persistence, focusing on how intergenerational persistence in education differs when we consider various combinations of the gender of the parents and descendants (father–son; father–daughter; mother–son; mother–daughter). We ask whether men's and women's educational outcomes are more closely related to those of their mothers or fathers, and how the gender dimension of this phenomenon differs across countries. Thirdly, we analyze changes in the strength of the persistence over time, asking how the degree of the persistence has

[1] There is, of course, also the question of the optimal level of intergenerational persistence, which this paper does not address. For an excellent review of the history of thought on intergenerational mobility in economics, which does deal with this question, see Piketty (2000).

changed for descendants born in 1920 versus 1985, and the points between. Finally, we provide an integration of the three dimensions of the determinants of intergenerational mobility, country clusters, gender and changes over time.

In section 2 we present the theoretical background for this work and situate the paper in the existing literature on intergenerational educational persistence. Section 3 describes the data and methods used for the empirical analysis, section 4 presents the results, and we conclude by offering comments on the implications of our findings in section 5.

2 Theoretical Background

Children inherit some of their characteristics from their parents; this is true of social and economic characteristics as well as some genetic traits.[2] At least in part because of the social, economic, and cultural capital transmitted across generations, children of highly educated parents are more likely to be highly educated themselves than children of less educated parents are, and lower–educated parents are more likely to raise a lower–educated child. For example, figure 1a, which shows the average difference in education years of the children of high– versus low–educated parents,[3] shows that the educational premium of having a highly educated parent is at least two years in all countries; in some countries, it is well over five years. Even when examining this education year premium relative to the average years of educational attainment in a country as in figure 1b, the benefit of having a highly educated parent is high: in most countries, the premium is more than one quarter of the average years of schooling attained in the country. The ordering of countries does not change substantially when we consider the absolute or relative education premium of having a highly educated parent, meaning that differences in the average duration of education across countries does not help to explain the variation in the educational premium.

— Figure 1 about here —

How can we explain this persistence in educational attainment across generations? The classic application of the human capital model to this question by Becker and Tomes (1979; 1986) says that descendants' income is positively correlated with parental income due in large part to parents' investments in their descendants' education and the awareness of the positive effects of their doing so. An important example is the case of descendants' pre–school attendance. Children of more highly educated or high–earning parents are more

[2]The question of whether it is social or biological factors which are the source or medium of the transmission remains open. Björklund et al. (2007), using a sample of Swedish descendants, show that both "nature" (biology) and "nurture" (environment) matter: the economic outcomes of descendants are partly explained by the outcomes of their biological parents, and partly by those of their step- or adoptive parents. However, Bowles and Gintis (2002) provide evidence that biology plays a relatively minor role in the transmission process.

[3]Here "low–educated" parents are those with a maximum of lower secondary education (ISCED 0,1,2; see section 3.1); while "highly educated" implies having tertiary education (ISCED 5,6). In this case the higher education of both parents has been used.

likely to attend pre–school or early childhood education programs (because of their costs (see e.g. Magnuson et al., 2004, for empirical evidence from the US)), and early education is widely recognized as having clearly positive effects on a child's later outcomes (Heckman, 2008; Schütz et al., 2008; Cunha and Heckman, 2009; Currie and Almond, 2011; OECD, 2010).

Advantages are not only transmitted via investments in human capital. Esping-Andersen (2005, p. 14) states that it might not be unequal investments in children's education alone that drives intergenerational persistence, but instead that "[i]t is in early childhood that parental transmission is key." It is cultural and social capital[4] which is transmitted to children from their earliest days, and which influences their social, economic, and educational success throughout their lives. Cultural capital includes style of speech, physical appearance, skills, knowledge and attitudes as well as formal educational training. How parents project themselves in the world and to their children, then, has meaningful consequences on the behaviors that children learn for themselves. The three forms of capital interact with each other; more of one makes the others more easily accessible. Thus parental advantages are passed to children in part through investments in descendants' human capital and additionally through the culture of the family and its social networks. It is therefore both the family and child care institutions that influence children's early development, with economic capital often helping to assure quality child care which perpetuates advantages from one generation to the next.

Of course it is extremely difficult, if not impossible, to measure most factors of an individual's cultural or social capital. Empirical research on intergenerational persistence of social and economic outcomes can focus instead on the relatively reliable and easy–to–measure data on educational attainment. Like every empirical research study, this approach has its limitations; educational attainment does not tell the whole story of one's economic and social success. However, measuring the intergenerational persistence of educational attainment can provide important information about the inheritance of cultural and human capital.

Why study intergenerational educational persistence, instead of looking at the persistence of income across generations? Right now, the literature on the intergenerational persistence of income is much larger than that on educational attainment (see Blanden (2013) for a survey of both). However, measuring the intergenerational persistence in educational attainment rather than in income offers some crucial advantages; for three main reasons, education is a more reliable outcome to measure than income. First, since income changes through different life stages, obtaining reliable responses about lifetime earnings is difficult, at best. Measuring education instead offers a more straightforward measure that generally remains constant after a certain age (Nguyen et al., 2005). Second, reporting income – or any monetary measure – is subject to response bias, whereby respondents systematically under– or over–report their income (Bielby et al., 1977). Individuals may

[4]See the development of the theory of social capital in Bourdieu (1986).

be less inclined to misreport their educational attainment, as it is a less straight–forward measure of present well–being than income is. Finally, respondents, who are generally the descendants in the intergenerational persistence literature, are much more likely to *know* their parents' level of education than their parents' income at any point in time, producing less recall bias (see e.g. Nguyen et al., 2005; Black and Devereux, 2011). Thus we measure how similar descendants' educational attainment is to their parents'.[5]

One goal of this paper is to contribute to our understanding of how public policy can affect intergenerational educational mobility. Speaking more broadly about intergenerational persistence, Becker and Tomes (1986, p. 3) say that "[t]he degree of regression toward or away from the mean in the achievements of children compared to those of their parents is a measure of the degree of equality of opportunity in a society." In other words, societies which have higher intergenerational persistence in social and economic outcomes such as education provide less equal opportunity to their members than those with less persistence. While there is some degree of immobility in educational attainment in all countries around the world (Hertz et al., 2007), differences in policy structures and institutional arrangements across countries can prevent or support intergenerational persistence. Indeed figure 1a shows that there is a large difference in the educational "premium" enjoyed by descendants of high– versus low–educated parents across countries. Following theory and strong results in Schütz et al. (2008), which show that greater access to pre–school programs and later entrance into tracking programs is associated with lower intergenerational persistence in educational success across Europe, we suggest that these differences are in part related to variation in social policy regarding education.

As such, we expect to see changes in the degree of intergenerational persistence over time as well as across countries, as relevant social policy evolves. Policies aimed at creating more equal chances for all members of society and increasing efforts to create welfare systems during the last century addressed some of those factors that influence social transmission. For example, the expansion of publicly funded and freely available schooling and school supplies to Austrian children in the 1970s corresponded with a significant decline in intergenerational educational persistence after that time (Fessler et al., 2012). To identify these changes over time, we study persistence in educational attainment for different age groups, thus allowing us to identify temporal changes. Interestingly, the influential work of Hertz et al. (2007), which compares educational persistence over time for many countries, does not find a time trend of either rising or falling intergenerational correlation of education on a global basis. However, particular countries, such as the US and the UK, appear to exhibit slightly decreasing persistence over time (p. 41). Conducting an investigation of these developments over time for European countries is one aim of this paper. With a sample of 20 countries this can be done in more detail for different educational systems.

[5]Another option slowly growing in the literature would be to measure the persistence of self–reported *well–being* across generations. A recent study shows that results across Europe are similar to the results we get in this paper, even along the gender dimension (Molina et al., 2011).

Furthermore, in the existing literature, economists have largely left out an analysis of the role of gender in intergenerational persistence; most studies look only at the educational outcomes of fathers and their sons. Corak (2013, p. 81) notes that "[i]t is not that studies of mothers, daughters, and the marriage market do not exist, only that father–son analyses are more common and permit a broader set of cross–country comparisons." While analyzing the role of gender in intergenerational persistence complicates the story, there is enough theoretical and empirical reason to believe that the degree and source of the persistence differs based on the gender of the parent and descendant in question and that these differences are an important element in the overall picture of intergenerational persistence. Further, when and where differences exist, we may be able to comment on the degree of inequality of opportunity for women versus men.

Two theoretical frameworks from economics and sociology shed light on why there might be differences in educational persistence across generations depending on the gender of the parent and the descendant studied. The first is the household production model which first appeared in Becker and Tomes (1979; 1986) and was further developed by Chiswick (1988) and Gang and Zimmermann (2000) to account for the role of mothers' labor force participation in intergenerational transmission of human capital. Here mothers alone are responsible for the home production of children's education – a highly stylized aspect of a household production model which nevertheless parallels the empirical reality of mothers spending more time in education with their children than fathers (Sayer et al., 2004; Zick et al., 2001; Leibowitz, 1974). The model further says that fathers' education is important to their descendants' educational attainment only in that the fathers' higher education increases their earnings capacity, and some of the higher earnings are used to invest in the descendants' education. Mothers' education affects their children's educational attainment both through earning income and through direct household production, which are considered substitutes. As a mother's education increases, the opportunity cost of her home production increases, and she spends less time at home educating her children. Thus the model predicts that father's education has a more positive impact than mothers' education on the educational attainment of the descendants.

The household production model does not distinguish between male and female children. Thus a second theory of how gender matters in intergenerational educational persistence, namely a theory of role models and socialization within a household, can serve as a useful amendment to the household production model. Theory on socialization and role models suggest that some social and behavioral characteristics are transmitted from one generation to the next (Haveman and Wolfe, 1995). An relevant example is gender role attitudes, which are attitudes about how men and women "ought to" behave. Among other things, these attitudes prescribe norms about the importance and appropriateness of educational attainment for men and women. Gender role attitudes are passed from one generation to the next (Farre and Vella, 2013). In transmitting their ideas about gender and educational attainment to their children, parents with traditional educational attain-

ments, i.e. where the father is more highly educated than the mother, are more likely to encourage their sons to obtain higher education than they are to encourage their daughters. Similarly, more highly educated mothers are likely to encourage their daughters to obtain more education. Findings for Austria support this theory of gender role socialization in intergenerational educational persistence (Fessler and Schneebaum, 2012).

These two theories of the relevance of gender in intergenerational educational persistence, while partly in competition with each other, both suggest that the persistence in intergenerational educational attainment will differ by the gender of the parent and the descendant involved. While the household production model predicts that fathers are more important for both sons and daughters, the role–model theory would imply a stronger effect of the same–gender parent on the descendant. We therefore test the hypothesis that intergenerational persistence in educational attainment will differ by the gender of the parent and descendant. Further we integrate the dimensions of gender, country clusters and over–time effects to account for integrated impacts on intergenerational educational mobility. This allows for a more detailed illustration of the interconnections of these three dimensions and a better understanding of possible underlying causalities. It reveals for example not only how intergenerational mobility has changed over time by gender, but also whether different developments in country clusters originated in distinctive gender trends. In the next section, we describe the data and methods used to test these hypotheses.

3 Data and Methods

3.1 Data

Our data come from the 2010 European Social Survey (ESS) (Norwegian Social Science Data Services, 2010), which was the fifth and (in terms of parental and descendants' education) most comprehensive wave of the survey.[6] The ESS collects data on the International Standard Classification of Education (ISCED) level of education achieved for each respondent and the respondents' mothers and fathers. We converted the data on the ISCED level of education into the number of years of schooling necessary to obtain that level of education in the respondents' countries. We did this by matching the ISCED code with the United Nations Educational, Scientific and Cultural Organization (UNESCO) data on school years needed for ISCED level achievement (UNESCO, 2012). Although there are differences in educational systems and the level of detail collected about educational attainment across countries in the ESS, converting the ISCED level into the minimum number of years needed for a respondent's education allows us to make the survey as objective and homogeneous as possible. This conversion creates a more continuous measure of educational attainment, which allows us to calculate intergenerational educational elasticities and correlations (see section 3.2 below). Blanden (2013, pp. 44–45), following Dearden et

[6]Italy did not participate in the survey after round 2 (2004) and the round 5 data are not yet available for Austria, so we used data from round 2 and 4 for these countries, respectively.

al. (2002), points out that measuring educational achievement with the number of years in education is not ideal for a study of intergenerational elasticities/correlations, because it assumes that the relationship between the educational attainment of the parent and descendant generation is linear and monotonic. However, Blanden (2013) shows that a comparison of two international studies, one which used years of education to obtain intergenerational elasticities/correlations (Hertz et al., 2007) and the other which used academic degrees obtained to measure an intergenerational association of education (Chevalier et al., 2013), yields fairly highly (0.49) positively correlated results.

We include only respondents aged 25 or older in our study, to minimize the number of cases in which the respondents were still studying at the time of the survey. For most of the analysis, a sample of those aged 25–65 is used, to focus on people still in the labor market; the exception is the analysis of time trends in intergenerational correlations, where we study all descendants up to 90 years of age. In total we observe 14,514 (11,291) men and 16,218 (12,424) women between 25–90 (25–65) in 20 different countries. We use only observations for which we have information on the educational attainment for both the mother and the father of the descendant. All results are calculated using the design weight provided in the ESS.

As shown in table 1, both men and women in the descendant population are more highly educated than those in the parent generation; sons and daughters have, on average, more than three years more education than their same–gender counterparts in the older generation. Men in both generations completed more years of schooling than women, yet women are closing the gap and the overall difference between sons and daughters is only marginal. In most countries, the daughters have completed more years of schooling than the sons, with the only exceptions being some of the Continental and Southern countries (Austria, Germany, Greece, Italy, Netherlands, Portugal and Switzerland). For the parental generation, the situation is completely different: the mothers have fewer years of education than the fathers. Only in Denmark, Ireland and Sweden, mothers have on average more years of education than fathers.

— Table 1 about here —

Cross–country differences in these means are profound. Norway's men and women aged 25–65 have an average of 15.05 and 15.08 years of education, respectively, the highest average in the dataset. On the other hand, men and women in Portugal have only 8.35 and 7.92 years of education, respectively. Portugal is the only country whose average years of education for the descendants is under ten years, but there are quite a few countries in which the parents have less than ten years of education. However these differences are in part due to different education systems and different program lengths, meaning that an identical ISCED–level in two different countries can be obtained from a different number of schooling years. Our educational year averages are slightly higher than those published by the United Nations (United Nations Development Program, 2013, p. 144) for all countries,

very likely because our mean education years are limited to people aged 25–65, which excludes older and thus generally less educated people. Based on this comparison, our schooling years seem justified.

In every country in Europe, the average level of educational attainment from one generation to the next has increased. At the same time, the distribution of educational attainment has become wider in the younger generation, meaning that there is greater variation in the years of education attained by the respondents compared to their parents. This becomes important in calculating intergenerational persistence, as explained in the next section.

3.2 Intergenerational Elasticities and Correlations

We provide a measure of the strength of the persistence of educational attainment in one generation to the next by calculating intergenerational educational elasticities and correlations. The model used to estimate an intergenerational educational elasticity $\hat{\beta}$ can be written as

$$E_i^d = \alpha + \hat{\beta} E_i^p + \varepsilon_i \; \forall \; i = 1, 2, \ldots, N \tag{1}$$

where E_i^d is the educational attainment of descendant i, and E_i^p is the average educational attainment of both parents (father and mother) of descendant i, and ε_i is a normally distributed error term with a mean of zero and a constant variance σ^2. The constant α provides a level effect, indicating the descendant's education if the parents had zero years of schooling. The OLS estimate $\hat{\beta}$ is

$$\hat{\beta} = \rho_{dp} \frac{\sigma_d}{\sigma_p} \tag{2}$$

where σ_d and σ_p represent the standard deviation in the educational distribution of the descendant and parent populations, respectively, and ρ_{dp} is the correlation coefficient between the descendant and parent population. This exposition makes it clear to see that a change in $\hat{\beta}$ may not necessarily be due to a change in the relationship between the educational attainment of the two generations; a change in the distribution of the educational attainment of either descendants or parents would also change the elasticity $\hat{\beta}$. Since the distribution of educational attainment has changed drastically from one generation to the next in practically every country in our dataset (see table 1), the elasticity would give the wrong impression about the actual intergenerational educational mobility, overstating it when the standard deviation of the distribution of the descendant population's educational attainment is higher than the parents', and understating if it is larger for the parents.

Therefore, we estimate intergenerational educational correlations γ. These correlations normalize the educational attainment of a population by the standard deviation of their educational distribution (see e.g. Black and Devereux, 2011; Blanden, 2013):

$$\frac{E_i^d}{\sigma_d} = \alpha + \hat{\gamma}\frac{E_i^p}{\sigma_p} + \varepsilon_i \ \forall \ i = 1, 2, \ldots, N. \tag{3}$$

By calculating these educational correlations, we are able to compare the strength of the relationship of parental and descendant educational attainment across countries and over time, although the distribution of educational attainment in these various subpopulations may be quite different.

Finally, in calculating gender–specific elasticities and correlations, we model the relationship between the educational attainment of a descendant and *both* their mother and father.[7] We use both parents' educational attainment (separately, while controlling for the other (see e.g. Gang and Zimmermann, 2000)) in order to be able to tease out the gender–specific nature of intergenerational persistence. Thus we model

$$E_i^d = \alpha + \hat{\beta}_1 E_i^f + \hat{\beta}_2 E_i^m + \hat{\beta}_3(E_i^f * \delta) + \hat{\beta}_4(E_i^m * \delta) + \hat{\beta}_5(\delta) + \varepsilon_i \ \forall \ i = 1, 2, \ldots, N \tag{4}$$

for the gender specific intergenerational elasticities and

$$\frac{E_i^d}{\sigma_d} = \alpha + \hat{\gamma_1}\frac{E_i^f}{\sigma_f} + \hat{\gamma_2}\frac{E_i^m}{\sigma_m} + \hat{\gamma_3}(\frac{E_i^f}{\sigma_f} * \delta) + \hat{\gamma_4}(\frac{E_i^m}{\sigma_m} * \delta) + \hat{\gamma_5}(\delta) + \varepsilon_i \ \forall \ i = 1, 2, \ldots, N \tag{5}$$

for the gender–specific intergenerational correlations, where E_f is the educational attainment of the father and E_m is that of the mother, and δ is a dummy variable equal to 0 for sons and 1 for daughters. We interact parental education with the gender dummy variable to capture the differing relationship of parental (mother and father) education with descendant education for sons and daughters. $\hat{\beta}_1$ ($\hat{\gamma_1}$) will give us the intergenerational elasticity (correlation) between the educational attainment of fathers and sons; $\hat{\beta}_2$ ($\hat{\gamma_2}$) for mothers and sons; $\hat{\beta}_1 + \hat{\beta}_3$ ($\hat{\gamma_1} + \hat{\gamma_3}$) for fathers and daughters; and $\hat{\beta}_2 + \hat{\beta}_4$ ($\hat{\gamma_2} + \hat{\gamma_4}$) for mothers and daughters. Lastly, $\hat{\beta}_5$ ($\hat{\gamma_5}$) is the coefficient on a control variable for gender, which is positive (negative) when daughters have higher (lower) education than sons.

3.3 Country Clustering

Some countries are more alike than others in their social welfare state policies regarding education. The strength of the intergenerational persistence of education is related to, and indeed in some sense a function of, social policy which promotes meritocratic ideals (or not). Therefore, we analyze intergenerational educational mobility in countries alone and

[7] Indeed most studies use only the education level of the father. As far as we know the literature, earlier studies which estimated a joint effect of mothers and fathers dealt with differences in the education level of the two parents by taking the average of both the father's and the mother's education to build the parental education variable (e.g. Hertz et al., 2007). In an Austrian study, Fessler et al. (2012, pp. 77–78) say that due to assortative mating of the parents, taking the average or taking the maximum of the parents' education leads to very similar results.

as a part of so–called "country clusters". Clustering countries together is not a trivial task; here we explain how we formed clusters for this analysis.

As explained in Beblavy et al. (2011), clustering countries for analyses such as this one can follow any of several lines of thought: the clusters can be built based purely on institutionalized educational arrangements (such as whether schools are universal or differentiated); by linking aspects of the educational system to those of the labor market (for example studying emphasis on group work in schools and in industrial organizations); or by looking at models of public education in terms of their contributions to social welfare. Using the first method, Hoffmeyer-Zlotnik and Warner (2007) build four clusters of (mostly) European countries with similar educational systems. Green (1991) uses the second method, which links a country's educational system with labor market outcomes to form five clusters, but focuses mainly on educational models in higher education, which are not completely compatible with this study.

The third approach, which is employed here, links public welfare systems and the educational system following the country–clustering typology of Esping-Andersen (1990). This approach assumes that a trade–off between educational spending and spending on other welfare policies exists, in particular that states decide whether to spend money on education policy now to avoid having to make transfers afterwards (because education should presumably protect people from needing public support later on) or to focus on social insurance programs instead of education. Consequently Esping-Andersen (1990) defines three types of welfare states: the liberal or Anglo–Saxon model, that invests mainly in education; the conservative–corporatist or Continental model, that tends towards social insurance; and the social–democratic or Nordic model, that spends on both welfare policies.

Apart from these three "worlds of welfare capitalism," several scholars have proposed additions, with many of them including a Southern or Mediterranean type of welfare state cluster (Ferrera, 1996; Bonoli, 1997). This Mediterranean group of countries are characterized by fragmented social security systems and high reliance on family structures for social and economic welfare (Ferrera, 1996). The question of whether the Eastern European countries can be incorporated into the existing clusters or whether they form a distinctive group of their own has been a matter of discussion. Fenger (2007) uses hierarchical cluster analysis to find a classification for Central and Eastern European countries, finding overall support for a separate Eastern European cluster despite differences within the cluster. The results point out that those Central and Eastern European countries used in the current study can be grouped into one cluster, characterized by steady economic development and simultaneously with a more egalitarian society, especially in comparison to Russia, Belarus or Moldova (Fenger, 2007, p. 24).

Several papers in the sociology of education literature find that the landmark work on identifying and defining country clusters by welfare regime policy by Esping-Andersen (1990) can be generally applied to fit cross–national educational policy differences. Peter et al. (2010), for example, analyze 2003 Programme for International Student Assessment

(PISA) test scores within and across both schools and countries, and find that there is the most across–school inequality in math, reading, and science scores in countries in the conservative (Continental) cluster, and the least inequality in the social democratic (Nordic) cluster. They find relatively low within–school inequality in the Conservative countries, which may be surprising on first glance, but which the authors explain to be a function of the early tracking programs in most of the countries in this cluster, which separated low– and high–achieving students from an early age.

Thus we use a five–type model of welfare states, including an Anglo–Saxon cluster (Ireland and the UK), a Nordic cluster (Denmark, Finland, Norway and Sweden), a Continental cluster (Austria, Belgium, France, Germany, Netherlands and Switzerland), a Southern cluster (Greece, Italy, Portugal and Spain) and an Eastern European cluster (Bulgaria, Czech Republic, Hungary and Poland).[8] As documented in the existing literature, the countries within each cluster share a similar welfare system and therefore provide hints regarding the relationship between different welfare and education policies and intergenerational educational persistence. Nevertheless differences in welfare systems and educational mobility between some countries within clusters still exist; these differences will be discussed in further detail below.

4 Empirical Results

4.1 Intergenerational Educational Persistence by Country and Cluster

We begin the analysis of our empirical results with an examination of intergenerational persistence across countries and country clusters. Table 2 presents the intergenerational educational correlations between parents and their working–age (25–65) descendants in 20 European countries We focus our description on the correlations presented in table 2 instead of the elasticities, because – as described in section 3.2 – the correlations give a better measure of persistence across generations, since they eliminate the possibility that the intergenerational relationship is based in part on structural changes to the educational distribution across generations.[9]

— Table 2 about here —

The bottom row of table 2 shows that the intergenerational correlation between all parents and all descendants (equation 3) is rather high, at 0.486. Thus, after accounting

[8]When performing analyses by cluster, we take averages of the results for each country in the cluster, which gives each country an equal "weight" in determining cluster–level effects, regardless of differences in populations across countries in a cluster.

[9]The elasticities are shown in table A.1 in the appendix. For almost all countries and clusters, the correlation between parent's and descendant's educational attainment is higher than the elasticity. This result occurs because in these populations, the standard deviation of the parental educational distribution is generally larger than in the descendant population (see equation 2, and the relevant descriptive statistics in table 1).

for differences in the distribution of educational attainment across generations, a one year increase in parental education is correlated with an additional half year of schooling for the descendants. This estimate is consistent with those of Hertz et al. (2007); in the thirteen countries that their analysis has in common with this one, they get an average correlation of 0.40. Their estimate is lower than our overall estimate because our analysis includes seven additional countries, all of which have higher intergenerational correlations.

Table 2 reveals that intergenerational educational persistence is quite different across our five country clusters. The educational correlation between all parents and all descendants is the lowest in the Nordic cluster, at 0.433, while it is 0.478 for the Continental and 0.490 for the Anglo–Saxon clusters. The highest correlations are found in the Eastern and Southern clusters, with intergenerational correlations of 0.520 and 0.517, respectively. These results indicate quite a bit of variation of intergenerational educational mobility across Europe. The five country clusters have a wide range of intergenerational correlations.

Looking closer at the correlations on the country level reveals that the four Nordic nations are all among those countries with the lowest correlations. Furthermore the intergenerational correlations in the four Nordic countries are rather similar, ranging from just 0.406 (Denmark) to 0.454 (Norway). The two Anglo–Saxon countries (the UK at 0.461 and Ireland at 0.519) show similar (to each other) but distinctly higher (than the Nordic countries) correlation rates. The other clusters do not reveal these clear similarities inside the clusters themselves.

Some countries within the Continental cluster have a similar intergenerational correlation (the range for Austria, France, the Netherlands and Switzerland is between just 0.447 and 0.485), but Belgium shows exceptionally high persistence (0.570), and Germany shows remarkably low persistence (0.412).

The Southern countries are among the least mobile ones, but with especially high correlations for Portugal (0.553) and Spain (0.588). However, one nation in this relatively high–persistence cluster, Greece, places in the group of the most mobile countries in Europe, with an intergenerational correlation of 0.425.

Finally, the countries in the Eastern cluster have the highest correlations, but again there are two exceptions. On the one hand, this generally highly persistent cluster contains the Czech Republic, which turns out to be the most mobile country in this dataset with an intergenerational correlation of 0.400. On the other hand, the cluster also contains Bulgaria, which is the the least mobile country in the sample with an intergenerational correlation of 0.620.

Overall, although we observe quite a strong variation in the intergenerational correlations across country clusters with results ranging from 0.400 in the Czech Republic and 0.406 in Denmark to 0.588 in Spain and 0.620 in Bulgaria, there exists educational persistence in all European countries. The cluster–level analysis shows the Nordic cluster is the least persistent, and the Eastern and Southern clusters are the most.

4.2 The Gendered Nature of Intergenerational Educational Persistence

Table 2 presents intergenerational educational correlations by the gender of the parent and the descendant, in the columns titled father–son, mother–son, father–daughter, and mother–daughter. These are the estimates for γ_1, γ_2, $\gamma_1 + \gamma_3$, and $\gamma_2 + \gamma_4$ from equation 5, respectively. The last column of the table, titled female, gives the coefficients for the dummy variable on the gender of the descendant (γ_5 in equation 5), showing whether being female is linked with a higher (positive value) or lower (negative value) education than that of the male descendants.

The differences in the intergenerational correlations across gender–pairs are rather striking. Across Europe, fathers are more influential for the education of the sons than mothers are, in the sense that the persistence of educational outcomes between fathers and sons is higher than for any other gender pair: the averages across Europe show that the correlation between fathers and sons (0.331) is higher than between mothers and sons (0.185). Some exceptions to this rule do exist; in Portugal, the persistence between mothers and sons is stronger than that between fathers and sons. Fathers' educational attainment also appears to be more important for sons than it is for daughters (across Europe the intergenerational correlation is 0.331 compared to 0.259), as predicted by the socialization model discussed in section 2, which says that descendants would follow more closely in their same–gender parents' educational path than in their cross–gender parents'. In Belgium, the Netherlands, Switzerland, the UK, Italy and Portugal this is not the case, although these differences are small, except in Italy.

Similarly, the relationship between the educational attainment of mothers and their daughters is stronger than between mothers and their sons. Again these results support the role–model discussion presented in section 2. The average correlation of educational years between mothers and daughters is 0.290, compared to 0.185 between mothers and sons. It is rather remarkable that only in Belgium, Finland, and the UK, the persistence between mothers' and sons' educational attainment is stronger than between mothers and daughters, and in the latter two countries, those differences are very small. On average, the correlation between fathers' and daughters' education (0.259) is weaker than between mothers and daughters (0.290), although there is variation on a country level, this is true for all Eastern and Nordic countries.

Finally, the last row of table 2 gives the coefficient on the female dummy variable in equation 5. The magnitude of this coefficient is not straightforward to interpret, because the outcome variable is the years of education divided by the standard deviation of the education years in a country. However, the sign of the coefficient tells us whether it is men or women in a country who have completed more years of education. The results are consistent with those in table 1.

The household production model discussed in section 2 predicts that fathers' increased educational attainment always has a positive effect on the (genderless) children's educa-

tional attainment, while an increase in mothers' educational attainment has an ambiguous effect. Our results show that the hypothesis is correct, insofar that fathers' increased educational attainment has a positive effect on children's educational attainment, and this effect is generally (but not always) stronger than it is from mothers' increased education. The results further show, though, that there are seemingly systematic differences in the strength of the intergenerational persistence based on the gender of the parent *and descendant* in question. Fathers' education is more strongly correlated to sons', while mothers' education is more strongly related to daughters'. In general, though, sons' education is more strongly related to their parents' education than that of daughters. While in many countries it is the fathers whose educational attainment is strongly correlationed to the education levels ofboth sons and daughters, in the Nordic and Eastern countries it is mothers' education that appears to be more strongly correlated with daughters' education.

4.3 Changes in Intergenerational Educational Persistence Over Time

The previous two sub–sections analyzed intergenerational educational persistence in Europe for people of working age (25–65). While illuminating, these findings are limited to this age group. In this section, we broaden our analysis to the population of respondents between 25 and 90 years old, and examine how the intergenerational educational correlation has developed over time. This analysis studies the correlation between all descendants and all parents (regardless of gender), where parental education years are taken to be the average of a descendant's mother's and father's educational attainment.

Figure 2 shows the average intergenerational correlation per age group (in 1–year cohorts; thus all people born in a certain year) in each country cluster, with a fitted line with slope τ[10] to show the development of the correlation over time. The Nordic and Southern clusters show a clear and statistically significant decline in intergenerational mobility, while there has not been a significant change in the intergenerational educational correlation for adults between the ages of twenty–five and ninety in the three other clusters.

— Figure 2 about here —

In the Nordic cluster, there was a clear decline in intergenerational persistence from about 0.500 for those aged 90 to 0.350 for respondents aged 25. For the Southern countries, there is also a significant drop in the correlation, starting from the highest point of all clusters (0.600) and going down to slightly above 0.400 for the 25 year–old descendants. These results are highly statistically significant. In the Eastern, Continental and Anglo–Saxon clusters, the level of intergenerational persistence has not changed much over time, but with a slight downward trend in the Continental and Anglo–Saxon clusters and a

[10]The OLS equation employed to fit the line is $\gamma_{ac} = \alpha + \tau_1 age_{ac} + \varepsilon_{ac}$, where γ are intergenerational educational correlations, α is a constant term and ε is an error term with the usual properties for every age group a in each country c. The cluster correlations are taken as the average of the τ coefficients for the cluster.

constant trend in the Eastern cluster. Note that in some countries within these clusters there are significant changes over time (see figure A.1), but there is no consistent pattern within the cluster.

There is greater variance in the intergenerational correlation over age in some clusters compared to others. The correlations in the Eastern cluster huddle fairly consistently around 0.500 over time, with more variance for the older groups, as in the Continental cluster, at slightly lower correlations. Interestingly, the data also do not indicate any change for the time after the transformation in 1989. The Anglo–Saxon and Southern clusters show the greatest variance, especially for older age cohorts, which could be due to the smaller number of observations of descendants aged 65 and above. The average intergenerational correlation in the Nordic cluster appears to be well below 0.500, confirming the results discussed in section 4.1 that this cluster has the lowest intergenerational persistence. The average correlation over age appears to be highest in the Eastern and Southern clusters. These results fit the rationalization of our country clustering, which says that countries in those clusters are less inclined to policy to expand access to education. The general downward trends in the Continental, Nordic, Anglo–Saxon and Southern clusters also fit the policy profile of those clusters: over the last ninety years, access to education has expanded. Interestingly, there is no such evidence for the Eastern European countries in our sample, implying that despite aiming at societal equality via state socialism, educational persistence is rather high and has remained steady for almost a century. Yet we note that our sample of Eastern Europe is restricted to only four countries, which each have very different developments of educational persistence. However, looking at the trend on the country level (see appendix figure A.1), one sees that – with the exception of Bulgaria – intergenerational persistence has decreased over time in all countries.

Thus, we see significant changes to intergenerational educational persistence over time in Nordic and Southern countries, with the youngest cohorts in the Southern cluster now reaching correlation rates similar to those in other clusters, despite the relatively high persistence faced by older descendants in that cluster. In Continental, Anglo-Saxon and Eastern countries, the intergenerational persistence did not change significantly over time. More research, especially from political scientists, would complement this analysis nicely, in that it would help explain which political mechanisms foster or hinder intergenerational persistence, and how and why they differ across countries.

4.4 An Integration of the Results

After having examined differences in intergenerational persistence by country and country cluster, gender, and age separately in sections 4.1–4.3, we now integrate these three dimensions of socio–demographic difference into a single analysis. Figure 3 shows the development of the average intergenerational correlation for five–year cohorts by country clusters over time, for men and women separately. These age cohorts are larger (five years instead of one year) than those used in section 4.3 because the split by gender makes the

sample sizes too small for some years. Thus, to get more representative results, we use five–year cohorts.[11]

A line fitting the equation $\gamma_{cg} = \alpha_{cg} + \Phi * agecohort_{cg} + \varepsilon_{cg}$ for the subsamples of each country–cluster c and gender g predicts the intergenerational correlation γ by age cohort.

— Figure 3 about here —

A first result from figure 3 is that intergenerational educational persistence does vary greatly by country cluster, gender, and age, and that its development over time is very different for these different socio–demographic groups. For all ten groups shown in figure 3, educational persistence has either stayed the same or sunk over time (positive Φ), but persistence has not increased. Eastern men are the only exception, showing a slightly negative Φ (rising persistence over time), though this result is not statistically significant. In half of the countries the change in the persistence over time is small and statistically insignificant, while in the others – such as women in the Southern cluster – the development is very strongly positive and statistically significant. Thus these three socio–demographic groups experience the strength of the change in intergenerational educational persistence over time quite differently.

Further, there are differences in the degree of intergenerational persistence that members of these ten groups face at any point in time. For the descendants who were 25–29 years old in 2010, the degree of intergenerational correlation took on a large range of values across clusters, from about 0.300 for women in the Nordic cluster to about 0.550 for men in the Eastern cluster. Similarly, when the respondents were 80–90 years old in 2010, the persistence also varied tremendously across country cluster: men of that age in the Nordic cluster faced intergenerational correlations of about 0.425, while women in the Southern cluster faced much higher persistence, at about 0.650. Even within a cluster, men and women faced different degrees of intergenerational persistence; only in the Continental cluster do men and women have similar correlations all along the age distribution.

Finally, figure 3 shows the *necessity* of including all three of these dimensions of difference into an analysis of the determinants of intergenerational persistence. An example of the relevance of gender will illuminate. In figure 2 and the accompanying discussion in section 4.3, we saw that there was a statistically significant drop in intergenerational persistence over time in the Nordic and Southern clusters. When we look more closely at the gendered nature of these changes using figure 3, though, we see that it is only female descendants who experienced declining intergenerational persistence over time; the men in these clusters show no significant change in persistence over time. Thus, while figure 2 provided insight regarding differences in changes over time by cluster, including the gender analysis in figure 3 provided a more complete account of how intergenerational persistence changed over time, and for whom.

[11] Since there are some cases in which there are no men or women over 80 in a country or a cluster, we use an eleven–year cohort (ages 80–90) for this group.

5 Discussion and Conclusions

This analysis of intergenerational educational persistence across Europe has shown that people's educational attainment is influenced by that of their parents. Across Europe, an additional year of education for parents is correlated with an additional half year of education for descendants. However, this estimate is the average intergenerational correlation across Europe; indeed the strength of the relationship between parental and descendant education differs greatly by country. While the Nordic countries generally show lower rates of persistence (ranging from 0.406 to 0.454), it is especially the Southern and Eastern European nations that reveal higher persistence (with correlations up to 0.620).

This paper further shows the highly relevant role of gender in understanding intergenerational educational persistence. Across Europe, it is the fathers whose education is the critical determinant of sons' educational attainment, while mothers' educational attainment matters most for their daughters' education. In most countries, fathers' education is also more influential for the educational attainment of the sons than for that of the daughters. Yet daughters are especially dependent on the education of their mothers in the Nordic and Eastern countries, as well as in France. These results show that the gender of both the parent and the descendant is crucially important in passing on educational advantages or disadvantages from one generation to the next. The household production model discussed in section 2 therefore does not adequately predict the relationship between parental and descendant education. This may be because the model does not reflect the modern reality of women's high labor force participation and changing social norms, which hold fathers responsible for children's education as much as mothers. Instead, the patterns of the strength of the intergenerational correlations by gender suggest that gender role attitudes and role models within a household are important in determining people's educational attainment, as descendants are most likely to follow in their same–gender parents' educational footsteps.

These findings can have important implications for policy aimed at reducing and eliminating the gender wage gap and gender–based occupational segregation. These gaps are explained in large part by women's occupational choice, labor market supply (the number of hours spent in the labor market), and labor market discrimination. For all these reasons (which also overlap each other), women's investment in higher education does not pay off as much as men's. Public policy offering universal and high quality child care can help bridge the gap between high education and labor market equality for women. First, child care can be made high–quality, by demanding more highly educated caregivers, and providing high–paying jobs for highly educated employees – who are, in that sector, mainly women. Second, it would promote women's employment in other sectors which demand highly educated workers with flexible schedules by providing care for their children while they are at work. Thus women's labor market supply could increase and women could become more willing to enter traditionally male fields. At the same time, the stereotype

of women being uncommitted to work would fade as their opportunities to do more work expand. These changes could reduce discrimination against women, further enhancing the first two effects. The children of these highly educated mothers – and especially daughters, following the results in this paper – would benefit by positive gains to their own education, by having more income in the household, by receiving better childcare, and by having a positive role model in the household. Thus a virtuous circle of women's advancement in the labor market could develop.

Finally, taking the analysis some decades back and looking at those born in 1920 and afterwards, we find that intergenerational educational persistence has decreased in Nordic and Southern countries, while there has been no significant change in the rest of Europe. However taking a closer look by gender gives a more nuanced story. In the Anglo-Saxon cluster it is only men who show a significant decrease in their intergenerational educational persistence; in the Continental cluster both men and women experienced a significant decline in the intergenerational persistence; and the Eastern European countries reveal no significant change in persistence over time. On the other hand the Nordic and Southern countries the downward trend we observe for the entire cluster is very clearly driven by decreases in intergenerational persistence for women. Indeed the persistence has not significantly changed for men in neither of these clusters and persistence for men in the Southern countries remains relatively high. Thus this analysis shows the importance of studying not only cross–country differences in intergenerational mobility but also differences over time and by gender.

The positive results for the Nordic countries – low persistence, which has become even lower over time – suggest that other countries looking to reduce their intergenerational persistence could learn from Nordic social policy. In general, an important lesson from this paper is that the intergenerational persistence in educational outcomes is variable and depends on institutional context and historical period. Thus, it can change: movement towards more meritocratic ideals (hence lower intergenerational persistence) will be a matter of social commitment to these goals.

References

Beblavy, Miroslav, Anna-Elisabeth Thum, and Marcela Veselkova, "Education Policy and Welfare Regimes in OECD Countries. Social Stratification and Equal Opportunity in Education," Technical Report 357, Center for European Policy Studies Working Document December 2011.

Becker, Gary S. and Nigel Tomes, "An equilibrium theory of the distribution of income and intergenerational mobility," *Journal of Political Economy*, 1979, *87*, 1153–1189.

_ **and** _ , "Human Capital and the Rise and Fall of Families," *Journal of Labor Economics*, 1986, *4* (3), 1–39.

Bielby, William T., Robert M. Hauser, and David L. Featherman, "Response errors of black and nonblack males in models of the intergenerational transmission of socioeconomic status," *American Journal of Sociology*, 1977, *82* (6), 1242–1288.

Björklund, Anders, Markus Jäntti, and Gary Solon, "Nature and Nurture in the Intergenerational Transmission of Socioeconomic Status: Evidence from Swedish Children and Their Biological and Rearing Parents," *The B.E. Journal of Economic Analysis & Policy*, 2007, *7* (2), 1–23.

Black, Sandra E. and Paul J. Devereux, "Recent Developments in Intergenerational Mobility," in Orley Ashenfelter and David Card, eds., *Handbook of Labor Economics*, Amsterdam: Elsevier, 2011, pp. 1487–1541.

Blanden, Jo, "Cross-Country Rankings in Intergenerational Mobility: A Comparison of Approaches From Economics and Sociology," *Journal of Economic Surveys*, 2013, *27* (1), 38–73.

Bonoli, Giuliano, "Classifying Welfare States: a Two-Dimensional Approach," *Journal of Social Policy*, 1997, *26* (3), 351–372.

Bourdieu, Pierre, "The Forms of Capital," in John Richardson, ed., *Handbook of Theory and Research for the Sociology of Education*, New York: Greenwood Press, 1986, pp. 241–258.

Bowles, Samuel and Herbert Gintis, "The Inheritance of Inequality," *Journal of Economic Perspectives*, 2002, *16* (3), 3–30.

Chevalier, Arnaud, Kevin Denny, and Dorren McMahon, "Intergenerational Mobility and Educational Equality," in Peter Dolton, Rita Ashplund, and Erling Barth, eds., *Education and Inequality Across Europe*, London: Edward Elgar, 2013, pp. 260–281.

Chiswick, Barry R., "Differences in Education and Earnings across Racial and Ethnic Groups: Tastes, Discriminations, and Investments in Child Quality," *Quarterly Journal of Economics*, 1988, *103* (3), 571–97.

Corak, Miles, "Income Inequality, Equality of Opportunity, and Intergenerational Mobility," *Journal of Economic Perspectives*, 2013, *27* (3), 79–102.

Cunha, Flavio and James J. Heckman, "The Economics and Psychology of Inequality and Human Development," *Journal of European Economic Association*, 2009, *7* (2-3), 320–364.

Currie, Janet and Douglas Almond, "Human Capital Development Before Age 5," in David Card and Orley Ashenfelter, eds., *Handbook of Labor Economics*, Vol. 4, Amsterdam: Elsevier Science Publishers, 2011, pp. 1315–1486.

Dearden, Lorraine, Steven McIntosh, Michal Myck, and Anna Vignoles, "The Returns to Academic and Vocational Qualifications in Britain," *Bulletin of Economic Research*, 2002, *54* (3), 249–274.

Esping-Andersen, Gøsta, *The Three Worlds of Welfare Capitalism*, Oxford: University of Oxford Press, 1990.

_ , "Social Inheritance and Equal Opportunity Policies," *Maintaining Momentum*, 2005, pp. 14–30.

Farre, Lidia and Francis Vella, "The Intergenerational Transmission of Gender Role Attitudes and its Implications for Female Labour Force Participation," *Economica*, 2013, *80*, 219–247.

Fenger, H.J.M., "Welfare Regimes in Central and Eastern Europe: incorporating post-communist countries in a welfare regime typology," *Contemporary Issues and Ideas in Social Sciences*, 2007, *3* (2).

Ferrera, Maurizio, "The Southern Model of Welfare State in Social Europe," *Journal of European Social Policy*, 1996, *6* (1), 17–37.

Fessler, Pirmin and Alyssa Schneebaum, "Gender and Educational Attainment Across Generations in Austria," *Feminist Economics*, 2012, *18* (1), 161–188.

_ **, Martin Schürz, and Peter Mooslechner**, "Intergenerational Transmission of Educational Attainment in Austria," *Empirica*, 2012, *39* (1), 65–86.

Galton, Francis, *Hereditary Genius: An Inquiry into its Laws and Consequences*, Macmillan, 1869.

_ , *Natural Inheritance*, Macmillan, 1889.

Gang, Ira N. and Klaus F. Zimmermann, "Is Child Like Parent? Educational Attainment and Ethnic Origin," *The Journal of Human Resources*, 2000, *35* (3), 550–569.

Green, Andy, "The Reform of post-16 education and training and the lessons from Europe," *Journal of Education Policy*, 1991, *6* (3), 327–339.

Haveman, Robert and Barbara Wolfe, "The Determinants of Children's Attainments: A Review of Methods and Findings," *Journal of Economic Literature*, 1995, *33* (4), 1829–1878.

Heckman, James J., "Schools, Skills, and Synapses," Technical Report 3515, IZA Discussion Paper July 2008.

Hertz, Tom, Tamara Jayasundera, Patrizio Piraino, Sibel Selcuk, Nicole Smith, and Alina Verashchagina, "The Inheritance of Educational Inequality: International Comparisons and Fifty-Year Trends," *The B.E. Journal of Economics Analysis & Policy*, 2007, *7* (2), Article 10.

Hoffmeyer-Zlotnik, Jürgen H.P. and Uwe Warner, "How to Survey Education for Cross-National Comparisons: The Hoffmeyer-Zlotnik/Warner-Matrix of Education," *Metodoloski zvezki*, 2007, *4* (2), 117–148.

Leibowitz, Arlene, "Education and Home Production," *American Economic Review*, 1974, *64* (2), 243–250.

Magnuson, Katherine A., Marcia K. Meyers, Christopher J. Ruhm, and Jane Waldfogel, "Inequality in Preschool Education and School Readiness," *American Educational Research Journal*, 2004, *41* (1), 115–157.

Molina, José Alberto, Mariá Navarro, and Ian Walker, "Intergenerational Well-Being in Europe," *Kyklos*, 2011, *64* (2), 253–270.

Nguyen, Anh, Getinet Haile, and Jim Taylor, "Ethnic and gender differences in intergenerational mobility: a study of 26-year-olds in the USA," *Scottish Journal of Political Economy*, 2005, *52* (4), 544–564.

Norwegian Social Science Data Services, "European Social Survey Round 5 Data," 2010. Data file edition 3.0., Norway – Data Archive and distributor of ESS data.

OECD, "A Family Affair: Intergenerational Social Mobility across OECD Countries," Technical Report Economic Policy Reforms: Going for Growth chapter 5, OECD Publishing 2010.

Peter, Tracey, Jason D. Edgerton, and Lance W. Roberts, "Welfare regimes and educational inequalily: A Cross-National Exploration," *International Studies in Sociology of Education*, 2010, *20* (3), 241–264.

Piketty, Thomas, "Theories of Persistent Inequality and Intergenerational Mobility," in A. B. Atkinson and F. Bourguignon, eds., *Handbook of Income Distribution*, Amsterdam: Elsevier, 2000, pp. 429–476.

Sayer, Liana C., Suzanne M. Bianci, and John P. Robinson, "Are Parents Investing Less in Children? Trends in Mothers' and Fathers' Time with Children," *American Journal of Sociology*, 2004, *110* (1), 1–43.

Schütz, Gabriela, Heinrich W. Ursprung, and Ludger Wößmann, "Education Policy and Equality of Opportunity," *Kyklos*, 2008, *61* (2), 279–308.

Solon, Gary, "Cross-Country Differences in Intergenerational Earnings Mobility," *Journal of Economic Perspectives*, 2002, *16* (3), 59–66.

UNESCO, "ISCED 1997 Mappings," *http://www.uis.unesco.org/Education/ISCEDMappings/Pages/default.aspx*, 2012. Accessed 22 July 2013.

United Nations Development Program, "Human Development Report 2013 - The Rise of the South: Human Progress in a Diverse World," *http://hdr.undp.org/en/media/HDR_2013_EN_complete.pdf*, 2013. Accessed 05 November 2013.

Zick, Cathleen, W. Keith Bryant, and Eva Österbacka, "Mothers' Employment, Parental Involvement, and the Implications for Intermediate Child Outcomes," *Social Science Research*, 2001, *30*, 25–49.

Tables and Figures

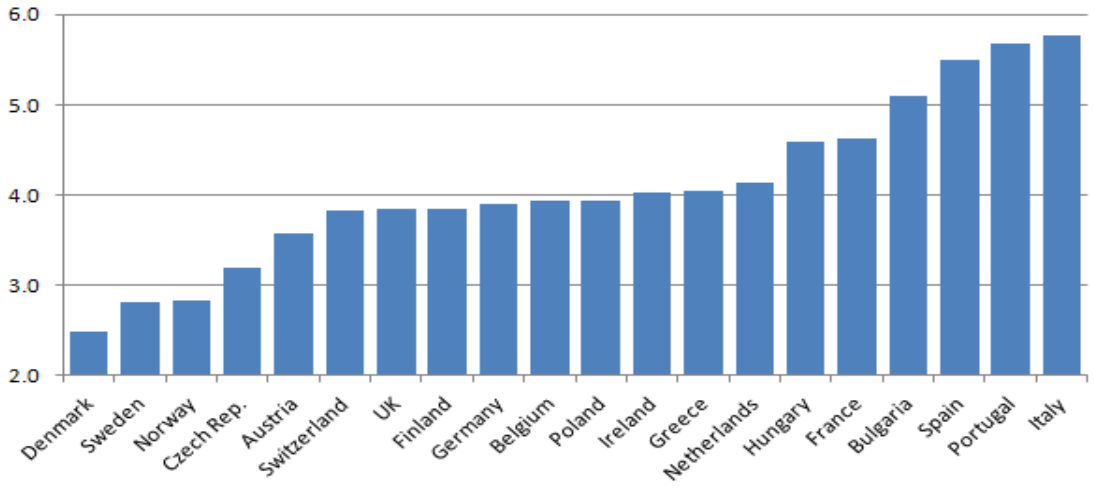


Figure 1a: Unconditional educational premium (in years) for descendants of high versus low educated parents, by country

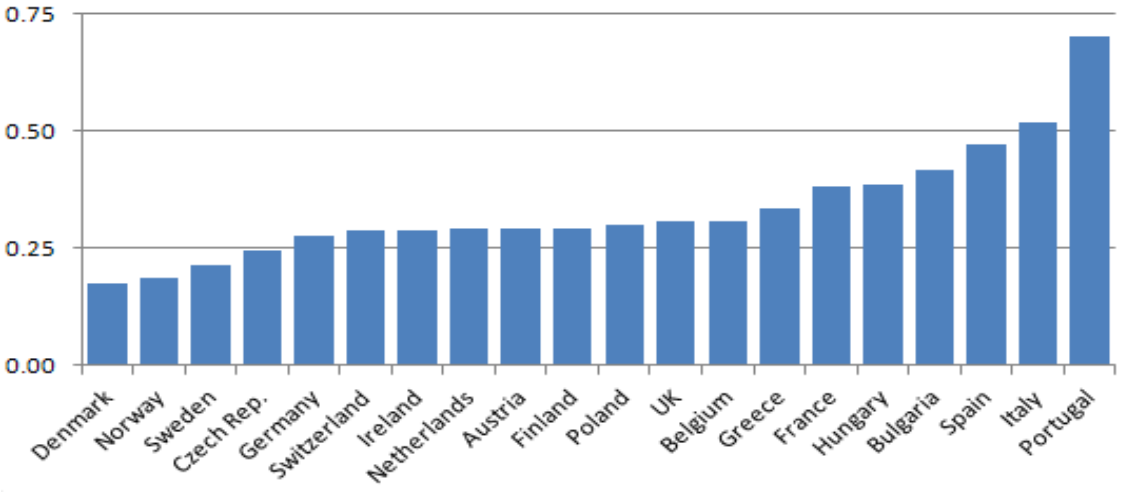


Figure 1b: Educational premium (in years) relative to country educational averages for descendants of high versus low educated parents

Table 1: Descriptives Statistics on Educational Attainment, Respondents Aged 25-65

Country		Sample Size	Average Years	Standard Deviation
All	Male Descendants	11291	12.71	3.56
	Female Descendants	12424	12.66	3.61
	Fathers	23715	9.49	4.42
	Mothers	23715	8.94***	4.19
Austria	Male Descendants	672	12.32	2.29
	Female Descendants	769	12.18	2.39
	Fathers	1441	11.08	2.69
	Mothers	1441	10.12	2.62
Belgium	Male Descendants	472	12.56	3.32
	Female Descendants	531	12.82	3.08
	Fathers	1003	9.57	4.27
	Mothers	1003	8.93***	4.01
Bulgaria	Male Descendants	677	11.96	3.29
	Female Descendants	814	12.33*	3.62
	Fathers	1491	9.55	3.78
	Mothers	1491	9.35***	3.96
Czech Republic	Male Descendants	831	12.87	2.01
	Female Descendants	794	13.03	2.03
	Fathers	1625	12.21	2.22
	Mothers	1625	11.73***	2.26
Denmark	Male Descendants	502	14.24	3.08
	Female Descendants	487	14.33	2.92
	Fathers	989	10.29	4.11
	Mothers	989	10.54**	4.22
Finland	Male Descendants	605	12.76	4.11
	Female Descendants	569	13.45***	3.48
	Fathers	1174	8.25	5.36
	Mothers	1174	8.15	4.91
France	Male Descendants	476	11.89	3.43
	Female Descendants	543	12.28*	3.30
	Fathers	1019	8.15	4.11
	Mothers	1019	7.27***	3.69
Germany	Male Descendants	885	14.24	2.45
	Female Descendants	884	13.77***	2.59
	Fathers	1769	12.85	2.82
	Mothers	1769	11.55***	2.69
Greece	Male Descendants	574	12.19	3.53
	Female Descendants	789	11.97	3.37
	Fathers	1363	5.81	3.97
	Mothers	1363	5.06***	3.45
Hungary	Male Descendants	477	11.75	2.85
	Female Descendants	538	12.13**	3.02
	Fathers	1015	9.60	3.57
	Mothers	1015	9.04***	3.46

Continued on next page...

Table 1: continued

Country		Sample Size	Average Years	Standard Deviation
Ireland	Male Descendants	691	13.84	3.33
	Female Descendants	854	13.95	3.21
	Fathers	1545	9.86	3.92
	Mothers	1545	10.19***	3.73
Italy	Male Descendants	496	11.31	4.12
	Female Descendants	521	10.94	4.26
	Fathers	1017	7.41	3.68
	Mothers	1017	6.69***	3.00
Netherlands	Male Descendants	503	14.71	3.94
	Female Descendants	635	13.89***	3.70
	Fathers	1138	11.35	4.12
	Mothers	1138	9.99***	3.18
Norway	Male Descendants	540	15.05	2.60
	Female Descendants	466	15.08	2.70
	Fathers	1006	12.72	3.64
	Mothers	1006	11.89***	3.39
Poland	Male Descendants	534	12.77	2.59
	Female Descendants	548	13.47***	2.67
	Fathers	1082	10.34	3.23
	Mothers	1082	10.28	3.24
Portugal	Male Descendants	458	8.35	4.40
	Female Descendants	653	7.92	4.41
	Fathers	1111	3.91	3.25
	Mothers	1111	3.45***	3.26
Spain	Male Descendants	620	11.62	4.45
	Female Descendants	614	11.74	4.58
	Fathers	1234	6.79	4.99
	Mothers	1234	5.94***	4.37
Sweden	Male Descendants	388	12.75	2.55
	Female Descendants	416	13.18**	2.74
	Fathers	804	9.39	4.14
	Mothers	804	9.46	3.90
Switzerland	Male Descendants	477	13.40	2.88
	Female Descendants	451	13.10	3.15
	Fathers	928	11.43	3.70
	Mothers	928	10.05***	3.29
United Kingdom	Male Descendants	413	12.38	3.81
	Female Descendants	548	12.46	3.60
	Fathers	961	9.52	4.03
	Mothers	961	9.03***	3.53

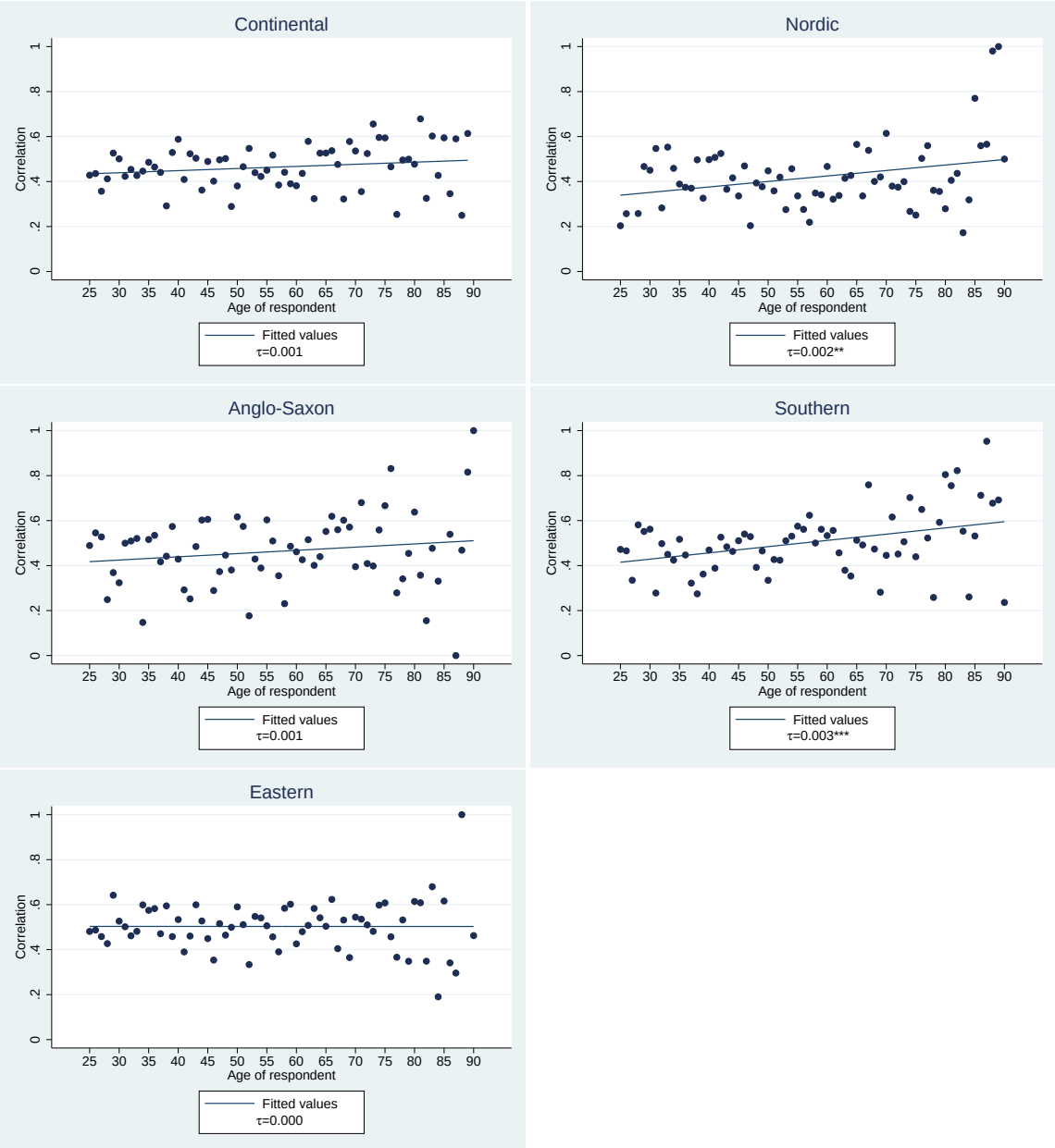
Notes: Authors' calculations on weighted ESS data. Statistically significant differences in means for men versus women and mothers versus fathers are indicated with ***($p<.01$), **($p<.05$), or *($p<.10$).

Table 2: Intergenerational Educational Correlations - Respondents aged 25-65

Country	N men	N women	All parents - All descendants	Father-Son	Father-Daughter	Mother-Son	Mother-Daughter	Female
Continental	**3485**	**3813**	**0.478**	**0.323**	**0.292**	**0.178**	**0.269**	**-0.30**
Austria	672	769	0.485	0.321	0.277	0.160	0.324	-0.51
Belgium	472	531	0.570	0.343	0.360	0.314	0.227	0.22
France	476	543	0.485	0.307	0.238	0.247	0.276	0.17
Germany	885	884	0.412	0.388	0.277	0.017	0.239	-0.60
Netherlands	503	635	0.468	0.328	0.334	0.150	0.222	-0.44
Switzerland	477	451	0.447	0.252	0.267	0.181	0.326	-0.65
Nordic	**2035**	**1938**	**0.433**	**0.308**	**0.196**	**0.185**	**0.268**	**0.17**
Denmark	502	487	0.406	0.275	0.195	0.185	0.267	0.05
Finland	605	569	0.422	0.265	0.186	0.240	0.232	0.32
Norway	540	466	0.454	0.419	0.174	0.107	0.313	0.16
Sweden	388	416	0.449	0.275	0.229	0.209	0.262	0.15
Anglo-Saxon	**1104**	**1402**	**0.490**	**0.285**	**0.231**	**0.225**	**0.326**	**-0.11**
Ireland	691	854	0.519	0.313	0.176	0.208	0.417	-0.15
UK	413	548	0.461	0.257	0.286	0.241	0.236	-0.07
Southern	**2148**	**2577**	**0.517**	**0.361**	**0.301**	**0.175**	**0.282**	**-0.13**
Greece	574	789	0.425	0.405	0.220	0.075	0.230	-0.04
Italy	496	521	0.503	0.329	0.399	0.153	0.212	-0.33
Portugal	458	653	0.553	0.244	0.257	0.314	0.383	-0.14
Spain	620	614	0.588	0.469	0.326	0.157	0.301	0.01
Eastern	**2519**	**2694**	**0.520**	**0.357**	**0.245**	**0.185**	**0.335**	**0.08**
Bulgaria	677	814	0.620	0.417	0.266	0.207	0.404	-0.01
Czech Rep.	831	794	0.400	0.335	0.201	0.120	0.245	0.16
Hungary	477	538	0.532	0.353	0.302	0.192	0.305	0.01
Poland	534	548	0.527	0.325	0.210	0.222	0.386	0.18
Total	11291	12424	0.486	0.331	0.259	0.185	0.290	-0.08

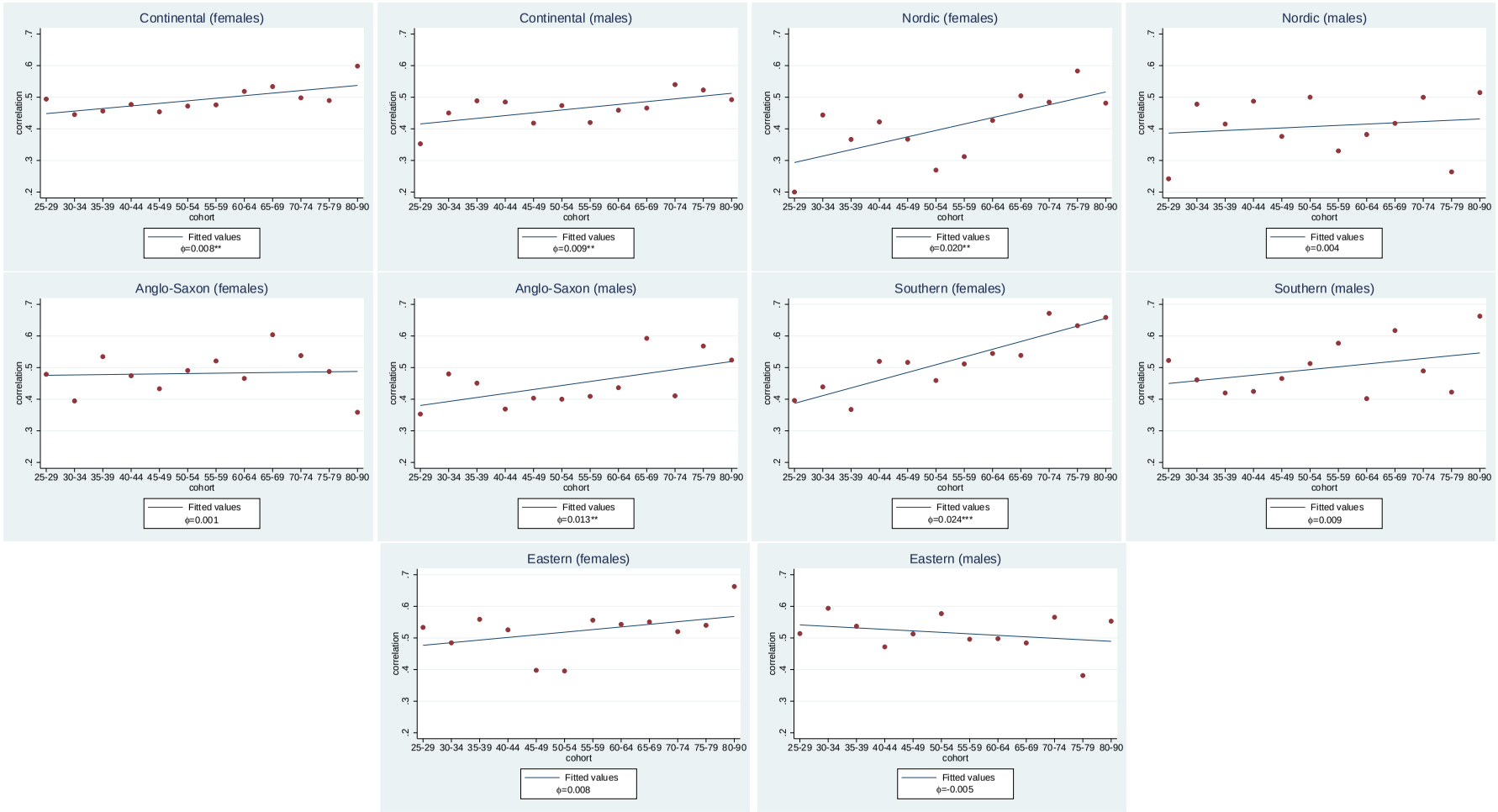
Notes: Authors' calculations on survey weighted 2010 European Social Survey data.

Figure 2: Educational correlations over age of descendants (25–90 years) by country clusters[a]



[a]Four outliers (with negative correlations) in the dataset were left out of this analysis. There are people aged 90 in the Continental cluster (γ=-0.346); aged 89 in the Eastern cluster (γ=-0.500); aged 85 in the Anglo-Saxon cluster (γ=-0.247); and aged 27 in the Nordic cluster (γ=-0.032).

Figure 3: Educational correlations by country clusters, 5–year age cohorts, and gender[a]



[a]These cluster correlations are the averages of the country–level correlations for each 5–year age cohort for men and women (separately) in a country–cluster

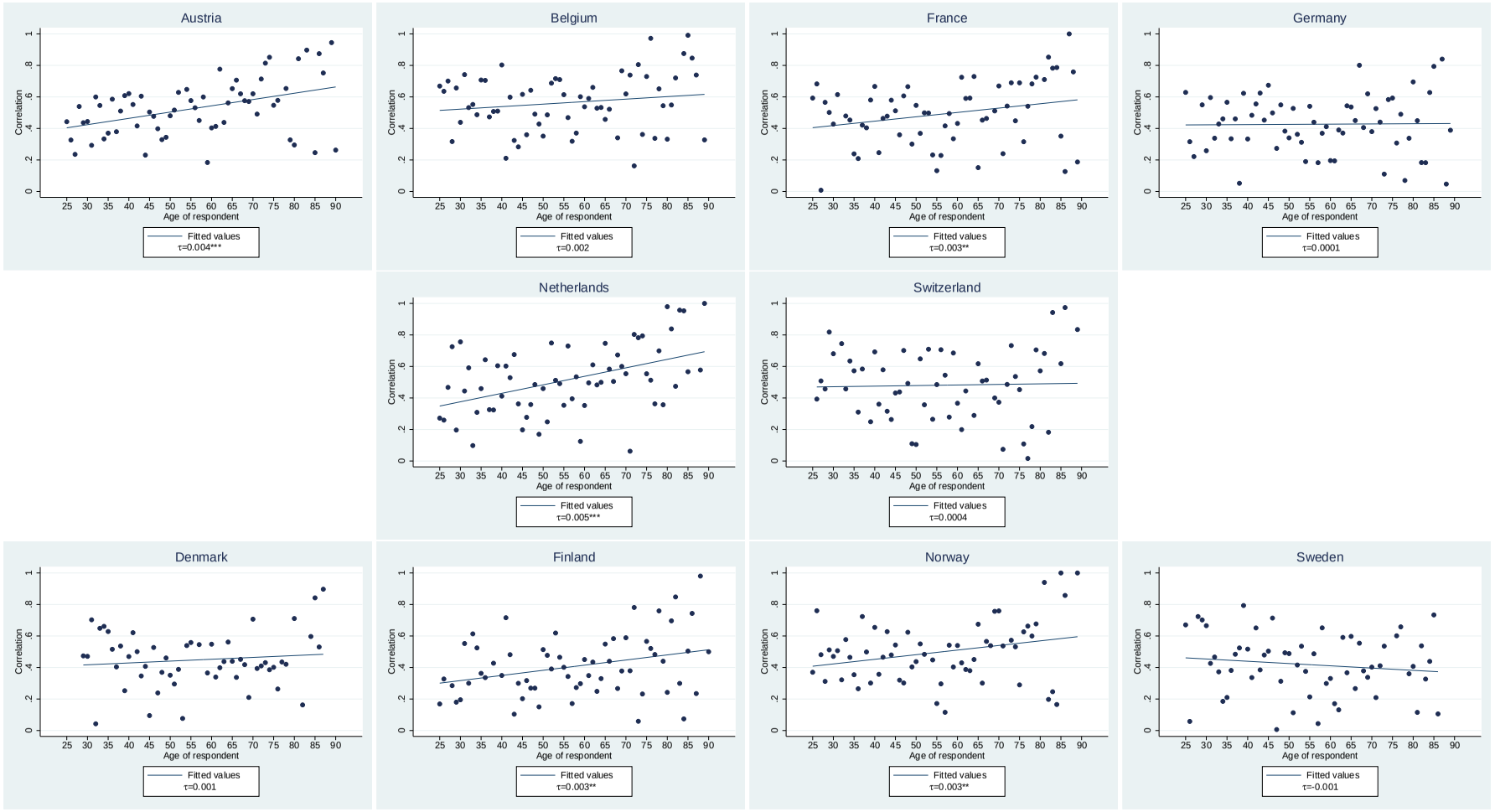
A Appendix

Table A.1: Intergenerational Educational Elasticities - Respondents aged 25-65

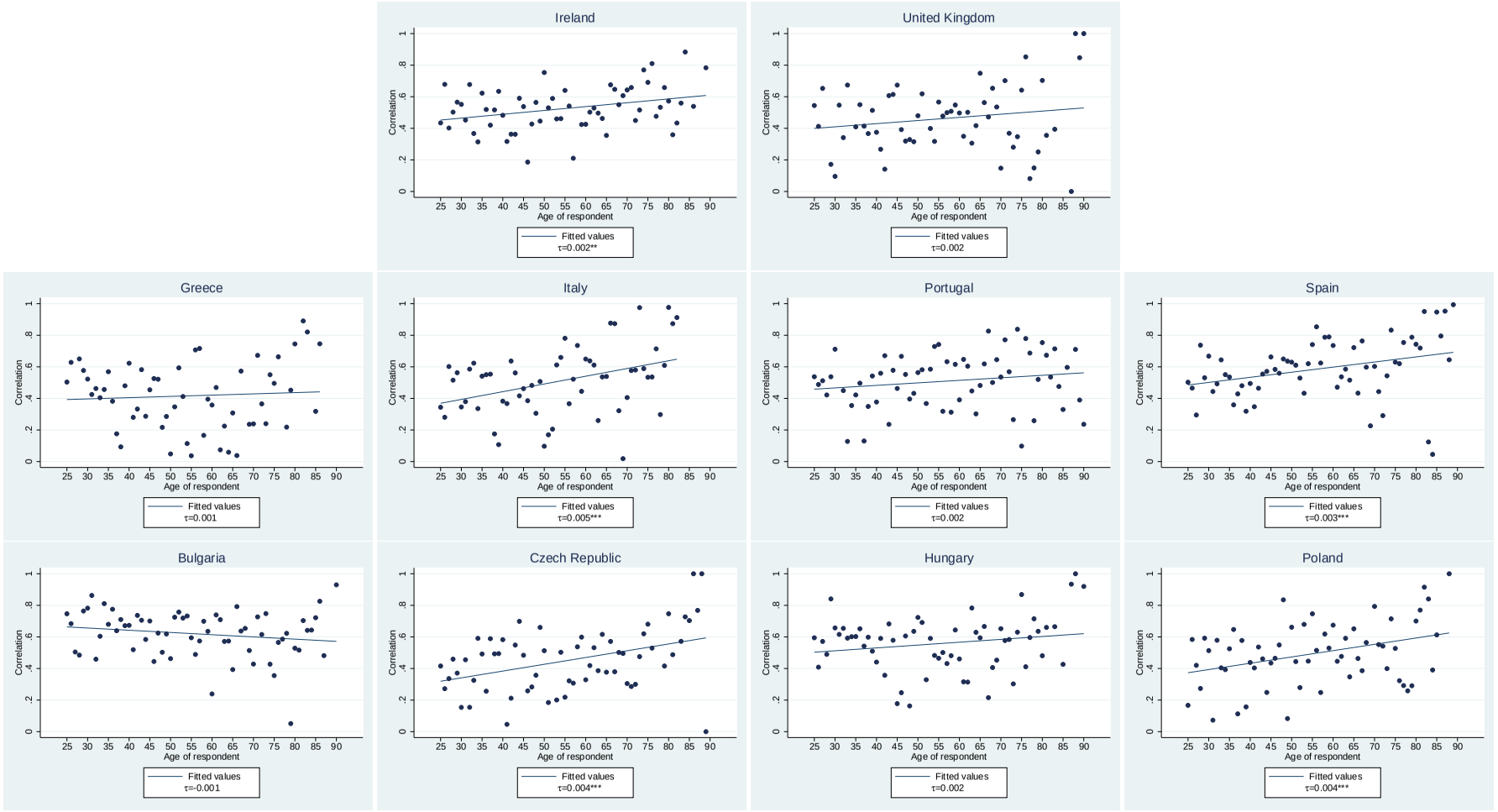
Country	N men	N women	All parents - All descendants	Father-Son	Father-Daughter	Mother-Son	Mother-Daughter	Female
Continental	**3485**	**3813**	**0.471**	**0.275**	**0.247**	**0.163**	**0.252**	**-0.85**
Austria	672	769	0.475	0.281	0.242	0.143	0.290	-1.19
Belgium	472	531	0.481	0.257	0.269	0.250	0.181	0.71
France	476	543	0.460	0.251	0.195	0.225	0.251	0.59
Germany	885	884	0.428	0.348	0.248	0.016	0.224	-1.53
Netherlands	503	635	0.550	0.306	0.310	0.180	0.266	-1.69
Switzerland	477	451	0.433	0.206	0.218	0.166	0.300	-1.96
Nordic	**2035**	**1938**	**0.345**	**0.218**	**0.137**	**0.136**	**0.198**	**0.55**
Denmark	502	487	0.332	0.200	0.142	0.131	0.190	0.15
Finland	605	569	0.345	0.190	0.133	0.187	0.181	1.22
Norway	540	466	0.380	0.304	0.126	0.083	0.244	0.43
Sweden	388	416	0.321	0.176	0.147	0.143	0.178	0.39
Anglo-Saxon	**1104**	**1402**	**0.488**	**0.248**	**0.204**	**0.217**	**0.306**	**-0.38**
Ireland	691	854	0.478	0.260	0.146	0.182	0.365	-0.50
UK	413	548	0.499	0.235	0.262	0.252	0.247	-0.26
Southern	**2148**	**2577**	**0.636**	**0.370**	**0.322**	**0.218**	**0.338**	**-0.52**
Greece	574	789	0.431	0.350	0.190	0.074	0.229	-0.15
Italy	496	521	0.684	0.374	0.455	0.214	0.296	-1.38
Portugal	458	653	0.820	0.331	0.349	0.423	0.517	-0.60
Spain	620	614	0.608	0.424	0.295	0.162	0.311	0.03
Eastern	**2519**	**2694**	**0.484**	**0.312**	**0.212**	**0.159**	**0.287**	**0.20**
Bulgaria	677	814	0.586	0.383	0.244	0.182	0.354	-0.04
Czech Rep.	831	794	0.408	0.305	0.183	0.108	0.219	0.33
Hungary	477	538	0.484	0.292	0.250	0.164	0.260	0.03
Poland	534	548	0.459	0.267	0.173	0.182	0.316	0.47
Total	11291	12424	0.483	0.287	0.229	0.173	0.271	-0.25

Notes: Authors' calculations on weighted 2010 European Social Survey data.

Figure A.1: Educational correlations over age of descendants (25-90 years), by country and age years; continued on next page [a]



[a] Outliers with negative values have not been included in these calculations; most countries are missing some correlations, especially for those aged 80 or above


Ireland
Correlation
Age of respondent
Fitted values
τ=0.002**
United Kingdom
Correlation
Age of respondent
Fitted values
τ=0.002
Greece
Correlation
Age of respondent
Fitted values
τ=0.001
Italy
Correlation
Age of respondent
Fitted values
τ=0.005***
Portugal
Correlation
Age of respondent
Fitted values
τ=0.002
Spain
Correlation
Age of respondent
Fitted values
τ=0.003***
Bulgaria
Correlation
Age of respondent
Fitted values
τ=-0.001
Czech Republic
Correlation
Age of respondent
Fitted values
τ=0.004***
Hungary
Correlation
Age of respondent
Fitted values
τ=0.002
Poland
Correlation
Age of respondent
Fitted values
τ=0.004***