Where Do Youth Follow in their Parents' Footsteps?
The College-Going Outcomes of Adults in 19 European Nations

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Abstract: This paper estimates the probability of adults becoming college-educated, contingent on the college-educated status of a parent, based on data from nineteen different European nations. The study's purpose is to quantify differences across Europe in the extent to which higher education is equally available to those with different socioeconomic background markers. It also conducts a preliminary exploration into factors that might account for the cross-national variation observed. The results show that over the last several decades, the intergenerational transmission of college status has weakened substantially across almost all nineteen countries. Assessing the college-going outcomes of the most recent cohort of college graduates (those born between 1971 and 1989) reveals that the association between this generation's college status and that of their parents varies considerably across nations. It is lowest in Scandinavian countries, and largest in select eastern and southern European nations. Examining possible reasons for these differences, we do not find cross-national evidence that the size of public subsidies to higher education, the numbers gaining a vocational degree in secondary education, or socioeconomic-based differences in cognitive skills matter much. We do find, however, that parental background is most strongly associated with young adult's college-going outcomes in countries with lower rates of college enrollment. The significant role that we find for enrollment levels both over time and across countries, coupled with the large size of the college-going population in many countries today, suggest that an increased focus on who gains advanced degrees may be warranted.

Key Words: Higher education, educational mobility

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1. Introduction

In virtually every society, parents' socioeconomic economic status helps predict their children's educational achievements. Education and social policies seek to reduce this intergenerational association, as increasing social mobility and encouraging human capital accumulation hinges on equaling youth's educational opportunities.

This paper develops a particular indicator of the degree of association between parents and their children's outcomes across a range of European countries. Using data from the European Social Survey (ESS), it examines the college-going outcomes of young adults in nineteen European countries by estimating the relative probability of someone obtaining a college degree based on whether or not his or her parent is college-educated. The paper's purpose is to quantify differences across Europe in the strength of association between the attainment of a college degree and socioeconomic status. The paper then investigates factors that might account for cross-national variation in how strong this relationship is.

Examining trends over time shows that the intergenerational transmission of college status has weakened substantially over the last several decades. Turning to the most recent generation of young adults (those born in the 1970s and 1980s), the paper uncovers noticeable variation across nations in the relationship between this generation's and their parent's college status. The relationship is weakest in Scandinavian countries, and strongest in select eastern and southern European nations. The paper explores several hypotheses to explain this variation: that the association is stronger in countries relying more on private versus public funds; where vocational, non-academic tracks are more common; and where there is a more robust link between family background and the acquisition of cognitive skills up through secondary education.

An exploratory investigation into these country-level features reveals little evidence that cross-national patterns in them align with cross-national differences in educational mobility. What we do find, however, is strong evidence that parents' college-going status is more closely associated with their children's when a lower percentage of young adults obtain a college degree. Increasing access to higher education, therefore, might prove the most effective way of improving intergenerational educational mobility.

2. Background

All countries exhibit a positive correlation between the socioeconomic status of children and their parents. The strength of this correlation is important as nations aspire to the ideal of providing equal opportunity for all its citizens, independent of family background. While relatively rare, comparisons across countries of intergenerational mobility provide additional meaning to within-country measures, and help to evaluate whether country-specific institutions and policies enhance or restrict social mobility.

The most common way to measure the intergenerational persistence of social status is by measuring the association between parents' and their children's income, wealth, or occupation (Aaronson and Mazumder 2007, Beller and Hout 2006). Recently, researchers have begun investigating the intergenerational transmission of educational outcomes (Kirchsteiger and Sebald 2010, Hertz et al 2007, Black, Devereux and Salvanes 2005), a focus attributable to

education's growing influence on income and other important life outcomes. Education is also of particular interest because of its key role in macroeconomic performance (Hanushek 2015). In countries where parents' education more strongly conditions the human capital acquisition of their children, one would accordingly expect to find lower productivity and reduced social mobility.

Many studies investigate intergenerational educational mobility over time within a particular country. These tend to focus on teasing out the role of parents' educational attainment per se from other factors correlated with education (Holmlund, Lindahl and Plug 2011). The results offer mixed results. Many find that some of the correlation is explained by genetic differences (Holmlund et al); but many studies also point to the role education policy can play in weakening the association (Lundborg, Nilsson and Rooth 2014; Aakvik, Salvanes and Vaage; Oreopoulos 2006; Meghir and Palme 2005).

Cross national studies seek foremost to quantify differences across countries, and secondarily to offer explanations of those differences. The few studies that exist find fairly large differences across nations. In their especially exhaustive study, Hertz and colleagues (2007) calculate correlation coefficients and regression coefficients for children's years of study regressed against that of their parents' in 42 different countries. Both measures reveal significant cross-national differences in the intergenerational transmission of educational attainment. Within the western world, for example, parents' years of education explains anywhere from 30 to 50 percent of the years of education attained by their children, estimates slightly larger than Couch and Dunn (1997) find in their study of the US and Germany.

A few studies measure "education attainment" not by years of study, but by discrete attainment categories. One advantage of this approach is that years of schooling may have diverse interpretations in different school systems. Another is that the relationship between parents' and their children's educational attainment may not be linear nor uniform across educational levels. Chevalier et al (2009) group educational attainment into five discrete categories based on a widely used international classification system. They then measure the intergenerational persistence of educational attainment in different countries by calculating Eigen values (the speed at which original educational attainment disappears over subsequent generations). The differences between countries that they find are broadly consistent with those found in Hertz (see Blandon 2009).

In this paper we develop a third indicator of the association between parents' and children's educational attainment by focusing on a single educational outcome: whether or not someone gains a college degree.[1] This particular attainment level is of special interest because the returns to education are increasingly nonlinear (OECD 2006), and whether or not someone attains a college degree has special economic and social implications.[2] Moreover, college enrollments are rapidly increasing, with around 40 percent or more of young adults becoming college-educated in many European nations. And the decision to attend college is both optional and expensive, factors that might make family background more influential than it is at other decisions points in one's formal education. Examining the probability of one

[1] The precise outcome examined is obtaining a college degree, which is not the same as attending college, especially in countries with high college drop-out rates. For ease of prose, however, the paper uses the two terms interchangeably, while always meaning the outcome of acquiring a college degree.

[2] Another educational outcome of particular relevance is the failure to complete secondary education, a topic meriting a separate investigation.

particular educational outcome has a final advantage in that the measures presented—the relative probability of attaining a college degree--have a straightforward interpretation.

3. Data and Methods

Data. To develop country-level estimates of the association between young adults and their parents' college status, the paper uses European Social Survey (ESS) data. The ESS is a biennial cross-national survey given to random samples of each nation's 15 year-old and older population. Begun in 2002, the ESS now contains seven waves of data on the attitudes, beliefs, behavioral patterns, and socioeconomic outcomes (including educational attainment) of individuals in 30 countries. Beginning with wave 4 (2008) or 5 (2010), depending upon the country, ESS also collects information on the educational attainment of each respondent's parents.

This study examines data from the nineteen European nations that regularly participate in the ESS. Because of the relatively small number of people in each wave (typically around 2,000), we combine the waves containing information on both the respondents' and their parents' educational attainment. As Table 1 details, this means combining waves 4 through 7 (2008-2014) in 12 countries,[3] waves 5 through 7 (2010-2014) in another five, [4] and waves 4 through 6 in two countries.[5]

Table 1 Here

For each country data set, we wish to identify the most recent subset of individuals whose college status has been determined. We thus select "young adults", which we define as those who were between the ages of 25 and 35 when interviewed (depending on the country, this means they were born between 1971 and 1989). For the purposes of comparing this group of young adults with an older cohort, we also identify a group of "older adults", which we identify as those who were between the ages of 50 and 60 when surveyed (i.e., born between 1946 and 1964). Each of these two age cohorts make up roughly 15 to 20 percent of the entire surveyed population, and we limit our paper's analyses to these two cohorts: both are used to assess trends over time, and the younger cohort is used to compare the characteristics of those who gain a college degree across time.

Table 1 presents the sample size and summary characteristics of these two cohorts; for simplicity we refer to the younger cohort as Generation 2, and the older one as Generation 1. ESS assigns each individual a design weight (*dweight*) because not all individuals are equally likely to participate in the ESS survey, and design weights correct for possible sample selection bias. All estimates in this paper employ these design weights.

ESS collects information on the educational attainment of each surveyed individual as well as each of their parents. We identify a person as "college educated" if their educational

[3] Norway, Denmark, Belgium, Spain, Hungary, Portugal Germany, Netherlands, the Czech Republic, Poland, Slovenia and France.
[4] Sweden, Finland, Estonia, UK and Ireland
[5] At the time of this paper, wave 7 was not yet available for the Slovak Republic and the Ukraine.

attainment is above ISCED level 5.[6] ISCED stands for the International Standard Classification of Education, and is the most common classification system equating educational attainment levels across different national categorization schemes.

Method. For each country, we wish to quantify the strength of association between a parent's and their children's college-going status. The property of interest among both parents and their children (whether or not they earned a college degree) are either present or not. Estimating the probability of children earning a college degree given their parents' educational status can be accomplished in one of three ways: by calculating an odds ratio, a risk ratio, or by calculating an absolute risk reduction. While the odds ratio is a common way to measure the impact of some factor on a probabilistic outcome, the ratio is also difficult to interpret, and is frequently mistakenly interpreted as the risk ratio. Generally it is the risk ratio that is of greater interest to practitioners. This is the relative risk of an event occurring when some risk factor is present, divided by the risk of the event occurring when the risk factor is not present. In the present context, the event of interest is earning a college degree, and the *risk factor* is a parent having a college degree. In this instance, referring to this ratio as relative risk can be misleading, and we instead choose to term it relative probability:

(1) Relative Probability= (Probability of college degree for those with a college-educated parent)/ (Probability of college degree for those without a college-educated parent).

In words, the relative probability tells us how by how much the probable it is for someone with a college educated parent to gain a college degree, than is someone without a college-educated parent. A ratio of two would tell us that on average, the former are twice as likely themselves to become college-educated, than are those in the latter group. It thus provides an indicator of the degree of educational mobility in a country. In countries with higher relative probabilities, college attainment is more closely associated with the attainment of their parents.

To calculate relative probabilities, we begin with logit regressions to estimate the relationship between parents' college outcomes (the independent variable) and those of their children (the dependent variable). Independent variables include each respondent's gender, and the college status of both their mother and father. As detailed below, we then use these results to calculate the probability of obtaining a college degree for those with different family backgrounds. These probabilities are then used to calculate (following (1) above) relative probabilities.

For the purposes of this study, we focus on the aggregate association between parents' and their children's educational attainment,[7] without teasing out the precise role per se played by parents' education. It is certain that cross-national differences exist in the characteristics of individuals and families with and without college degrees. Table 1, for instance, shows that the percent of the population that is foreign born, whose parents were foreign born, or who self-identify as a member of a minority group varies in each country. Interpreting differences in relative probabilities across nations should take account of country-specific differences in the pool of individuals distinguished by the presence or absence of a college degree, a topic

[6] In ESS, this is represented by the variable *eisced*. We identify someone as college educated if this variable is above 5 but below 10.

[7] In almost all countries, more detailed specifications conditioning probabilities on whether the individual is born in the country, whether his or her parents were born in the country, and whether he or she is a self-identified member of a minority group indicate that these variables are generally statistically insignificant.

we return to later. But our main interest here is in measuring aggregate associations, and later in the paper exploring whether variation among countries can be tied to policy differences among them. With this caveat, we present in Table 2 the estimated logit coefficients for the two cohorts (Gen 1 and Gen 2, analyzed separately) in each of the 19 countries from the logistic regressions described above.

Table 2 Here

After obtaining these regression coefficients, the next step is to use them to calculate the probability that individuals with given background characteristics (gender, parents' college status) obtain a college degree (P_i). To do this, we take the ß coefficients from the logistic regressions (Table 2), and calculate the probability as follows (Long 1997):

$$(2)\ P_i = \frac{\exp(ß_0 + ß_1 M_i + ß_2 FC_i + ß_3 MC_i)}{1 + \exp(ß_0 + ß_1 Mi + ß_2 FC_i + ß_3 MC_i)},$$

where M is a male dummy, FC is a dummy that takes the value of 1 if the father has a college degree and MC is a dummy that takes the value of 1 if the mother has a college degree. The subscript i captures the total number of ways these three characteristics of individuals can be combined. To illustrate, the probability of one combination, a female gaining a college degree when her father and mother did not (M, FC, MC all equal 0), is calculated as:

$$(3)\ P = \frac{\exp(ß_0)}{1 + \exp(ß_0)}.$$

4. Results

Cross National Comparison of Generations 1 and 2

We first examine changes in the strength of association between the college status of parents and children over time. While the college status of ESS respondents is fairly straightforward, how one categorizes the college status of respondents' parents involves choice as we have information on two parents. For purposes of this study, we define "having a college educated parent" as occurring when the respondent has a college-educated father but not mother. Not having a college educated parent thus means neither parents has a college degree. This choice is somewhat arbitrary, and later we return to discussing it.

Table 3 presents separate calculations of the probability of college completion by gender based on equation (1) above, for individuals with a college-educated father but not mother (columns 1-2 and 5-6), and for those without a college-educated parent (columns 3-4 and 7-8). Calculations are presented separately for Generation 1 and Generation 2.

First, we examine changes over time in the probability of attending college. Examining females first, we see that in almost all countries, the probability of a female attending college rose significantly between Generation 1 and Generation 2, regardless of whether her father attended college or not. The probability also increased significantly for males without a college-educated father, although for those with one, the probability of them earning a college degree changed little. Indeed, the unweighted average of the probability of a young man with

a college educated father earning a college degree in the 19 countries actually declined from 56 to 51 percent.

Table 3 here

The last four columns in Table 3 present the *relative* probability of attending college for each generation and gender. Recall this is the probability of those with a college-educated father attending college, divided by the probability of those without a college-education father attending college (equation (1)). A value of 1 suggests that college completion rates are equal across socioeconomic groups, while 2 indicates that those with a college-educated father are twice as likely as those without to gain a college degree. For instance, Generation 2 males in Norway were 1.95 times more likely to attend college if their father was college-educated (see column 9 row 1), than if their father was not. From now on, these relative probabilities (specifically columns 9 and 12) are used as measures of the strength of association between parents' and their children's college-going outcomes.[8]

Figures 1 and 2 present a graphical representation of trends in these relative probabilities within each country by comparing the relative probability among Generation 1 and Generation 2 cohorts. Figure 1 shows trends for males and Figure 2, females. As can be seen, the importance of a father's college status as a predictor of their children's college attendance status has declined noticeably over time. This finding is consistent with the conclusions reached by others that the intergenerational transmission of educational status has weakened over time (Ranisinghe 2015, Hertz et al 2006, Fessler and Schneebaum 2012). Perhaps not surprisingly, improvements in educational mobility (declines in the ratio) were strongest in countries with larger expansions in access to higher education: the size of this decline (see Table 3) has a -.4 correlation with increases in the size of the college going population (see Table 1). Thus, the degree to which college attendance has grown over the last several decades across many European countries helps account for the degree to which the significance of parents' college status on who attends college today has declined within them.

Figures 1 and 2 here

Cross National Comparisons of Generation 2

We turn now to examining in greater detail the college-going outcomes of the Generation 2 cohort in the different countries. As shown in Table 3 and Figures 1 and 2, the degree to which the presence of a college-educated father improves the likelihood of this cohort earning a college degree varies across nations. Males in Norway with a college-educated father were 1.95 times more likely to complete college than were those without a college-educated father. In Sweden the ratio is a low 1.18, while in Hungary and Spain it is a high 4.5 and 3.3 respectively. Figure 3 displays this variation among both females and males in the 19 countries.

Figure 3 here

[8] One could similarly use differences in probabilities rather than the ratio, a topic we take up in the discussion section.

Why is family background more closely associated with who attends college in some countries but not others?[9] One possible reason is that countries differ in their incentives to attend college. The net benefit of acquiring a degree differs significantly across nations (van Damme 2014, OECD 2014). In their comparison of Italy and the US, Checchi et al (1996) found that family background mattered less for youth's educational attainment in the US. They hypothesize that this is due to the larger returns to education in the US, leading to differences "in the incentives to human capital investment" (p. 21). They hypothesize that because education is a less important route to upward economic mobility in Italy, college attendance reflects non-economic preferences rather than economic motives, preferences influenced by family background.

Many hypothesize that parents' background plays a larger role in college-going decisions when attending college is more costly. Extensive research in the US has examined the effect tuition payments and financial aid have on college-going decisions, although the results of this research have been mixed. If the direct costs of college serve as a barrier to college for youth from more disadvantaged socioeconomic backgrounds, then we might expect to find greater levels of intergenerational persistence in college-going decisions where private households pay a greater share of the cost of attending college. Kirchsteiger and Sebald's (2010) model of the intergenerational persistence of educational levels in fact predicts that more subsidies to higher education will weaken the association—as will extending the period of compulsory education, as discussed next.

Figure 4 visually displays the relationship between a reliance on public expenditures to fund higher education (expressed as a percentage of total expenditures), and the relative probability of college attendance for males with and without a college-educated father (Table 4). As can be seen, countries that place more financial burden on private households have college-going outcomes more closely associated with fathers' educational attainment.

Table 4 here

Figure 4 here

Cross national variation in the intergenerational persistence of college-going status could additionally arise from differences in the quality of education that children from different socioeconomic backgrounds acquire. For instance, several studies show that lengthening the period of compulsory education weakens the link between educational attainment and family background (Lundborg, Nilsson and Rooth 2014; Aakvik, Salvanes and Vaage; Oreopoulos 2006; Meghir and Palme 2005). While the period of compulsory education is now fairly standard across European countries, a general point is that different policy choices--such as the way schools are funded, the curricular options available to students, and the degree to which national exams are relied upon—could alter the distribution of human capital among its country's youth.[10] Studies of international test scores inform us that countries differ in the degree to which socioeconomic background conditions the cognitive skill of a country's youth (OECD, Woessmann, Baird).

[9] As evident in Figure 3, the relative probability generally is slightly lower for females than males, although the correlation between the two sexes is very high (.92). For this reason, while we present graphs for males below, those for females are nearly identical.

[10] A body of research in the United States, for instance, underscores the importance of students' course selection and requirements on both their cognitive skills and their subsequent college-going decisions (citations).

Results from PISA test scores provide one way to measure such differences across countries. All of those taking the PISA test provide background information on themselves; test scores can then be matched with indicators of socioeconomic status. One calculation made by PISA officials is the degree to which students' socioeconomic markers explain variation in test scores within the nation. Typically, family background explains less than 10 percent of this variation in Scandinavian countries, while it explains more elsewhere (see Table 4). Figure 5 displays the relationship between the size of this explanatory power, and the relative probability of attending college. As a second indicator, Figure 5 presents the absolute differences in PISA science scores between those with high versus low socioeconomic markets. As both figures show, there is some correlation between the role family background plays in the acquisition of cognitive skills, and the importance of family background in explaining who attains a college degree.

Figure 5

Another reason why countries may differ in the degree to which family background influences the decision to attend college is that some countries emphasize non-academic tracks in high school; these could potentially affect the educational trajectory of students based on their family background. It is commonly believed that tracking strengthens the relationship between family background and educational attainment (see Brunello and Checchi 2007), because family background may influence parents' and school officials' assessment of a child's potential and career trajectory. One study of early tracking concludes that this practice widens the distribution of students' cognitive skills (Hanushek and Woessmann 2006), to the harm of those choosing a vocational track.

There are a number of ways to capture cross-national differences in the degree of emphasis countries place on vocational education. One obvious way is by the percentage of youth in each country gaining terminal vocational degrees. Among citizens between the ages of 25 to 35 in our 19 countries, the percentage with this degree in 2006 ranged from 14 percent in Ireland to 52 percent in Germany (see Table 4). Figure 6 displays these vocational degree rates for males (Y Axis) along with the relative probability of attending college based on father's college status (X Axis). As shown, the scatterplot does not make evident a clear relationship between the two.

Figure 6 here

Finally, cross national patterns may be associated with differences in college-enrollment rates; this would be expected if in all countries the marginal college student comes from families with less formal education.

As Table 1 shows, the percent of college-educated among the Generation 2 population varies from a high of 52 percent in Norway to a low of 17 percent in the Czech Republic. Matching these percentages with the degree to which college is associated with family background reveals a strong negative correlation between the two (-.65 for males and -.77 for females).

To conduct a more formal analysis of college-going outcomes, we pool the country-level survey data of Generation 2 respondents and link each individual with all of the country-level factors discussed above. We then repeat the logistic regressions from above, only now add in the country-level variables as independent variables. The results (Table 5) indicate that the

relative probability of attaining a college degree does not decrease with larger public subsidies, nor is there any meaningful association with the size of vocational education opportunities in the country, or the degree of variation among countries in the importance of socioeconomic status on youth's cognitive skills. However, the results do indicate that higher rates of college enrollment lead to more equitable college enrollment patterns across countries. Calculations displayed in Table 5 show that when only 25 percent of the population gains a college degree, the relative probability of completing college is a predicted 2.14, whereas in countries where 40 percent gain a college degree, the predicted relative probability is a much lower 1.8.

Hence, based on evidence both across time and now across countries, the results here suggest that expansions in higher education have been one of the most effective ways for countries to improve educational mobility.

Table 5 here (forthcoming)

5. Discussion and Limitations

Our measurement of the intergenerational transmission of college-going status represents only one way to ascertain the degree to which educational attainment is passed down from one generation to the next. Moreover, equating educational mobility with social mobility, an implicit point in this paper, can in some instances be misleading.

One problem with our use of a relative measure (the probability for one group relative to another), is that it loses information on the level of college going within countries. However, absolute differences (i.e., the difference in college going between the two groups) is highly correlated with our relative measures (correlation of .74 to .80), and the results presented here are not altered in any substantial way if one were to substitute an absolute for the relative indicator measure.

The paper's focus on a specific outcome is one of growing relevance for both social mobility and macroeconomic performance. As such it has particular policy relevance. The indicator used also has the benefit of having straightforward and easy-to interpret meanings. Among males, for instance, we find that those in Generation 2 with a college-educated father in Norway are 1.95 times more likely to earn a college degree than are those without a college-educated father. In Ireland, they are 2.96 times more likely to attend college, and in Portugal 4.29 times more likely.

However, the definition of a "college educated" parent we use is based on having a college-educated father but not mother. This choice is one primarily driven by the fact that in many countries, few mothers of the Generation 2 cohort had a college degree. Defined in a different way (e.g., both parents having a college degree), it is possible we would find different results.

We also do not distinguish between those with a college degree, and those whose education level exceeds a college degree. Nor do we distinguish between the prestige of the institution or type of degree earned. The fact that we treat all those attaining a college degree as having similar outcomes obscures these features of educational outcomes, and the fact that the outcomes of the marginal student may be very different from the outcomes of the average.

The measure of association here is a gross one, meaning it does not account for variation across countries in factors associated with parents' college attendance status. For instance, studies within countries often find that genes partially explain the association between parents' and their children's educational attainment: the children of those with higher educational levels are for reasons of genetic inheritance themselves more likely to attend college (Black et al; Holmlund et al). Such a genetic component might be stronger in some countries than others, especially if assortative mating practices differ, as results in Couch and Dunn (1997) suggest. Assortative mating could be especially strong in countries with a longer tradition of females attending college. The college (and non-college) experience could also be quite different in different countries, which could give rise to different non-economic preferences among them. We also do not take account of other demographic characteristics of families with and without a college educated father. These pools may differ in their degree to which they are distinguished by poverty rates, social marginalization, geographical location, and peer effects, to name but a few.

The robustness of our findings regarding the influence of country-level features of nations on who goes to college is exaggerated by the fact that we have tens of thousands of individuals, we only have 19 different country-level observations. For this reason our findings should be considered suggestive rather than definitive.

6. Conclusions

The descriptive results show that, as measured in this study, the association between a father's college-going status and the college-going choices of his children has weakened somewhat dramatically between the generation born after WWII and those born during the 1970s and 1980s. Moreover, the association has weakened the most in countries with greater expansions in college enrolments. Clearly, the widespread growth in college attendance over the last several decades has transformed college into an opportunity less for an elite segment of the population, and one more broadly participated in by those across the socioeconomic spectrum. And the results of this paper provides reason to believe that countries today with larger college-going populations do more to promote social mobility than do those with small populations. Given the growing importance of advanced degrees on economic and life outcomes, and the fairly high levels of college attainment already achieved in some countries, this might suggest that the time is ripe to turn attention to analyzing the characteristics of who obtains advanced degrees.

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Figure 1: Change Over Time in the Relative Probability of College Attendance Between Those With and Without a College-Educated Father (Males)

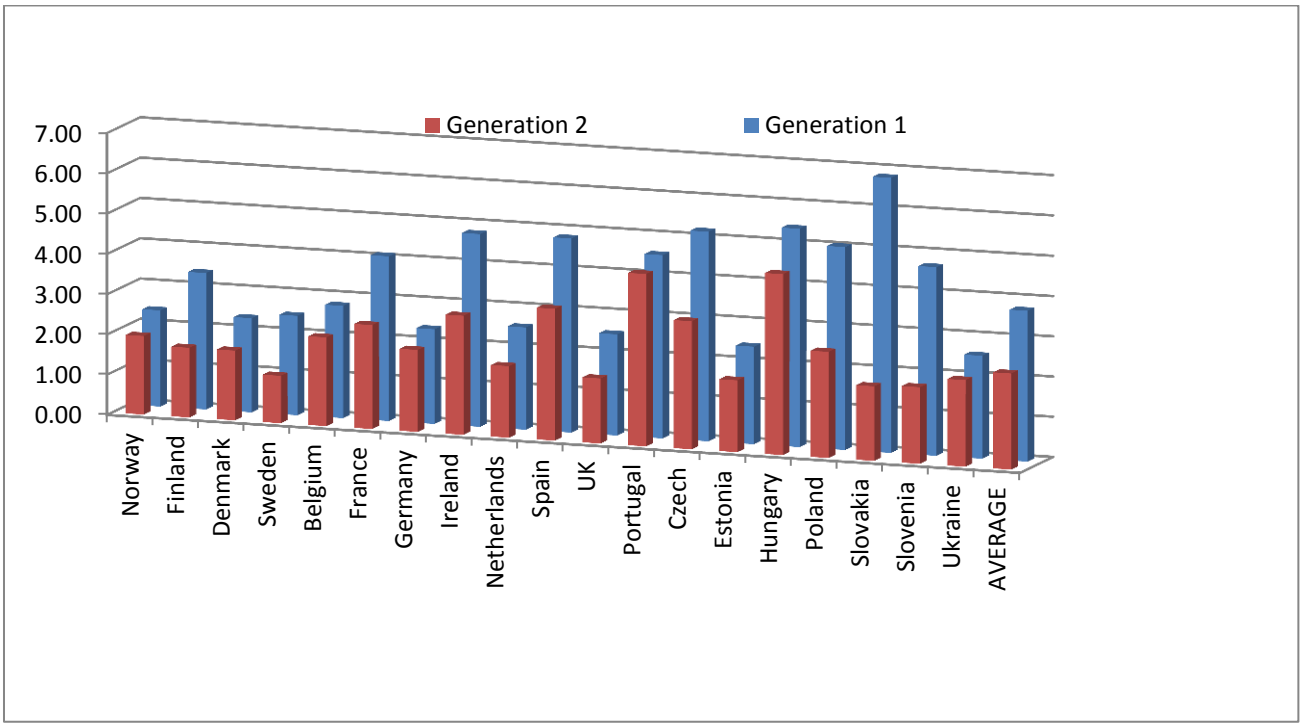


Figure 2: : Change Over Time in the Relative Probability of College Attendance Between Those With and Without a College-Educated Father (Females)

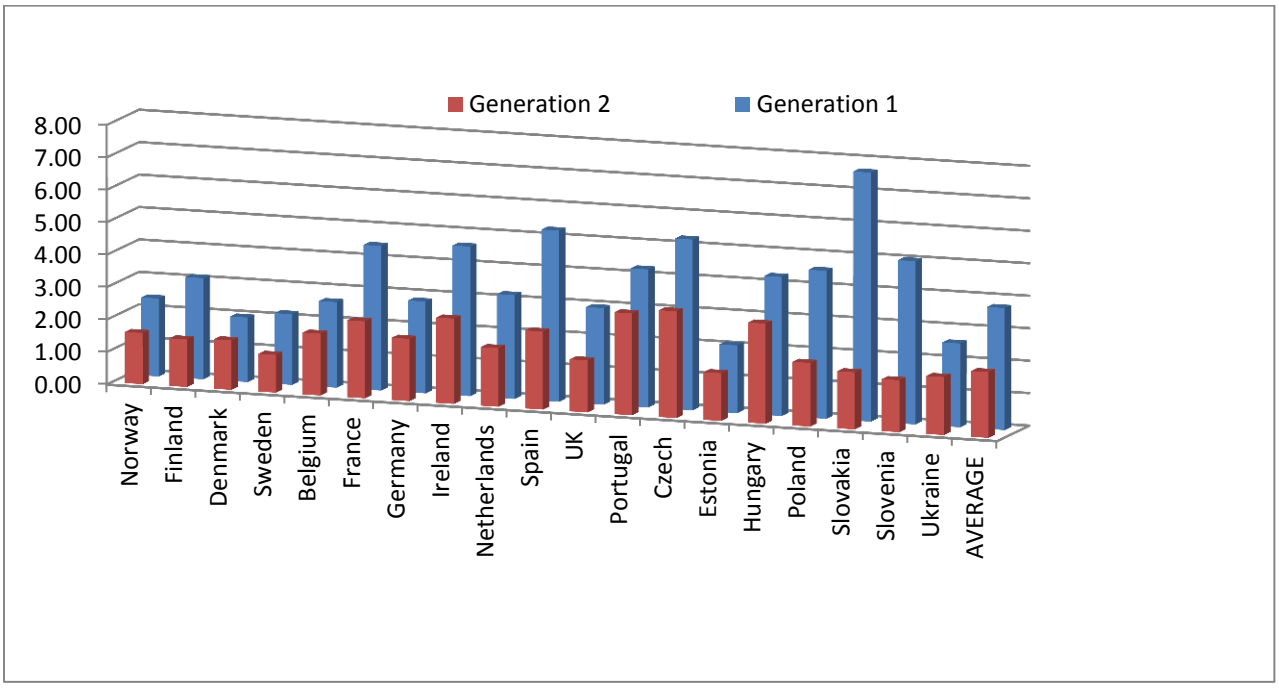
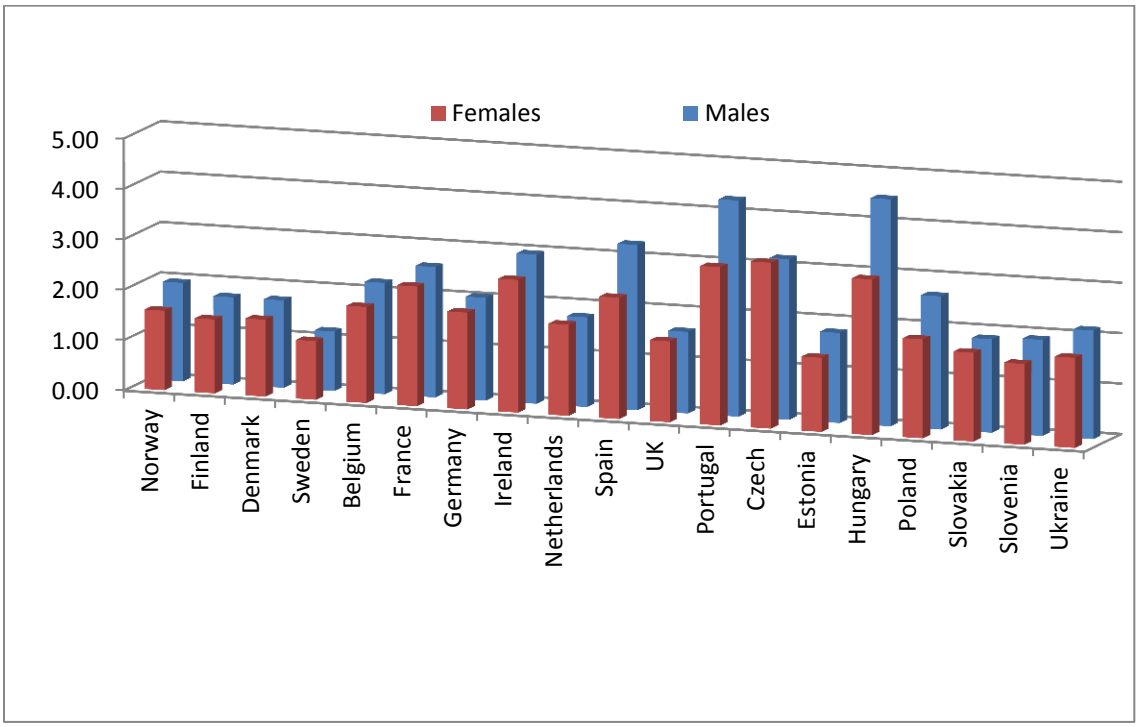


Figure 3 The Relative Probability of College Attendance Between Those With and Without a College-Educated Father, Females versus Males (Generation 2 Cohort)



Source: Figures 1 and 2.

Figure 4. Percent of Total Higher Ed Spending from the Public (Y Axis) and Relative Probability of College attendance for Males (X Axis)

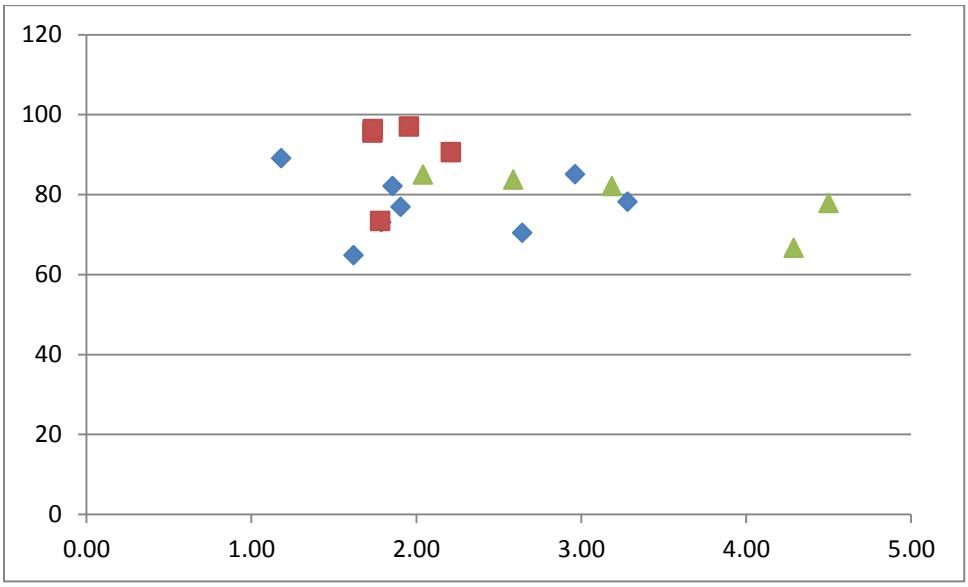


Figure 5: Percent of Variation in 2006 PISA Reading Score Explained by SES Status (Y Axis) and Relative Probability of College Attendance (X Axis)

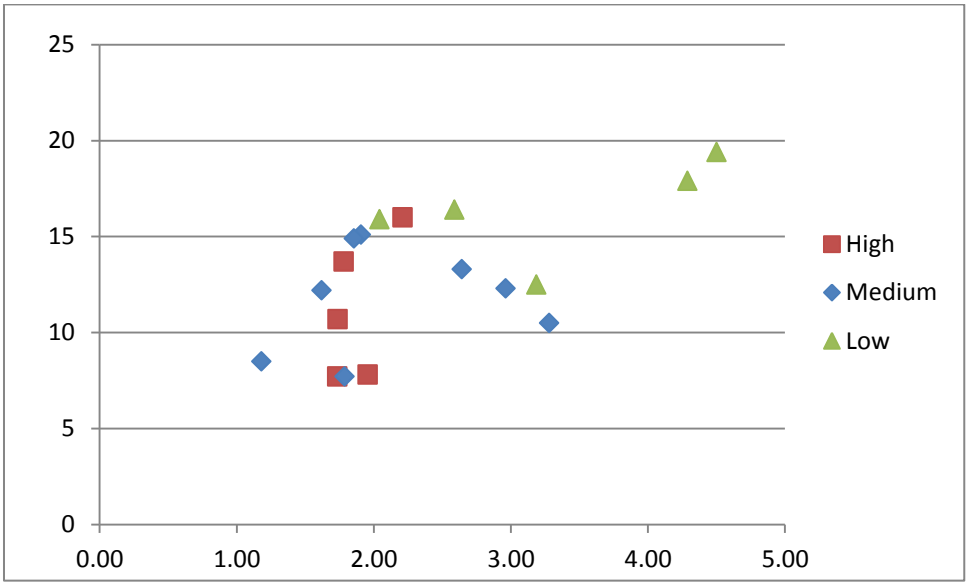


Figure 6. Percent of Generation 2 with Vocational High School Degree (Y Axis) and Relative Probability of Attending College (X Axis)

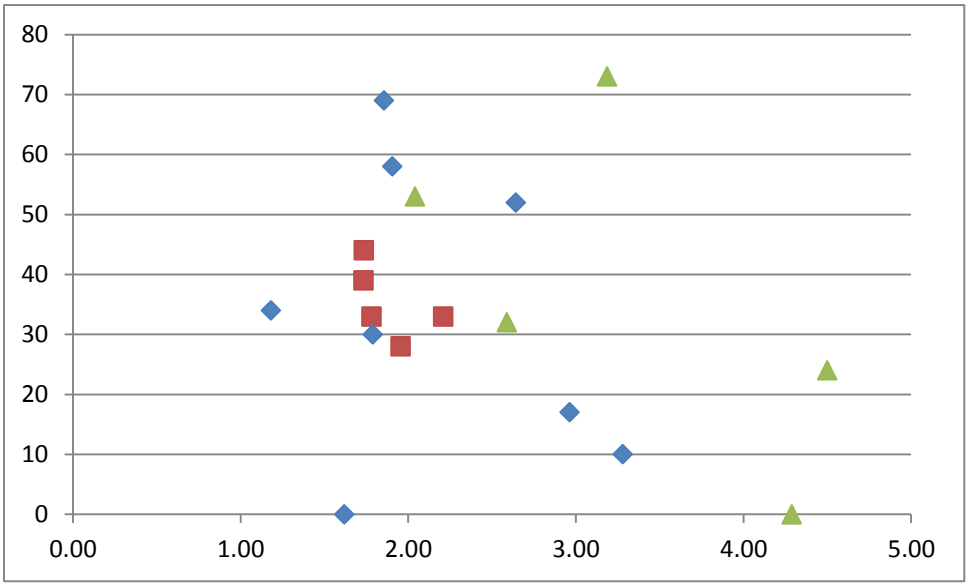


Figure 7: Relative Probability of College Attendance (X Axis) and Percent of Generation 2 with a College Degree (Y Axis)

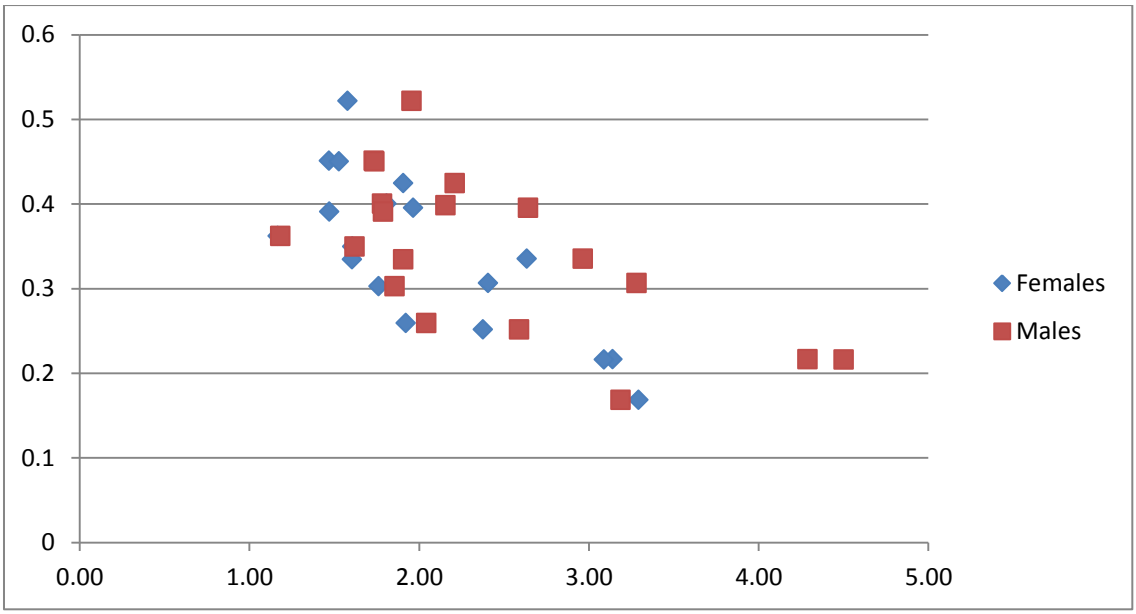


Table 1: Characteristics of Generation 1 and Generation 2 Populations, By Country

	Norway	Finland	Denmark	Sweden	Belgium	France	Germany	Ireland	Netherlan	Spain	UK	Portugal	Czech	Estonia	Hungary	Poland	Slovakia	Slovenia	Ukraine
Waves Used	**4-7**	**5-7**	**4-7**	**5-7**	**4-7**	**4-7**	**4-7**	**5-7**	**4-7**	**4-6**	**5-6**	**4-6**	**4-7**	**5-7**	**4-6**	**4-7**	**4-6**	**4-7**	**4-7**
Total Observations																			
Generation 1																			
Total observations	1135	1191	1243	867	1337	1496	2396	1365	1579	1014	876	1254	1636	1167	981	1344	1244	976	1122
Used in Logit	1107	1150	1173	761	1179	1253	2107	1107	1273	929	535	1009	1505	963	911	1203	1138	877	952
Percent college	35,7 %	22,3 %	36,4 %	24,4 %	29,4 %	14,9 %	23,5 %	14,3 %	25,5 %	19,5 %	18,3 %	8,1 %	12,2 %	27,6 %	13,1 %	13,6 %	13,1 %	11,8 %	29,1 %
Percent college-father	15,8 %	7,3 %	14,9 %	12,0 %	13,5 %	8,2 %	11,1 %	4,3 %	8,3 %	7,7 %	6,6 %	1,7 %	8,3 %	12,0 %	5,2 %	3,9 %	7,7 %	4,7 %	12,6 %
Percent college--mother	6,1 %	2,9 %	8,2 %	7,0 %	6,3 %	1,9 %	2,8 %	2,3 %	3,0 %	2,5 %	3,1 %	1,1 %	3,0 %	9,4 %	2,6 %	1,9 %	2,1 %	2,6 %	8,8 %
Percent male	52,9 %	50,3 %	51,7 %	45,9 %	48,5 %	49,2 %	51,3 %	41,8 %	49,0 %	46,1 %	46,5 %	36,6 %	49,0 %	40,9 %	45,2 %	46,4 %	44,9 %	48,2 %	32,4 %
Percent belong minority	3,2 %	1,3 %	2,2 %	3,2 %	3,4 %	3,5 %	3,4 %	1,9 %	4,4 %	3,4 %	7,7 %	1,9 %	2,2 %	24,9 %	4,5 %	2,0 %	5,2 %	2,7 %	7,6 %
Percent native born	91,5 %	98,3 %	93,2 %	86,2 %	87,7 %	89,1 %	90,1 %	90,1 %	92,5 %	92,0 %	88,9 %	95,4 %	97,9 %	75,6 %	98,9 %	99,6 %	97,8 %	86,9 %	87,5 %
Percent father native b	91,2 %	98,0 %	92,6 %	81,5 %	85,2 %	83,3 %	84,2 %	91,5 %	90,6 %	92,8 %	84,2 %	96,5 %	93,9 %	56,8 %	96,2 %	95,6 %	96,1 %	84,1 %	77,5 %
Percent m native born	91,2 %	98,2 %	92,0 %	79,5 %	84,7 %	84,2 %	85,9 %	91,9 %	89,7 %	92,4 %	85,6 %	95,3 %	94,0 %	58,2 %	97,4 %	95,3 %	96,2 %	84,7 %	80,7 %
Generation 2																			
Total observations	997	916	830	795	1116	1159	1623	1376	971	1200	701	894	1394	994	889	1292	913	851	1090
Used in Logit	944	866	799	668	1000	983	1381	1214	947	1112	409	797	1337	807	818	1192	809	786	876
Percent college	52,2 %	45,1 %	45,0 %	36,2 %	42,5 %	25,2 %	25,9 %	33,5 %	40,0 %	30,7 %	35,0 %	21,6 %	16,8 %	39,1 %	21,6 %	39,6 %	30,3 %	33,5 %	39,9 %
Percent college-father	33,7 %	24,9 %	29,1 %	25,6 %	26,7 %	14,0 %	18,8 %	11,8 %	23,2 %	12,6 %	22,7 %	4,5 %	13,0 %	27,3 %	10,1 %	11,9 %	12,9 %	11,3 %	22,3 %
Percent college--mother	32,7 %	23,7 %	31,7 %	26,6 %	23,5 %	8,2 %	13,3 %	10,7 %	15,3 %	7,4 %	16,1 %	4,3 %	9,0 %	29,2 %	9,9 %	11,5 %	10,4 %	10,3 %	23,2 %
Percent male	52,6 %	49,2 %	51,0 %	52,2 %	48,9 %	42,0 %	51,3 %	48,5 %	40,9 %	49,4 %	41,7 %	44,2 %	50,0 %	47,6 %	46,3 %	51,2 %	37,7 %	49,9 %	42,3 %
Percent belong minority	7,7 %	2,7 %	5,9 %	6,1 %	8,3 %	8,3 %	8,7 %	8,1 %	10,2 %	4,4 %	15,4 %	2,7 %	3,0 %	18,9 %	8,8 %	0,9 %	5,1 %	2,4 %	6,5 %
Percent native born	82,4 %	91,4 %	90,0 %	84,7 %	83,8 %	87,7 %	81,7 %	74,8 %	89,4 %	82,9 %	79,3 %	89,9 %	98,9 %	95,1 %	98,0 %	99,7 %	98,7 %	95,7 %	95,4 %
Percent father native b	80,2 %	92,4 %	88,2 %	77,5 %	73,5 %	77,4 %	74,1 %	73,7 %	82,7 %	82,7 %	71,8 %	89,5 %	95,4 %	77,4 %	97,9 %	99,1 %	97,1 %	86,6 %	88,1 %
Percent m native born	82,1 %	92,7 %	87,5 %	77,5 %	75,6 %	79,0 %	76,3 %	74,3 %	83,3 %	82,3 %	72,0 %	88,9 %	97,0 %	79,4 %	96,7 %	99,1 %	97,7 %	88,0 %	88,6 %
Note: Population estimates based on weighting observations with design data (dweight).																			

Table 2: Logit Coefficients by Country and Generation: Dependent Variable: College Degree=1

	Norway		Finland		Denmark		Sweden		Belgium		France		Germany	
	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1
CollGradFath	1,24 ***	1,701 ***	0,927 ***	1,91 ***	0,91 ***	1,49 ***	0,241	1,266 ***	1,3 ***	1,804 ***	1,442 ***	2,096 ***	0,981 ***	1,461 ***
CollGradMoth	0,684 ***	1,137 ***	0,461 **	0,882 **	0,529 ***	0,816 ***	1,142 ***	0,983 ***	1,516 ***	1,015 ***	1,134 ***	1,807 ***	1,029 ***	1,373 ***
Male	-0,725 ***	0,009	-0,736 ***	-0,202	-0,578 ***	-0,462 ***	-0,236	-0,464 ***	-0,477 ***	-0,137	-0,266 *	0,205	-0,296 **	0,578 ***
Constant	-0,062	-0,917 ***	-0,111	-1,37 ***	-0,313 ***	-0,585 ***	-0,68 ***	-1,12 ***	-0,634 ***	-1,065 ***	-1,143 ***	-2,036 ***	-1,192 ***	-1,675 ***
N	944	1107	866	1150	799	1173	668	761	1000	1179	983	1253	1381	2107
Note: ***=1 percent significance, **= 5 percent significance, *=10 percent significance														

	Ireland		Netherlands		Spain		UK		Portugal		Czech		Estonia	
	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1
CollGradFath	2,046 ***	2,234 ***	1,104 ***	1,804 ***	1,934 ***	2,872 ***	0,9 ***	1,455 ***	2,308 ***	1,813 ***	1,536 ***	2,138 ***	0,8 ***	1,29 ***
CollGradMoth	1,297 ***	2,47 ***	1,158 ***	2,051 ***	1,031 ***	1,385 ***	0,629 **	1,87 ***	1,441 ***	2,367 ***	0,738 ***	1,707 ***	0,879 ***	0,973 ***
Male	-0,251 *	-0,087	0,058	0,56 ***	-0,699 ***	0,147	-0,037	0,564 ***	-0,611 ***	-0,264	0,121	-0,001	-1,06 ***	-0,52 ***
Constant	-0,906 ***	-1,966 ***	-0,702 ***	-1,539 ***	-0,768 ***	-1,808 ***	-0,555 ***	-1,868 ***	-1,135 ***	-2,366 ***	-2,061 ***	-2,414 ***	-0,327 ***	-0,938 ***
N	1214	1107	947	1273	1112	929	409	535	797	1009	1337	1505	807	963
Note: ***=1 percent significance, **= 5 percent significance, *=10 percent significance														

	Hungary		Poland		Slovakia		Slovenia		Ukraine	
	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1
CollGradFath	2,032 ***	2,166 ***	1,763 ***	2,282 ***	0,858 ***	2,898 ***	0,938 ***	2,158 ***	1,192 ***	1,613 ***
CollGradMoth	1,139 ***	0,98 *	1,572 ***	1,707 ***	2,706 ***	1,12 *	0,699 ***	0,759	0,803 ***	1,466 ***
Male	-0,755 ***	-0,621 ***	-0,726 ***	-0,224	-0,291 *	0,212	-0,788 ***	0,178	-0,66 ***	0,023
Constant	-1,389 ***	-1,84 ***	-0,373 ***	-1,897 ***	-1,098 ***	-2,448 ***	-0,482 ***	-2,264 ***	-0,544 ***	-1,182 ***
N	818	911	1192	1203	809	1138	786	877	876	952
Note: ***=1 percent significance, **= 5 percent significance, *=10 percent significance										

Table 3: Probabilities and Relative Probabilities of College Attendance, by Country, Generation and Gender

	Probability of College For Males				Probability of College For Females				Ratio College Father/No College Father			
	------Father College-----		----Father Not College----		------Father College----		----Father Not College----		---------Males----------		--------Females----------	
	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1	Gen 2	Gen 1
Norway	0,61	0,69	0,31	0,29	0,76	0,69	0,48	0,29	1,95	2,40	1,58	2,40
Finland	0,52	0,58	0,30	0,17	0,69	0,63	0,47	0,20	1,73	3,39	1,47	3,12
Denmark	0,50	0,61	0,29	0,26	0,64	0,71	0,42	0,36	1,74	2,34	1,53	1,99
Sweden	0,34	0,42	0,29	0,17	0,39	0,54	0,34	0,25	1,18	2,47	1,17	2,18
Belgium	0,55	0,65	0,25	0,23	0,66	0,68	0,35	0,26	2,21	2,80	1,91	2,64
France	0,51	0,57	0,20	0,14	0,57	0,51	0,24	0,12	2,59	4,10	2,37	4,46
Germany	0,38	0,59	0,18	0,25	0,45	0,45	0,23	0,16	2,04	2,36	1,92	2,83
Ireland	0,71	0,55	0,24	0,11	0,76	0,57	0,29	0,12	2,96	4,79	2,63	4,61
Netherlands	0,61	0,70	0,34	0,27	0,60	0,57	0,33	0,18	1,78	2,55	1,81	3,20
Spain	0,61	0,77	0,19	0,16	0,76	0,74	0,32	0,14	3,28	4,83	2,41	5,28
UK	0,58	0,54	0,36	0,21	0,59	0,40	0,36	0,13	1,62	2,52	1,61	2,98
Portugal	0,64	0,31	0,15	0,07	0,76	0,37	0,24	0,09	4,29	4,56	3,14	4,26
Czech	0,40	0,44	0,13	0,08	0,37	0,43	0,11	0,08	3,19	5,21	3,29	5,26
Estonia	0,36	0,46	0,20	0,19	0,62	0,59	0,42	0,28	1,79	2,43	1,47	2,09
Hungary	0,47	0,43	0,10	0,08	0,62	0,59	0,20	0,14	4,50	5,43	3,09	4,28
Poland	0,66	0,54	0,25	0,11	0,80	0,60	0,41	0,13	2,64	5,04	1,96	4,56
Slovakia	0,37	0,66	0,20	0,10	0,44	0,61	0,25	0,08	1,86	6,83	1,76	7,67
Slovenia	0,42	0,52	0,22	0,11	0,61	0,47	0,38	0,09	1,91	4,69	1,60	5,03
Ukraine	0,50	0,61	0,23	0,24	0,66	0,61	0,37	0,23	2,15	2,56	1,79	2,58
AVERAGE	0,51	0,56	0,23	0,17	0,62	0,57	0,33	0,17	2,39	3,75	2,03	3,76

Table 4

	Cost of Higher Education (2006)		Vocational Education (1)		SES and Cognitive Skills, 16 year olds (2)	
	Percent Public	Percent	Percent with VET Degree		Test Score	Point
	Exp	HH Expend	Males	Females	Variation	Spread
Norway	97	3	28	17	7,8	69
Finland	95,5	na	39	33	7,7	63
Denmark	96,4	3,6	44	34	10,7	90
Sweden	89,1	na	34	21	8,5	77
Belgium	90,6	4,7	33	25	16	110
France	83,7	10,1	32	23	16,4	122
Germany	85	na	53	50	15,9	111
Ireland	85,1	13,2	17	12	12,3	88
Netherlands	73,4	15,5	33	32	13,7	100
Spain	78,2	17,6	10	16	10,5	87
UK	64,8	26,6	na	na	12,2	103
Portugal	66,7	27,6	na	na	17,9	93
Czech	82,1	9	73	65	12,5	99
Estonia	73,1	24,9	30	24	7,7	66
Hungary	77,9	0	24	23	19,4	108
Poland	70,4	29,6	52	38	13,3	86
Slovakia	82,1	9,4	69	57	14,9	103
Slovenia	76,9	16,9	58	42	15,1	106
Ukraine	0	0	0	0	0	0
Average					12,5	99

(1) 25-35 year olds in 2011

(2) Test Score Variation Based on Reading PISA in 2006, Point Spread based on Science PISA in 2000