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A New Proposal to Gauge Intergenerational Mobility: Educational Mobility in Europe as a Case Study

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Abstract This paper is aimed at presenting a new intergenerational mobility index that (a) combines the intergenerational elasticity and the R-squared of the intergenerational regression and (b) enables the expression of the total degree of mobility as the weighted sum of mobility with respect to both parents. As a case study, we apply our proposal to investigate the intergenerational mobility of education in several European countries and its changes across birth cohorts. The results derived from the proposed index indicate that Nordic countries display higher levels of educational mobility than Southern countries, whereas continental countries are in an intermediate position. Moreover, it appears that the degree of mobility increases over time only in those countries with low initial levels and remains stable for the most mobile countries. Finally, for most of the countries the proposed methodology can prove that the degree of educational mobility with respect to each parent tends to converge to the same level over the course of time.

Keywords Intergenerational mobility · Education · Europe · Birth cohorts

1 Introduction

The existence of a statistical association between individual outcomes and parental socio-economic position is considered a violation of equality of opportunities. A high level of

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association indicates low mobility and implies that individuals of poor social origin face restricted life chances and will have difficulties in achieving their complete economic potential. Even so, the optimal level of intergenerational mobility may not be the highest—i.e. zero intergenerational correlation—because, from the efficiency perspective, this could imply the wrong allocation of individuals' talent in the economy (see Piketty 2000; Black and Devereux 2010, for a general overview).

Empirical research on intergenerational mobility has significantly expanded since the 1980s. A large number of contributions can be found in the sociological literature. Traditionally, sociologists have prevalently been concerned about intergenerational association in occupation or social class.¹ However, most of the economic literature has been concerned with intergenerational persistence in earnings or income (Solon 1999, 2002; Corak 2004; Blanden 2009; Black and Devereux 2010 provide extensive reviews of these topics). The economic literature, however, contains a growing number of contributions concerned with the analysis of educational mobility from an intergenerational perspective. Indeed, from a theoretical perspective, the relationship between individual and parental education is one of the most important mechanisms behind intergenerational socio-economic persistence (Solon 2004).

Many studies (like this one) are explicitly focused on the 'measurement' of educational mobility in a descriptive sense. An important contribution concerning this specific topic is that of Checchi et al. (1999), who compare educational mobility (and income inequality) in Italy and the US, concluding that Italy has lower levels of mobility than the US despite having lower levels of inequality. Comi (2003) considers earnings and educational mobility in Europe, using data from the ECHP. She reports low levels of mobility for countries in Southern Europe, France and Ireland, high levels for Nordic countries, the Netherlands and Austria and an intermediate position for Belgium and Germany. Another study by Chevalier et al. (2009) is based on data from the International Adult Literacy Survey (IALS). His general results suggest that educational mobility is negatively correlated with educational inequality and that the degree of mobility has increased over time. Moreover, Chevalier et al. (2009) also find that Nordic countries are the most mobile and that the least mobile are Germany, Italy, Ireland and Poland. Checchi et al. (2008) recently analysed educational persistence across cohorts in Italy, finding that although mobility has increased over time, the relative disadvantage of individuals from poor backgrounds persists up to the end of the period considered. Finally, Hertz et al. (2008) compare the temporal patterns of the intergenerational transmission of education for 42 different countries, considering both absolute and relative measures of mobility. Their results show a significant heterogeneity between countries but also between the measures of mobility considered. They suggest that northern European countries display the lowest persistence, whereas the records of greatest persistence are those of Latin American countries. Moreover, they show that although the intergenerational elasticity of education tends to decrease over time, the correlation coefficient between parental and children's schooling appears to remain stable over time.

The main contribution of this article to the existing literature consists of an alternative methodological proposal to gauge intergenerational mobility. First, we define a new index for measuring intergenerational mobility that combines the intergenerational elasticity coefficient with the R-squared of the intergenerational regression. Second, our index represents the weighted average of the degree of mobility with respect to each parent. Moreover, the separate contributions of the father and mother can be derived, enabling the study of differences in the degree of educational persistence with respect to the two parents.

¹ See Erikson and Godthorpe (2002), Esping-Andersen (2004), and Goldthorpe and Mills (2005) for a comprehensive review of the sociological literature on intergenerational mobility.

We also apply our methodology, as a case study, to twelve European countries,² providing additional cross-country evidence on the intergenerational mobility of education. We use homogeneous data from the 2005 wave of EU-SILC, which contain retrospective information about parental education and family characteristics at the age of fourteen. Moreover, by computing our measure of intergenerational mobility separately for different birth cohorts (eighty five-year birth cohorts), we are able to consistently analyse the temporal patterns of educational persistence in several European countries over a long period of time (i.e. for individuals born between 1940 and 1980).

With these purposes in mind, the rest of the paper proceeds as follows. Section 2 is dedicated to the definition of the mobility index and its properties, Sect. 3 contains the empirical results of our case study for the selected European Countries and Sect. 4 concludes.

2 Empirical Methodology

Traditionally, much of the empirical research on socio-economic mobility has been centred on measuring the “degree” of the intergenerational transmission of socio-economic status. Focusing on education mobility, one may describe the statistical association between parental and children’s educational attainments using probabilistic measures such as the transition matrices (or derived indices) described in Checchi (2006) and adopted by Comi (2003), Chevalier et al. (2009) and Heineck and Riphahn (2009).

A common alternative consists of the use of regression coefficients between the logarithm of children’s and parents’ years of completed schooling (i.e. intergenerational elasticity) or correlation coefficients, which respectively represent a relative and an absolute or standardised measure of intergenerational educational persistence. As suggested by Hertz et al. (2008) and Checchi et al. (2008), an increase in the variance of parental education (relative to the variance of children’s education) may distort the measure of mobility expressed in terms of intergenerational elasticity. That is, an increase (decrease) in the estimated intergenerational elasticity may only be the result of an increase (decrease) in the dispersion of children’s schooling relative to the dispersion of parents’ schooling. Indeed, the correlation coefficient represents an absolute or standardised measure of mobility because it is normalised with respect to relative changes in inequalities in education for the children’s and the parent’s generations.³ In any case, both measures of

² Namely: Denmark, Finland, Norway and Sweden (Nordic countries); Austria, Belgium, France and the Netherlands (Continental countries); Greece, Italy, Portugal and Spain (Southern countries). We found serious anomalies in the original EU-SILC data referring to parental level of education in the cases of Germany and the United Kingdom that prevented us from using these countries in our analyses. After we sought information from EUROSTAT, it was clear that there were problems with the original data collection and codification that could not be solved subsequently. On the one hand, EU-SILC German data on the parental level of education are affected by lack of homogeneity between the classifications used in East and West Germany. This caused an overrepresentation of the ISCED 5 level, which may be verified by comparing original EU-SILC German data with European Social Survey data (2006 wave) and also with data drawn from the German Socio-Economic Panel (2003), as shown by Heineck and Riphahn (2009). On the other hand, data referring to the United Kingdom present a serious problem with severe overrepresentation of cases coded as ISCED 0; this overrepresentation may be confirmed through a comparison with European Social Survey data (2006 wave).

³ Additionally, Checchi et al. (2008) propose an intuitive decomposition of the correlation coefficient, whose results are highly appealing for the analysis of temporal changes because they may account for changes in composition effects and thus provide the “correct measure for analysing intergenerational transmission of education” (the marginal probability of children’s education, conditional to that of the parents).

intergenerational mobility provide informative evidence, as also suggested by Black and Devereux (2010).

From the methodological perspective, we contribute to the intergenerational mobility literature by suggesting a new mobility index that makes two advances in the measurement of intergenerational mobility. First, as we show below, we propose an alternative mobility index that combines these two alternative measures of intergenerational mobility, reconciling the traditional dichotomy between the use of regression or correlation coefficients. Specifically, the proposed index merges the intergenerational elasticity coefficient with the R-squared of the intergenerational regression.⁴ This means that for a given intergenerational elasticity, the degree of mobility would be higher the dispersion in the relationship between parental and children’s education and vice versa.

Second, it is worth noting that regression or correlation coefficients (but also transition matrices) have usually been estimated with respect to a single proxy of parental education (father’s education, higher completed parental education, mean parental education, etc.). However, we believe that the intergenerational transmission of education is a process that simultaneously involves both parents, albeit to different extents. Our mobility index can encompass this limitation, because it combines the degree of mobility with respect to the father and with respect to the mother. Moreover, the separate contributions of the father and mother can be derived, enabling the study of differences in the degree of educational persistence with respect to the two parents.

2.1 A New Mobility Index: Definition

The measure of intergenerational mobility proposed here consists of a generalisation of the mobility index proposed by Raymond et al. (2009). Let us define,

$$\begin{aligned}
 c &= \left[\ln(\text{Years of education of the child}) - \overline{\ln(\text{Years of education of the child})} \right] \\
 m &= \left[\ln(\text{Years of education of the mother}) - \overline{\ln(\text{Years of education of the mother})} \right] \\
 f &= \left[\ln(\text{Years of education of the father}) - \overline{\ln(\text{Years of education of the father})} \right]
 \end{aligned}$$

where the elements $\overline{\ln(\cdot)}$ represent average values, the educational mobility index is defined as:

$$\begin{aligned}
 I &= \frac{\hat{\sigma}_{(c-f)}^2 + \hat{\sigma}_{(c-m)}^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2) + (\hat{\sigma}_c^2 + \hat{\sigma}_m^2)} = \lambda_1 \cdot \frac{\hat{\sigma}_{(c-f)}^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2)} + \lambda_2 \cdot \frac{\hat{\sigma}_{(c-m)}^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_m^2)} \\
 &= \lambda_1 \cdot (\text{Child vs father mobility index}) + \lambda_2 \cdot (\text{Child vs mother mobility index})
 \end{aligned} \tag{1}$$

$$\lambda_1 = \left(\frac{\hat{\sigma}_c^2 + \hat{\sigma}_f^2}{2 \cdot \hat{\sigma}_c^2 + \hat{\sigma}_f^2 + \hat{\sigma}_m^2} \right) \tag{2}$$

$$\lambda_2 = \left(\frac{\hat{\sigma}_c^2 + \hat{\sigma}_m^2}{2 \cdot \hat{\sigma}_c^2 + \hat{\sigma}_f^2 + \hat{\sigma}_m^2} \right) \tag{3}$$

⁴ Note that the R-squared from the bivariate regression between parental and children’s schooling represents the square of the correlation coefficient between the two variables.

$$\lambda_1 + \lambda_2 = 1 \tag{4}$$

where

$$\hat{\sigma}_c^2 = \frac{1}{N-1} \sum c^2 \tag{5}$$

$$\hat{\sigma}_f^2 = \frac{1}{N-1} \sum f^2 \tag{6}$$

$$\hat{\sigma}_m^2 = \frac{1}{N-1} \sum m^2 \tag{7}$$

$$\hat{\sigma}_{(c-f)}^2 = \frac{1}{N-1} \sum (c-f)^2 \tag{8}$$

$$\hat{\sigma}_{(c-m)}^2 = \frac{1}{N-1} \sum (c-m)^2 \tag{9}$$

The mobility index in (1) can be represented in an equivalent form, that is:

$$I = \frac{\sum (c-f)^2 + \sum (c-m)^2}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2}$$

This alternative specification enables us to prove that, for any non-negative correlation between parental and children’s schooling, the intergenerational mobility index I will always be included in the interval (0, 1). First, let us suppose that the father and the mother share the same educational level: if the child replicates the educational level of the parents, the value of the index is 0, which is the case of perfect immobility. In fact, in this case we have:

$$I = \frac{\sum (c-f)^2 + \sum (c-m)^2}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2} = 0$$

because, by definition, both elements of the numerator are equal to zero. Second, on the opposite side, the maximum value that I can reach is 1, which represents the situation of perfect mobility. This happens because, with simple algebra, the numerator of the index can also be expressed:

$$I = \frac{\sum (c-f)^2 + \sum (c-m)^2}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2} = \frac{\sum c^2 + \sum f^2 - 2 \sum cf + \sum c^2 + \sum m^2 - 2 \sum cm}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2}$$

Indeed, if the covariance between the child’s and parents’ years of education is zero (i.e. the child’s outcome is independent from that of his/her parents), the index takes the value of 1, because in this case we have $\sum cf = 0$ and $\sum cm = 0$. Therefore, the mobility index is equal to:

$$I = \frac{\sum (c-f)^2 + \sum (c-m)^2}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2} = \frac{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2}{\sum c^2 + \sum f^2 + \sum c^2 + \sum m^2} = 1.$$

Also note that Eq. (1) shows that our index expresses intergenerational mobility as a weighted mean of the degree of mobility with respect to each parent. This means that, given the additive decomposability of the expression in (1), the proposed index also enables the analysis of intergenerational mobility with respect to both parents separately. We can therefore examine (i) whether an individual’s schooling is more (or only) attached

to the educational background of the father or that of the mother, and (ii) whether the contribution of each parent to intergenerational mobility changes over time and place.

2.2 An Alternative Reparametrization of the Mobility Index

The mobility index I can also be represented in terms of intergenerational persistence regression models that link the child’s log years of schooling⁵ to the log years of schooling of the two parents.

That is:

$$c = \hat{\beta}_f \cdot f + \hat{\epsilon}_f : \text{children versus father intergenerational regression}$$

$$c = \hat{\beta}_m \cdot m + \hat{\epsilon}_m : \text{children versus mother intergenerational regression}$$

After some algebra, the mobility index in (1) can be expressed as follows:

$$I = \left[\frac{(1 - R_f^2) + (1 - R_m^2)}{2} \right] \cdot \omega_1 + (1 - \hat{\beta}_f)^2 \cdot \omega_2 + (1 - \hat{\beta}_m)^2 \cdot \omega_3 \tag{10}$$

$$\omega_1 = \frac{2 \cdot \hat{\sigma}_c^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2) + (\hat{\sigma}_c^2 + \hat{\sigma}_m^2)} \tag{11}$$

$$\omega_2 = \frac{\hat{\sigma}_f^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2) + (\hat{\sigma}_c^2 + \hat{\sigma}_m^2)} \tag{12}$$

$$\omega_3 = \frac{\hat{\sigma}_m^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2) + (\hat{\sigma}_c^2 + \hat{\sigma}_m^2)} \tag{13}$$

$$\omega_1 + \omega_2 + \omega_3 = 1 \tag{14}$$

where

$$R_f^2 \text{ is the } R^2 \text{ of the OLS regression : } c = \hat{\beta}_f \cdot f + \hat{\epsilon}_f \tag{15}$$

$$R_m^2 \text{ is the } R^2 \text{ of the OLS regression : } c = \hat{\beta}_m \cdot m + \hat{\epsilon}_m \tag{16}$$

This reparameterization shows that the underlying definition of intergenerational mobility expressed by the proposed index captures both relative and absolute changes in intergenerational persistence, i.e. the intergenerational elasticity parameters (the betas) and the R-squared from the two intergenerational regressions respectively. As Eq. (10) shows, the mobility index increases when the explanatory power of paternal education R_f^2 and/or maternal education R_m^2 in the bivariate intergenerational regressions decreases and vice versa. Also the mobility index increases when the elasticity between the father’s and the child’s education $\hat{\beta}_f$ decrease and/or when the elasticity between the mother’s education and that of the child $\hat{\beta}_m$ decrease. Finally, note also that the contribution of “R-squared” mobility and “beta mobility” to the value of the proposed index depends on the weight attached to each component.

⁵ Note that the betas obtained from these regressions, where the dependent as well as the explanatory variables are expressed in terms of deviation from the respective means, are exactly the same as those that can be obtained from the OLS regressions with the original level variables plus an intercept term.

2.3 Distributional Considerations

In this subsection we introduce the empirical distribution of our mobility index, which could be useful to derive its confidence intervals for empirical applications. Starting from Eq. (1),

$$I = \frac{\hat{\sigma}_{(c-f)}^2 + \hat{\sigma}_{(c-m)}^2}{(\hat{\sigma}_c^2 + \hat{\sigma}_f^2) + (\hat{\sigma}_c^2 + \hat{\sigma}_m^2)},$$

and given that the statistics $\frac{\hat{\sigma}_{(c-f)}^2}{\hat{\sigma}_{(c-f)}^2}$, $\frac{\hat{\sigma}_{(c-m)}^2}{\hat{\sigma}_{(c-m)}^2}$, $\frac{\hat{\sigma}_c^2}{\hat{\sigma}_c^2}$ and $\frac{\hat{\sigma}_f^2}{\hat{\sigma}_f^2}$ follow χ^2 distributions divided by the corresponding number of degrees of freedom, it emerges that the proposed index holds a well-defined empirical distribution. In the following case study, we computed the empirical distributions of the mobility index by generating 20,000 replications of the elements of Eq. (1). However, it was not feasible to report the complete results because of the excess of information. One way of summarizing this large amount of information is to build empirical confidence intervals, even recognizing that the amplitude of those intervals depends on the selected confidence level. The selection of the confidence level is always arbitrary and less informative than showing the whole distribution, but this approach is a standard way of facilitating presentation. In our case, a confidence interval of 70 % has been selected. As the confidence level increases, the width of the interval also increases but the informative content of the interval decreases—i.e. there is some trade-off between exactness and relevance. The criterion selected to resolve this trade-off was that of obtaining one correct answer out of three (which is what a confidence interval of 70 % implies).

3 A Case Study: Educational Mobility in Europe 1940–1980

In this section, we present a case study in which we apply the proposed methodology to explore educational mobility in Europe over time. The empirical analysis was performed using the data from the 2005 wave of EU-SILC (European Survey on Income and Living Conditions) for 12 countries, divided into three groups according to the following standard classification: Denmark, Finland, Norway and Sweden defined as Nordic countries, Austria, Belgium, France and the Netherlands defined as Continental countries, and Greece, Italy, Portugal and Spain as Southern countries. As noted above, we consider the 2005 wave of the EU-SILC because it contains retrospective information about family characteristics and parental background when the individual was 14 years old. This particular wave of the European Survey also enables the sample to be divided into eight sub-samples of 5-year birth cohorts for each country.⁶ In order to compute the mobility index as in Eqs (1)–(2), we impute individuals', fathers' and mothers' years of education from the information on completed education defined in accordance with the ISCED classification. Years

⁶ Given that the additional questionnaire on family characteristics during childhood in the EU-SILC is only directed at individuals aged between 25 and 65 in 2005, we consider the first birth cohort 1940–1945 and the last 1975–1980. Table 1 contains the complete definition of birth cohorts, and the number of observations for each cohort for the selected European countries. In the case of Denmark, we cannot consider the first two birth cohorts (1940–1945 and 1945–1950), because the information on maternal education is not reliable (maternal education in the first two cohorts is fixed for all observations to ISCED2). We preferred to exclude these two initial cohorts from the analysis rather than compute mobility only with respect to parental education.

Table 1 Definition and sample size of birth cohorts

Birth charts	Nordic countries					Continental countries				Southern countries			
	Denmark	Finland	Norway	Sweden	Austria	Belgium	France	Netherlands	Greece	Italy	Portugal	Spain	
1940–1945	313	816	403	491	504	567	986	543	788	3,358	712	2,092	
1945–1950	282	985	421	432	474	648	1,193	585	804	3,506	688	1,987	
1950–1955	269	879	409	383	491	669	1,185	533	889	3,181	704	1,997	
1955–1960	396	799	437	355	567	705	1,213	558	886	3,413	761	2,313	
1960–1965	479	733	434	400	556	730	1,298	677	870	3,781	754	2,455	
1965–1970	461	621	429	390	533	663	1,215	669	915	3,582	663	2,174	
1970–1975	380	493	362	374	377	546	1,129	511	824	3,302	581	2,035	
1975–1980	184	393	209	257	217	390	667	257	604	2,032	419	1,409	
Total	2,764	5,719	3,104	3,082	3,719	4,918	8,886	4,333	6,580	26,155	5,282	16,462	

Table 2 Conversion of ISCED levels into equivalent years of education

Completed education	ISCED 0	ISCED 1	ISCED 2	ISCED 3	ISCED 4	ISCED 5–6
Nordic countries						
Denmark	2	6	9	12	13	15
Finland	2	6	9	12	13	16
Norway	2	6	9	12	13	16
Sweden	2	6	9	12	13	15
Continental countries						
Austria	2	4	8	12	13	16.5
Belgium	2	6	8	12	13	16.5
France	2	5	9	11	12	15.5
Netherlands	2	6	9	12	13	15
Southern countries						
Greece	2	6	9	12	13	16.5
Italy	2	5	8	13	14	18
Portugal	2	6	9	12	13	16
Spain	2	6	8	12	13	17

The same conversion applies to individuals and parents

of completed education are imputed in the same way for individuals as for parents, consistently with the normal (country-specific) expected length of each ISCED level.⁷

The analysis of the baseline mobility index, computed separately for each birth cohort⁸ and for each country, can give us an impression of (1) the global degree of educational persistence in Europe and (2) how educational mobility has evolved over 40 years (that is, for individuals born between 1940 and 1980). Figures 1–3 represents the temporal evolution of the mobility index for the three groups of countries respectively, with the associated empirical confidence interval in solid lines (the same information is also contained in Table 3). Moreover, the figures also report (3) the separate contribution of mobility with respect to the father and mobility with respect to the mother in dashed and dot-dashed lines, respectively.

With respect to the first point, we generally observe that the degree of educational mobility is always higher in Nordic countries than in others, with an important exception in the case of France, which shows very high levels of educational mobility over the entire period (apart from a slight decrease around the 1970s). The other Continental countries are situated in an intermediate position in our grouping of countries, although Belgium

⁷ In Table 2 we report the detailed information on the conversion of ISCED levels into equivalent years of education. Note also that we retain observations of native-born individuals who are no longer studying in the year of the survey (2005), with valid information about own, paternal and maternal completed education. We use only the sub-sample of native-born individuals because (a) we aim to relate the patterns of educational mobility to institutional changes, and (b) we want to avoid including individuals who have potentially been exposed to different institutional environments. For reasons of brevity, we neglect gender differences, which will be a subject of future research on this topic.

⁸ As in Nicoletti and Ermisch (2007) and in Mayer and Lopoo (2005) we have also tested a rolling specification, by progressively adding 1 year to each 5-year birth cohort (1940–1945, 1942–1946 and so on). However, this specification does not modify the general results, nor does it affect the temporal patterns of the mobility index (it only artificially increases the number of points in which the mobility index is calculated).

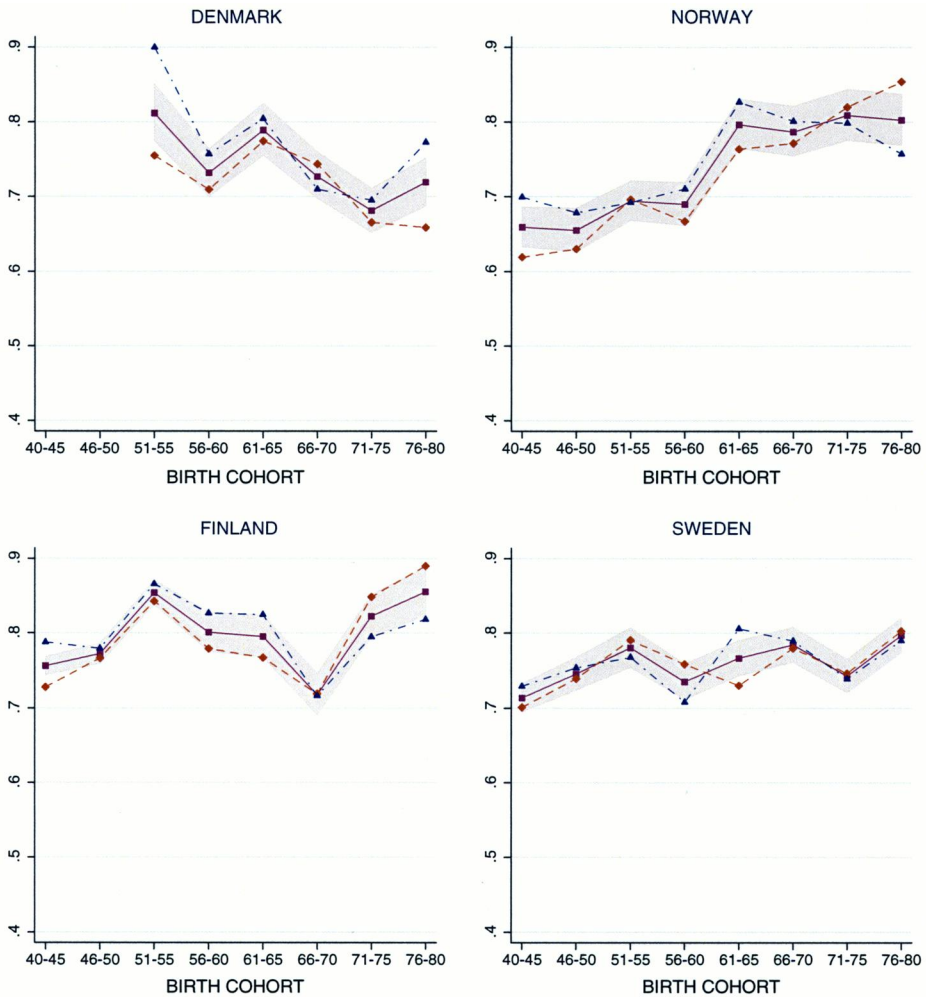


Fig. 1 Mobility index for Nordic countries. Filled square baseline mobility index; Filled triangle child versus mother mobility; Filled diamond child versus father mobility; gray shade 70 % confidence interval

displays somewhat lower levels of mobility than Austria and the Netherlands. Southern countries exhibit very low levels of educational mobility, particularly when compared with Nordic countries (apart from Greece, which shows somewhat higher levels of mobility than the rest of the group).

We could state that the temporal evolution of educational mobility generally increased over the period in the twelve European countries analysed. As also noted by Chevalier et al. (2009), however, the tendency is heterogeneous enough among countries, mainly depending on the starting-point (i.e. on the degree of educational mobility in the first birth cohort 1940–1945). In fact, for countries that exhibit high levels of mobility in the first cohorts (for example, the Nordic countries), educational mobility seems somewhat stable over the 40 years considered. As confirmation of this indication, the same occurs with France (with initial mobility close to 0.8), and to a lesser extent Austria (starting with

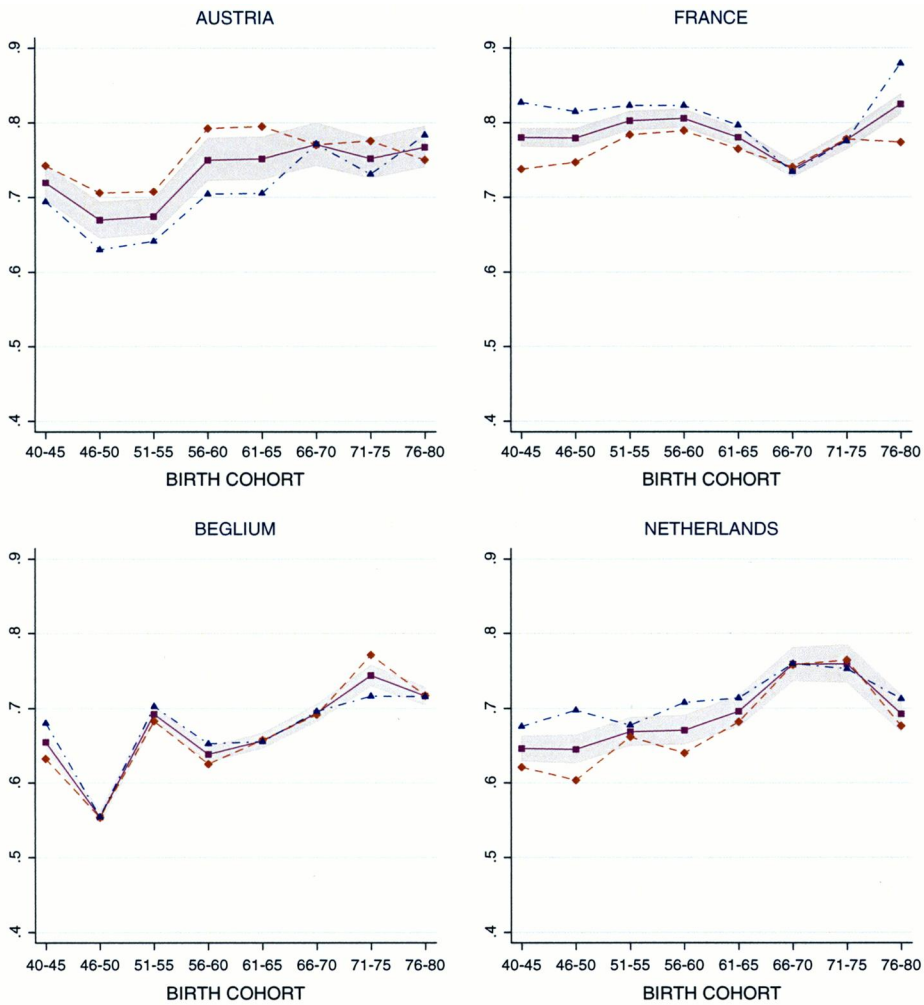


Fig. 2 Mobility index for Continental countries. Filled square baseline mobility index; Filled triangle child versus mother mobility; Filled diamond child versus father mobility; gray shade 70 % confidence interval

values around 0.7), where the evolution of educational mobility is roughly constant over the entire time span.⁹ Moreover, in the case of Denmark, the intergenerational persistence of educational attainment increases to some extent in the last cohorts (mobility reduced by approximately 0.1), probably because this country had very high levels of mobility at the beginning of the period.¹⁰ Among the Nordic countries, this common behaviour is only

⁹ Note that in the case of France we observe a moderate decrease in educational mobility from the 1956–1960 cohorts, but it increases again from 1966 to 1970, reaching its high initial levels. Moreover, in Austria there is a pronounced inflection between the 1940–1945 and the 1955–1960 cohort. However, educational mobility is essentially stable up to the end of the period.

¹⁰ Unfortunately, as noted above, we cannot provide a measure of educational mobility in the first cohorts, owing to problems with the information about completed maternal education; however, we suppose that educational mobility at the starting-point was significantly high in Denmark.

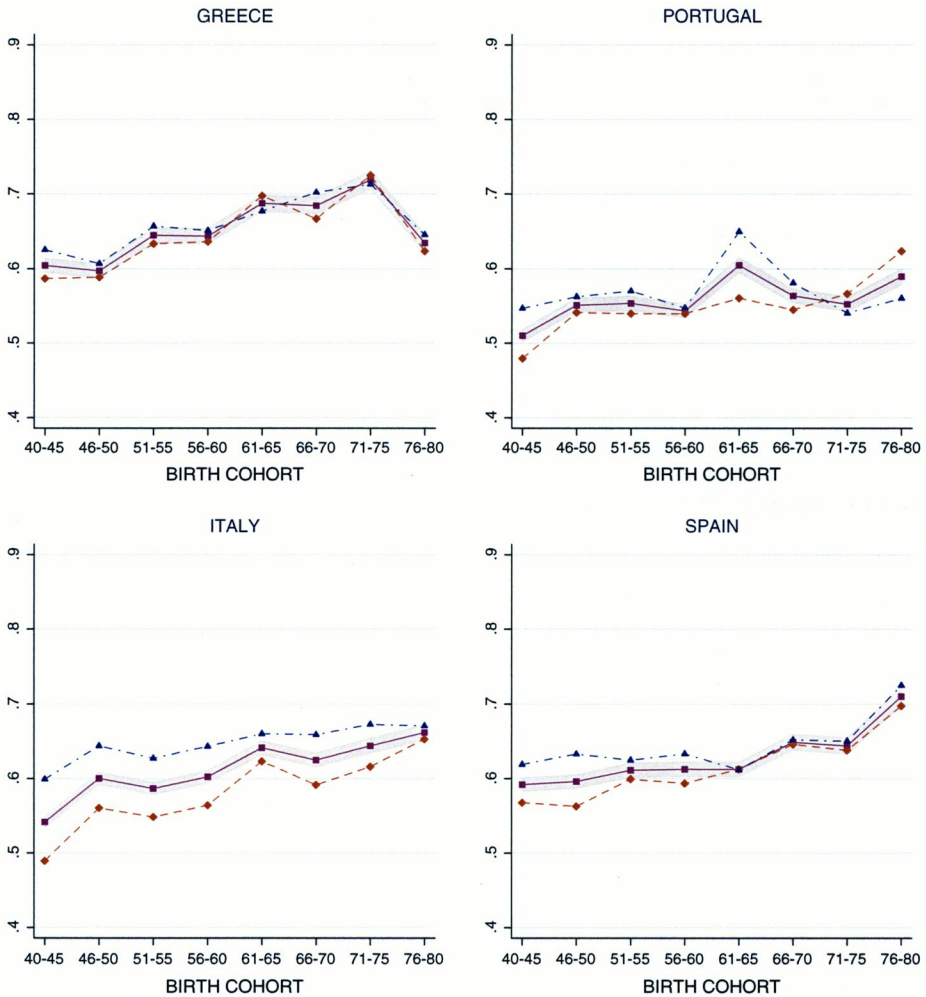


Fig. 3 Mobility index for Southern countries. Filled square baseline mobility index; Filled triangle child versus mother mobility; Filled diamond child versus father mobility; gray shade 70 % confidence interval

absent in the Norwegian case, where the initial mobility was 0.66 (lower than in the other high-mobility countries); nevertheless, in this country, mobility substantially increases over time, with an important rise of 0.1 points between 1955–1960 and 1960–1965, approaching a final value of 0.8 (mean rate of increase of 0.025 per cohort).

Additionally, we observe a moderate and stable increase in educational mobility for Belgium (apart from the fluctuation in the first three cohorts) and for the Netherlands; indeed, these countries exhibit a mean rate of increase of educational mobility of approximately 0.02 points per cohort, rising above the value of 0.7 at the end of the period.¹¹ Focusing now on the Southern countries, we note that Greece has also

¹¹ Note that in both Belgium and the Netherlands but also in Greece, educational mobility seems to decline in the last cohort (1975–1980). However, this may simply be the result of the exclusion from the sample of those individuals who were still studying in the year of the survey (2005). In all likelihood, these individuals

experienced a significant increase in educational mobility during the 40 years analysed; in this country, the average increase in the mobility index over the birth cohorts is very similar to that of the Belgian and Dutch cases (0.02 per cohort excluding the last). The increase in educational mobility is not, however, so pronounced in the other Southern countries. Indeed, Portugal exhibits the lowest general degree of educational mobility, with a remarkably low tendency to increase (apart from a discrete rise between 1955–1960 and 1965–1970). Moreover, Italy and Spain evidently experience an increase in educational mobility (an average increase of 0.014 for each cohort), but both countries maintain considerably lower levels of mobility than other European countries. It also appears that educational mobility increases in the first half of the period (probably owing to the post-war economic recovery and growth in income), and then stabilises during the second half for Italy (specifically, from the 1960 to 1965 birth cohort). Conversely, for Spain, educational mobility is roughly constant until the 1960–1965 birth cohort but rises markedly during the rest of the period considered.

Finally, we can analyse the separate contributions of paternal and maternal completed education to the global level of educational mobility and how the role of both parents changes over time. The results suggest that, in general, children's education is strongly attached to paternal education rather than to maternal education. In short, we observe higher levels of educational persistence with respect to the father than with respect to the mother, with an important exception in the case of Austria (where children's education is highly associated with maternal education). For many countries, however, the difference in mobility with respect to the father and with respect to the mother is statistically not significant for the greater part of the period, given that both fall within the confidence interval of the mobility index: this is the case with Nordic countries (with the exception of Finland¹²), but the same occurs for Belgium and Greece.

Nevertheless, for other countries, we observe a well-defined temporal convergence of educational mobility with respect to the two parents, whereby in Austria, maternal education is more attached to children's education until the 1965–1970 cohort, but mobility with respect to the mother and with respect to the father are practically identical later. With a reverse role of fathers and mothers, the convergence occurs in the same cohort for France and for the Netherlands. For Spain, the convergence between educational mobility with respect to the two parents occurs in the previous cohort, 1960–1965. Note that it is the same cohort in which educational mobility starts to increase, following the implementation of the compulsory education reform after 1970. This general convergence of mobility with respect to fathers and mothers is probably due to the tendency to balance educational attainment between males and females (in the parents' generation). Conversely, there is no convergence in the case of Italy, where children's education is more attached to paternal than to maternal education during the entire period. For Portugal, it seems that only at the end of the period does maternal education matter more than paternal education.

Footnote 11 continued

are enrolled in higher education, and dropping them from the sample may reduce the observed degree of mobility in this cohort. In fact, in order to avoid distorting the results, the mean rate of increase of 0.02 has been computed with respect to the first seven cohorts.

¹² In this country, there is a clear switch in the role of the two parents in the 1965–1970 cohort: in fact, in this cohort the child's education was previously more attached to parental education, but maternal education later has a stronger effect until the end of the period.

Table 3 Mobility index

Birth cohort	Nordic countries			
	Denmark	Finland	Norway	Sweden
1940–1945	–	0.756	0.659	0.714
1945–1950	–	0.772	0.655	0.746
1950–1955	0.811	0.854	0.694	0.78
1955–1960	0.732	0.801	0.69	0.735
1960–1965	0.789	0.795	0.797	0.766
1965–1970	0.727	0.718	0.787	0.784
1970–1975	0.681	0.823	0.809	0.743
1975–1980	0.72	0.855	0.803	0.797
	Continental countries			
	Austria	Belgium	France	Netherlands
1940–1945	0.72	0.655	0.78	0.646
1945–1950	0.67	0.554	0.78	0.645
1950–1955	0.674	0.692	0.802	0.669
1955–1960	0.75	0.638	0.805	0.671
1960–1965	0.752	0.656	0.78	0.696
1965–1970	0.771	0.694	0.738	0.759
1970–1975	0.752	0.744	0.777	0.759
1975–1980	0.767	0.717	0.824	0.693
	Southern countries			
	Greece	Italy	Portugal	Spain
1940–1945	0.604	0.542	0.51	0.592
1945–1950	0.597	0.6	0.551	0.596
1950–1955	0.645	0.587	0.553	0.611
1955–1960	0.643	0.602	0.543	0.613
1960–1965	0.687	0.641	0.605	0.612
1965–1970	0.684	0.625	0.563	0.649
1970–1975	0.719	0.644	0.552	0.644
1975–1980	0.634	0.662	0.589	0.71

4 Conclusions

In this paper we propose a new index of intergenerational mobility, which accounts for both “beta” and “R-squared” changes in educational mobility. Moreover, the proposed index enables the consideration of the global degree of mobility as the weighted sum of mobility with respect to both parents. We apply this index to a case study in which we explore the degree of educational mobility in 12 European countries and its evolution across eight birth cohorts, covering individuals born between 1940 and 1980. Exploiting the comparable cross-country information on individual and parental educational

attainment in the 2005 wave of the EU-SILC, we intend to fill the gap in comparative studies of intergenerational mobility (especially for Southern countries).

The results from the case study show that educational mobility is higher in Nordic countries and lower in Southern countries. Continental countries are situated in an intermediate position, with the unexpectedly good performance of France. Furthermore, educational mobility tends to increase in Southern countries and in some Continental countries, but is almost stable across the cohorts in Nordic countries and France. Indeed, the results suggest that educational mobility tended to rise over the 1940–1980 period only for countries with a high degree of educational persistence at the beginning of the period. Moreover, it appears that over the course of time the contribution of the members of a couple to the observed global mobility tends to converge to the same level.

The pending tasks to be considered in further research are, on the one hand, to find an explanation for these results based on the economic and institutional characteristics of the analyzed countries and, on the other, to further exploit the properties of the proposed index that have not been explored in this paper.

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