

Non-Persistent Inequality in Educational Attainment: Evidence from eight European Countriesⁱ

Richard Breenⁱⁱ, Ruud Luijkxⁱⁱⁱ, Walter Müller^{iv} and Reinhard Pollak^v

(23 November 2005)

ⁱ Paper prepared for the *Start-Up Workshop of the EDUC Research Theme of the 6th EU Framework Network of Excellence "Economic Change, Quality of Life & Social Cohesion (EQUALSOC)"*, Mannheim, Germany, 2-3 December 2005. Earlier versions of this paper were presented at the meeting of Research Committee 28 (ISA) *Inequality and Mobility in Family, School, and Work*, Los Angeles, August 18-21, 2005; at a meeting of the Inter-University Working Group on Social Inequality and Life Course, Utrecht, the Netherlands, 22 June 2005 and at the Euresco conference *European Society or Contemporary Europe? EuroConference on the Causes and Consequences of Low Education in Contemporary Europe*, Granada, Spain, 18-23 September 2004. We are grateful for comments and suggestions made at these meetings. The Swedish data used in this paper were kindly made available to us by Jan O. Jonsson.

ⁱⁱ Nuffield College, University of Oxford, e-mail: richard.breen@nuffield.oxford.ac.uk

ⁱⁱⁱ Department of Sociology, Tilburg University, e-mail: R.Luijkx@uvt.nl

^{iv} Mannheim Centre for European Social Research, e-mail: wmueller@sowi.uni-mannheim.de

^v Department of Sociology, University of Mannheim, email: rpollak@uni-mannheim.de

Abstract

In their often cited study on the development of class inequality in educational attainment in the twentieth century, Shavit and Blossfeld (1993) report remarkable stability of socio-economic inequalities over time for 11 out of 13 countries. However, for quite a few countries, Shavit and Blossfeld's findings have been challenged by more recent analyses – some using different data sources. We try to take on this puzzle and address three questions:

- (a) Are the main conclusions of *Persistent Inequality* indeed not feasible any more?
- (b) How strong are differences between countries in class inequalities in educational attainment?
- (c) Is there a common trend of educational inequality in the countries under consideration?

For the analyses, we rely on large country-specific data sets brought together by Richard Breen for his comparative study of “Social Mobility in Europe” (Breen 2004). We are able to analyze eight different countries, which cover all regions of Europe (Scandinavia, Eastern Europe, Western Europe, Southern Europe, and Central Europe). Using a cohort design for birth cohorts born between 1908 and 1972 we assess changes in the overall inequality in educational attainment within each society. In a second step, we run a common model for all countries simultaneously to assess the differences among them. We expect to find overall declining inequality in most if not all of our eight countries. We offer some suggestions about why our results contradict those of Shavit and Blossfeld and we discuss some of the issues involved in explaining our findings.

Non-Persistent Inequality in Educational Attainment: Evidence from eight European Countries.

Introduction

In their seminal study on the development of inequality in educational attainment in the 20th century Shavit and Blossfeld (1993) summarize the results under the guiding title *Persistent Inequality*. In spite of dramatic educational expansion during the twentieth century, all but two (Sweden and the Netherlands) of the thirteen countries studied in their project “exhibit stability of socio-economic inequalities of educational opportunities. Thus, whereas the proportions of all social classes attending all educational levels have increased, the relative advantage associated with privileged origins persists in all but two of the thirteen societies” (Shavit and Blossfeld 1993: 22). This conclusion is based on a meta-analysis of individual country studies all of which use two different approaches to assess socioeconomic inequalities of educational opportunities: One is to regress (with OLS models) years of education achieved by sons and daughters on parents’ education and occupational prestige; the other is to regress (with binary logistic regression) a set of successive educational transitions on the same social background variables. Change or persistence in inequalities of educational opportunities is diagnosed depending on whether or not significant change over birth cohorts is found in the regression coefficients linking social background to years of education attained and the educational transitions considered. While the two analyses address different empirical phenomena – of which Shavit and Blossfeld are well aware – the results of both suggest essentially the same conclusions, which the authors then summarize in the rather general statement of “stability of socio-economic inequalities of educational opportunities”. In the scientific community, in particular also in the education sciences, the results are received as evidence of a persistently high degree of class inequality of educational attainment that may only change under rather exceptional conditions.

However, subsequent analyses have contested this view. They have shown that equalisation also took place in Germany (Müller and Haun 1994; Henz and Maas 1995; Jonsson, Mills and Müller 1996), France (Vallet 2004), Italy (Shavit and Westerbeek 1998), and the USA (Kuo and Hauser 1995). In other studies, Breen and Whelan (1993) and Whelan and Layte (2002) confirm persistent inequality for Ireland, while for Soviet Russia Gerber and Hout (1995) find mixed results (declining inequality in secondary education, and increasing

inequality in transitions to University). For the post-socialist period in various countries of Eastern Europe, the origin-education association is regularly found to be very high and is likely higher than in the socialist period (Gerber (2000) for Russia; Iannelli (2003) for Hungary, Romania and Slovakia).

The aim of this paper is to reassess the empirical evidence concerning the main conclusion of *Persistent Inequality* with more recent data and larger samples for a selection of European countries. In contrast to Shavit and Blossfeld, we only examine one specific aspect of inequalities of educational attainment, which we think is the best compromise if one wants to study long term changes over time of inequalities of educational opportunities: Inequalities by class origin in the odds of attaining different levels of education. As in analyses of years of education obtained, the focus is on inequalities related to social origin in the educational attainment attained by the end of the educational career: this, of course, constitutes the major starting condition for unequal opportunities in the life course. But while in linear regressions the underlying association between social origin and education attained is conflated with the marginal distributions of these variables, logistic regression or log-linear models of highest educational attainment allow one to assess the association independently of marginal distributions. Second, the resulting inequality of educational opportunities is better caught through the final educational attainments of cohort members rather than through the study of educational transitions. The latter is certainly indispensable in attempts to explain why students of different class origins reach different levels of education. However, each of the transitions is just a partial element in a series of educational choices which can occur in a complex set of different educational paths, and the inequality in the final educational outcomes is difficult to establish from the sum of successive transitions because – due to the multiplicity of ways in which the final outcomes can be reached – the inequalities in the various transitions cannot easily be aggregated. Furthermore, the transition approach presupposes data on individuals' complete educational histories and these are usually not available. In their absence, researchers often have assumed that their subjects have pursued the most typical paths and have then constructed assumed transition patterns from the observed highest level of education. But particularly for countries with a highly differentiated educational system (most European countries, in fact), such constructions must give a seriously distorted picture of the real patterns of educational transitions (Breen and Jonsson 2000). For both reasons we concentrate on final educational attainments even though we can then only speculate about the specific

transitions that are mainly responsible for changing inequalities in the final attainments observed.

In the following sections of the paper we begin with a discussion of the theoretical background and a review of the changes in recent decades with respect to the social, economic and institutional conditions that can be expected to have implications for class dependent educational attainments. We then present new findings from eight European countries describing the development of class dependent inequalities in such attainments. In the conclusion we discuss the findings and their implications for future research.

Theoretical basis and historical change in conditions for primary and secondary inequality in educational attainment.

Even though we are not going to analyse the sequence of educational transitions, the theoretical explanation of aggregate unequal educational outcomes and their constancy or potential change over time has to be based on the understanding of the processes through which, by individual action, such outcomes occur. In recent theoretical work pursuing this aim, Shavit and Blossfeld's findings and conclusions have been taken as an established empirical regularity to be explained with the help of micro-theoretical models of educational transitions. The task has been conceived as requiring an explanation of the regularity of persistent inequality in most nations and of the 'deviant' national cases. Boudon's (1974) distinction between primary and secondary effects of social class and Rational Action models of educational choice (Erikson and Jonsson 1996a; Goldthorpe 1996; Breen and Goldthorpe 1997; Breen 1999; Esser 1999: 265-275) have become most prominent and convincing in such attempts. Primary effects of social origin result from differences in school performance of children from different class backgrounds, while secondary effects are due to different propensities prevailing in different classes to progress to the next educational step – even at the same level of performance. Rational Action theory is particularly useful to explain the secondary effects, and it must be emphasized that it does not necessarily imply "persistent inequality". Without doing torture to its basic theoretical assumptions and explanatory strategy, it can also accommodate increasing or declining inequality. Which one of these outcomes is realised depends on the structural or institutional constraints and incentives that drive individual action. In an imaginative way Erikson and Jonsson (1996a: 77) have shown, for the case of Sweden, how the secondary effects build on the primary ones. The higher the school marks that a child reaches at a

branching point in the educational system, the more likely he or she continues to the next educational level rather than leaving education, but at any grade level, service class children are more likely to continue than working class children. So, children from different homes (but similar performance at school) progress differently through the educational system and this produces – together with the primary effects – class differences in final educational attainment. The mechanisms seem to operate similarly at each branching point of the educational system. Most likely, they operate in similar ways in other countries and over time as well (see Jackson et al. 2005 for recent evidence for the UK). The accumulation (or interdependence) of primary and secondary factors provides the grounds for a basic similarity between countries and it also provides strong grounds for continuity over time. The mechanisms are so basic that they will tend to operate – if perhaps not with the same strength at least in the same direction – under most realistic conditions. The generation of the primary and secondary effects, however, depends on different mechanisms and conditions that produce them. What are these mechanisms and conditions and under which conditions can variation between countries or change over time be expected? In the following, we briefly discuss this question first for the primary and then the secondary effects.

As to primary effects, children raised in families in the more advantaged classes encounter better conditions in their home environments that help them to do better in school. They get more intellectual stimulation that strengthen their cognitive abilities, and they receive more parental motivation and support for schoolwork than do working class children; different performance at school may also derive from different nutrition and health in different classes; genetic differences between individuals from different class backgrounds may play a role as well as different sibship sizes. As emphasised by Bourdieu, to some extent schools probably also make it more difficult for working class than middle class children to satisfy school requirements or to receive the same performance evaluations from their teachers.

Not much comparative research exists on the operation of primary factors in different countries or their change over time. Erikson and Jonsson (1996b) assume that variation between countries is limited and that much change over time is unlikely either. Primary effects depend a lot on differences between classes in socialisation practices and the effects the latter have on cognitive development and motivation. Why should these class differentials vary substantially between countries or across time? Or why should parents in

different classes differ more in the extent to which they support their children in the UK than in France? Or why should genetic or IQ-differences vary more between classes in Sweden than in Germany or more today than fifty years ago? Erikson and Jonsson (1996b) suggest that the general improvement in conditions of living could have made working class children less disadvantaged in terms of health and nutrition. With economic development and welfare state protection the minimum standards of living have improved. Also family size has declined. Such changes should have been more relevant for families in the less advantaged classes who have been able to move out of absolute economic misery. Some decline in primary class effects should thus have occurred during the long term and substantial improvement of general living conditions in the post WWII decades of economic growth and welfare state expansion.

Differences between countries or changes over time might not only occur because class conditions per se affect academic ability and school performance differently, but also through the way the educational institutions react to class differences and may mitigate or enforce differences in children's scholastic behaviour. Differences in public provision of early childcare and pre-school education, full-day vs. part-time schooling, differences in school support to counteract performance gaps of pupils, and differences in the timing, extent and manner of tracking, all may affect class differences in school performance. The most comprehensive cross-national studies on school performance so far – the international student assessment tests in the PISA-, TIMMS-, and IGLU-studies (Baumert, Bos and Lehmann 2000; Organisation for Economic Co-operation and Development 2001; Bos 2004; Organisation for Economic Co-operation and Development 2004; Prenzel et al. 2004) reveal substantial variation between countries in the extent of class differences in the performance of pupils in reading and mathematics. The interpretation and explanation of these differences, however, is difficult, because test score differences measured at age 15 may derive from both primary and secondary effects.^{vi} While Erikson and Jonsson (1996b) have estimated about equal proportions of class differences in educational attainment to derive from primary and secondary effects, the British study seems to indicate a larger

^{vi} This is particularly true for countries with early school track differentiation. In this case, children will have studied in a class selective way in different educational tracks for years before the performance tests are taken. As in the different tracks abilities of children are formed in different ways performance observed say at age 15 results from a mixture of school effects and primary and secondary class effects impossible to disentangle without adequate longitudinal data. Studies like those of PISA would urgently need a longitudinal design to improve our understanding of cross-national differences in primary and secondary effects of social class.

share of primary than secondary effects, both of which appear to have remained pretty stable in the period since the mid 1970s in the UK.^{vii}

In attempts to understand secondary effects, rational action models of educational choice seek to show how and why class differences in transitions emerge when individuals make rational choices in their educational career, given the typical class related constraints and subjectively expected costs and benefits of the various alternatives open to them. In these models three components typically contribute to making middle class students more likely than working class students to continue to higher levels of education: They can more easily bear the costs of higher education; they expect higher rates of success in education; and they have more incentives to continue to higher education because by doing so they avoid the risk of downward mobility. Therefore it is much more likely that the benefits outweigh the costs of more education in the middle than in the working classes. A strong test would control for school performance and would involve measures of the anticipated costs, benefits and expectations of success (see Breen and Yaish forthcoming). As measurements of these are rare, we again have to rely on informed evaluation of general trends to derive expectations about changes over time. Erikson and Jonsson (1996b) have discussed the respective developments for Sweden. The observations made for Sweden may hold to some degree for other countries as well.

The most significant changes have occurred in the cost component, and most of these changes have been in the direction of declining costs. Direct costs, especially in secondary education, became smaller. School fees have been abandoned. Schools can be reached more easily because they are closer to students, and travelling has improved. In many countries, education support programs for less wealthy families have been set up, even though of rather different kinds and generosity. Average family income has strongly improved, and that should make it easier to bear the costs of education. While at least in the first half of the last century working class children were urged to contribute to the family income as early as possible, such pressures have declined. In most countries, the general economic growth and the general decline in family size have led to an increase in disposable incomes

^{vii} An interesting finding from the British study is that in more recent years children with lower performance are likely to make the transition to the next level and that the ability range, within which ability differences matter in the decision to continue education on the next step, has become smaller. While this is true for children of all class backgrounds, the differences in the ability levels at which children of different class background make the transition to the next higher level of education appear to be rather stable within the historical period observed.

beyond what is required for basic needs. In view of our concerns these improvements should have been more significant for the working classes as they especially relieved these classes from economic misery.

In practically all countries the length of compulsory schooling expanded, reducing the number of additional school years beyond compulsory education needed to reach full secondary education. Countries certainly differ in the specifics of institutional reforms, and these probably have different implications, but the lengthening of compulsory education should everywhere have contributed to a decline in the additional costs for higher education.

Countries also differ in their welfare state and social security arrangements and in their ability to prevent unemployment. In countries such as Sweden, in which serious income equalisation policies have been pursued successfully, the equalisation of conditions will have had an additional impact on reducing the class differential in the ability to bear education costs. The recurrence of high levels of unemployment in many countries since the 1980s, especially for the unskilled working class, and the increase in income inequality observed in some countries in recent years (Alderson and Nielsen 2002) are probably the most important changes that may have counteracted a long term trend towards lowering the impact of costs in producing class inequalities in educational participation.

Changes in perceived probabilities of success should mainly result from institutional reforms such as changes in the structure of tracks, timing of transition between branching points, introduction of shorter and less demanding courses of study etc. Postponing the point in the educational career at which children enter different tracks and where educational decisions have to be made will improve the ability to anticipate future educational performance. The future to be anticipated is shorter and more experience with past educational performance is available to form respective expectations for the future. The working class should profit more from such measures because the upper classes will have better knowledge about educational requirements and more confidence to fulfil them from the beginning. Many countries have taken measures in this direction, even though to a different extent and in different ways. In the course of educational expansion most countries have introduced more differentiated varieties of tertiary studies, particularly through adding shorter and more practically oriented and academically less demanding

courses of study. Expectations of success in such options should vary less between potential students from different class backgrounds than those for the longer and more academically oriented traditional varieties of tertiary education (see results from various countries in the 15-Nation Study of Expansion and Stratification in Higher Education (Arum, Gamoran and Shavit 2004)). Even though, for various reasons, it has been difficult to demonstrate that declining class inequality results from educational reforms, at least for Sweden the introduction of comprehensive education was found to have contributed to the decline in class inequality of educational attainment (Erikson 1996).

As to expected benefits from education, research does not seem to confirm expectations from modernization theory. There is no clear and general trend for the class destinations or other outcomes of education to widen systematically between individuals of different levels or kinds of education. As Breen and Jonsson (forthcoming: 10) summarize the evidence, studies in various countries “show more or less stable or even decreasing association”. However, two developments might nevertheless have contributed to a general perception of increased significance of education for one’s future position in society. With the long-term decline of farming and other forms of self-employment and with the transformation to service economies, the proportion of jobs for which education is an essential recruitment criterion has clearly increased. Consequently, the perception that education is decisive for future decent employment and job security will extend to the working class. Educational expansion has furthermore an inbuilt dynamic: Increasingly more education is needed, if only to obtain a position that earlier could be obtained with less education and this is equally true of working class as of middle class positions. This may be a main reason why increasingly more working class children decide to continue education to the secondary level and why class inequality at that level declines. However, once secondary education is successfully completed and the option to enter tertiary studies is available, some may reconsider educational plans and in fact enter tertiary education. Declining class inequality in secondary education attainment could then also lead to declining inequality in tertiary education, and this might even occur when conditional inequalities in the transition to tertiary studies grow among those who have reached full secondary education.

We have discussed primary and secondary effects and their potential change over time as if they were independent of each other. This must not be the case. Imagine that through a generous class-selective study grant programme the costs of education for the working

classes substantially decline or that continuing in education becomes attractive for financial reasons. Families and their children who did not consider higher education before might then be motivated to pursue such goals, and in order to reach them they may care more to obtain good grades at school and to fulfil the requirements for further educational steps. Class differences in school performance would equalize and primary effects decline. Conversely, if the upper classes expect increasing returns to higher education, they may invest even more in helping or pressing their children for better performance in schools.

In sum, educational costs, benefits and success expectations appear to have developed in partly opposing directions, but overwhelmingly secondary effects as well as primary effects changed in ways such that declining disparities between classes in educational attainment can be expected.

Data

Our data come from nine European countries – Germany, France, Italy, Ireland, Britain, Sweden, Poland, Hungary, and the Netherlands – and they were originally assembled for a comparative analysis of social mobility in Europe (Breen 2004). That project sought to bring together all the high quality data sets collected between 1970 and 2000 in 11 European countries that could be used for the analysis of social mobility. The data used here are identical to those employed in that project, except that the German data have been augmented by six surveys. These six surveys contain the first three German Life History Surveys for West Germany (fielded between 1981 and 1989, as well as the 2000 sample for West Germany for the German Socio-economic Panel and the ALLBUS-surveys for 2000 and 2002).

Of the countries in the original study we do not include Norway (because of problems with the coding of class origins which led to the Norwegian data being excluded from most of the comparative analyses in Breen and Luijkx (2004a; 2004b)) and Israel (because we lack information on educational attainment for the 1974 data). The data sets that we use are listed in Table 1. In total we use 120 surveys covering the period 1970 to 2002 but each country provides rather different numbers of surveys (up to a maximum of 35 from the Netherlands). In Sweden, for example, there is a survey for every year from 1976 to 1999, whereas the analyses for Italy are based on only two surveys, and for Ireland and Poland on only three surveys each. So for some countries we will be on firmer ground than for others

in respect of the amount of information we have regarding differences between cohorts, and the reliability of the conclusions based on this information will clearly vary between countries. All else equal we must, as a consequence, attach more credence to results about temporal trends drawn from countries with a larger number of observations (Sweden, the Netherlands, Great Britain and Germany). Furthermore, for Sweden and Great Britain, the surveys come from one series, whereas for Germany, we use data from six different survey series and for the Netherlands we make use of many different survey sources.

[TABLE 1 HERE]

We use data on men aged 30-69. We adopt 30 as the lower age limit to ensure that everyone in the samples will have attained their highest level of education. We confine our analysis to men because the inclusion of both sexes, and comparisons between them, would have made a long paper excessively so. We intend to analyze educational inequality among women, and compare it with the results reported here, in a further paper.

Variables

We use four variables in our analysis. Cohort (C) defines five birth cohorts: 1908-27, 1928-37, 1938-47, 1948-57 and 1958-72. Thus our analysis covers the first three-quarters of the 20th century. In Poland, however, we have only four cohorts: we do not analyse the youngest cohort because of the small number of observations. Survey (S) defines the five-year interval in which the data were collected: 1970-74, 1975-79, 1980-84, 1985-89, 1990-94, 1995-1999, and 2000-2004.

Highest level of educational attainment (education (E), for short) is measured using the CASMIN educational schema (see appendix table 1). We have amalgamated categories 1a, b and c, and also 2a and b, giving us five educational categories:

- 1abc (compulsory education only),
- 2ab (secondary intermediate education, vocational and general),
- 2c (full secondary education),
- 3a (lower tertiary education), and
- 3b (higher tertiary).

In the Irish data no distinction has been made between 3a and 3b, and so here we have only four educational categories. Elsewhere we have preserved this distinction because much of the recent expansion in tertiary education in many countries has been at level 3a rather than 3b, and it may thus be that inequality in access to 3b has remained high. The CASMIN educational schema seeks to capture distinctions not only in the level of education, but also in its type, and one consequence of this is that the five levels we identify cannot be considered to be hierarchically ordered in any simple way. For example, in some countries lower tertiary education can be accessed directly from secondary intermediate education, while, in most countries, higher tertiary is not usually entered after lower tertiary.

Class origins are categorised using the EGP class schema (see appendix table 2; also Erikson and Goldthorpe 1992, chapter 2). This identifies seven classes:

- I (upper service),
- II (lower service),
- IIIa (higher grade routine non-manual),
- IVab (the self employed and small employers),
- IVc (farmers),
- V+VI (skilled manual workers, technicians and supervisors) and
- VIIab+IIIb (unskilled manual and lower grade routine non-manual workers).

In Britain and Poland the data allow us to identify only six class origins. In both countries we cannot distinguish classes I and II, while, in Britain, members of IVa are included in I+II (see Goldthorpe and Mills (2004)). Furthermore, in Poland, we cannot split class III so here IIIb is included with IIIa rather than with VIIab.

The resulting four-way table of class origins (O) by educational attainment (E) by cohort (C) by survey (S) is of maximum dimensions $7 \times 5 \times 5 \times 7 = 1225$, though this number includes many structural zeroes in those combinations of cohort and survey which are not observed. Furthermore, we omitted all those observations of cohort by survey in which the table of origins by education would have been extremely sparse. All the cells in such a table were treated as structural zeroes.

Table 2 shows the resulting sample sizes for all the countries by cohort. These vary quite considerably and this will obviously affect our ability to detect statistically significant

trends. The sample sizes for Italy and Ireland are particularly small. One further issue that needs to be kept in mind when drawing comparisons between countries and over time concerns the distribution of birth years among men in the oldest and youngest cohorts. In the British case, data were collected on parental occupation only from men aged less than 50. Because our first survey from Britain comes from 1973 this means that the oldest men in our data were born in 1924, and hence the 1908-27 cohort here actually comprises men born between 1924 and 1927. For Italy our first survey comes from 1985, and thus the oldest cohort here comprises men born between 1916 and 1927. In the other countries we have observations of men born throughout the 1908-27 interval. Turning to the youngest cohort, once again Britain presents a difficulty inasmuch as the final survey that we have comes from 1992, and so we do not have observations on anyone born after 1962 and so the final cohort, rather than being made up of men born between 1958 and 1972 actually spans only a five-year period. This problem of the truncation of the youngest cohort occurs in several other countries too: in France we have observations covering the years 1958-63, in Italy 1958-67, in Ireland and Poland 1958-1964, in Sweden and the Netherlands 1958-1969, and in Hungary 1958-70. In total, we observe men born over an interval of 65 years in Germany, 62 or 63 years in Sweden, Hungary and the Netherlands, 56 or 57 years in France and Ireland, 52 years in Italy, 50 years in Poland (because we omit the youngest cohort because of small numbers) but only 39 years in Britain.

[TABLE 2 HERE]

Changes in educational attainment and class origins

Perhaps the single most striking thing that differentiates the older from the younger cohorts in our data is the massive increase in educational attainment that has occurred. Figure 1 shows the percentages in each cohort in each country that have attained at least upper secondary (2c) education, while Figure 2 shows the percentages who have attained tertiary (3a and 3b) education.^{viii} The upward trends in both are obvious and are similar across countries.

[FIGURES 1 AND 2 HERE]

^{viii} At this point we omit Hungary from our comparison: the reasons for this are given in the next section of the paper.

It is not only the educational distributions that have changed, however. During the course of the twentieth century, the class structures of European nations underwent major change, with a shift away from farming and unskilled occupations towards skilled jobs and white-collar jobs. Some aspects of this shift are shown in Figure 3, which shows the share of the service class (I and II), intermediate class (IIIa and IVab), the farm classes (IVc and VIIb) and working class (V+VI, VIIa+IIIb) in the origins of the oldest and youngest cohorts in each country. The decline of the farm class and growth of the service class are evident everywhere and the working class has grown or remained stable everywhere except Britain.

[FIGURE 3 HERE]

Analyses

We carry out several sets of analyses, the first of which attempts to assess the quality of our data, and leads us to reject the data from Hungary. We then turn to the main object of the paper and model the trend over cohorts in the strength of the association between class origins and highest level of educational attainment (educational inequality, in other words) in the eight remaining countries. Then we move to international comparisons and we use a relatively simple method to compare the strength and the trends in educational inequality.

Assessing the quality of the data

The structure of our data, and the choice of the age range of 30 to 69 for our samples, allow us to assess the quality of our data in a way that is not normally possible. Among any sample of adults, their class origins are fixed, while the acquisition of further educational qualifications after the age of 30 is rare in all societies. As a result, if we had longitudinal data, we could assess the reliability of measures of class origins and of educational attainment by comparing individuals' responses at different points in time (a strategy which was used by Breen and Jonsson (1997) to measure reliability in reports of class origins). In our case, rather than longitudinal data, we have repeated cross sections, so that different surveys will contain samples from the same birth cohort. Nevertheless, under certain conditions^{ix}, we should still expect that variation between surveys within the same birth

^{ix} The most important condition is that the samples should be drawn from the same population. This condition could be violated by mortality (though, given our age range, this is unlikely to be important) and by migration. Over the last decades of the twentieth century, Ireland, for example, experienced substantial immigration and emigration, and several other of our countries have experienced the former. Another condition is that the various surveys in a country should sample the population in the same way. As we noted

cohort in the distribution of education and class origins should not exceed what we would expect on the basis of sampling variability. Thus we can use the fact that our data consist of samples from the same cohorts at different periods to check whether (a) the marginal distributions of education and class origins remain constant (within the limits of sampling variability); and (b) whether the association between these variables is also constant.

To do this we fit four log-linear models to the four way tables of class origins (O) by educational attainment (E) by cohort (C) by survey (S) in each of our nine countries, as shown in Table 3. All four models allow the origin – education association to vary over cohorts (the COE term), and also allow the distribution of cohorts to vary over surveys (the CS term). Our interest is in whether the CO, CE and OE relationships vary over surveys. In model 1 none of them does; in model 2 the distribution of class origins in each cohort is allowed to differ over surveys; in model 3 so is the distribution of education; and in model 4 we allow the association between origins and education to vary over surveys.^x We assess the goodness of fit of the various models using the likelihood-ratio test (measured by G^2) and we take $p=.05$ as our significance level. The table also shows the index of dissimilarity (Δ) for each model and likelihood ratio tests comparing the goodness of fit of selected pairs of models.

[TABLE 3 HERE]

Model 1 fits the data in five countries: France, Italy, Ireland, Poland and Sweden, and in the first four of these it is the preferred model, while in Sweden, model 3 is preferred. In this case, model 2 is not a statistically significant improvement on model 1, whereas model 3 is an improvement over both, indicating that, although in Sweden the class origin distribution does not vary for a given cohort over surveys, the distribution of educational attainment does. Model 3 also fits the German data, but in this case, model 4 is preferred. In Britain model 3 comes very close to fitting the data ($p=.048$) but, once again, model 4 is preferred. The same is true in the Netherlands, where model 3 just fails to fit the data ($p=.039$) while model 4 does fit the data. In Hungary the situation is, from our point of view, a little worse,

earlier, in many of our countries (France, Britain, Hungary and Sweden, and, for the most part, Germany) the data are drawn from the same survey, but this is not true of Italy, Ireland, Poland and the Netherlands.

^x This means that the origin – education association differs across surveys *within* cohorts, but this survey effect is the same in all cohorts.

because, as in Britain and the Netherlands, model 4 fits the data, but model 3 is very far from fitting it.

These four cases are thus somewhat problematic, because the preferred model in Germany, Britain, Hungary and the Netherlands (model 4) says that both the marginal distributions and the origin – education association are not constant within cohorts over surveys. On the other hand, because our aim is to model the association between class origins and educational attainment in each cohort, what we really need to know is whether, within each separate cohort, this association varies over surveys. We can test this straightforwardly by fitting, to the observations of each cohort, the model of common (across surveys) association between origins and education.^{xi} The results are in Table 4 and they show that for Britain and the Netherlands there is no evidence for significant change in the origin – education association in any cohort (the model of common association fits the data), while in Germany there is change in the oldest cohort. But in Hungary the association changes in three out of five cohorts. These results are not unexpected, given that, in Table 3, model 3 fitted or almost fitted the German, British and Dutch data but not the Hungarian. We therefore retained the German, British and Dutch data for our analyses but not the Hungarian.

[TABLE 4 HERE]

Modelling the data

We noted earlier that the educational categories we use do not have a single hierarchical ordering, and so the Mare (1980; 1981) model of educational transitions would not be appropriate. Furthermore, because we lack data on the educational pathways that individuals followed, we could not apply the extended educational transition model of Breen and Jonsson (2000). We focus, therefore, on modelling the joint distribution of class origins and highest level of education attained in the eight countries remaining in our data set.

In Table 5 we report on three models fitted to these data in each country. The first model is constant origin – education association across cohorts (OE CSO CSE). The second model is the log-multiplicative layer effect, or unidiff, model (Erikson and Goldthorpe 1992; Xie

^{xi} Though, obviously, we can do this only in respect of cohorts that have been observed twice or more.

1992), written as $\beta_{\text{COE CSO CSE}}$, which indicates that the origin – education association varies over cohorts log-multiplicatively. Letting $i = 1, \dots, I$ and $j=1, \dots, J$ index origins and education, respectively, and $k=1, \dots, K$ cohorts, this model can be expressed as

$$\ln \theta_{ijk} = \beta_k \ln \theta_{ij} \quad (1)$$

Here θ_{ijk} denotes the odds ratio

$$\frac{F_{ijk} / F_{ij'k}}{F_{i'jk} / F_{i'j'k}} \quad (2)$$

where F_{ijk} is the fitted value in the ijk^{th} cell of the three-way table, β_k is a cohort specific multiplier, and we set $\beta_1 = 1$. The model says that the difference in the log odds ratios, involving origins and education, between any two cohorts is proportional to the difference in their β parameters and thus declining values of this parameter over cohorts correspond to a weakening in the association between origins and education. This is a very parsimonious model, which captures change in a single parameter, but its parsimony comes at the price of the restrictive assumption that proportionality between the odds ratios within the origin – education table is constant over all cohorts. The third model in Table 5 allows the origin – education association to evolve over cohorts in an unrestricted fashion (COE CSO CSE). This is model 3 of Table 3 and it is, in fact, a multinomial logit model for highest level of education attained.

[TABLE 5 HERE]

The constant association model fits the data in only one case – Italy – but even here the multinomial logit model, model 3, provides a better fit. Unidiff fits the German, Italian and Swedish data but, the multinomial logit is preferred in the Italian and Swedish case, while, in France, Ireland and Poland, the latter is the only model that fits the data, and in Britain and the Netherlands this model comes close to fitting (and we have already seen that in these countries there are no significant departures from this model within each birth cohort). Model 3 thus provides the basis for the main conclusions we draw about changes across cohorts.

Nevertheless, unidiff, despite never being our preferred model of change across cohorts, fares well in terms of the index of dissimilarity, and it has the great advantage of allowing us to get some general sense of the trend in the association between class origins and educational attainment. In Figure 4 we report the unidiff coefficients for birth cohorts in each of our eight countries. Here each country is allowed to have its own pattern of origin – education association (θ_{ij} in equation 1) and has a value of 1 for the strength of this association in the oldest cohort, and so Figure 4 cannot be used to draw comparisons between countries in the strength of their association between origins and education. But what is clearly evident in the figure is that there is a general tendency for the association to weaken, with only two exceptions: Ireland and Italy. This is at least prima facie evidence that the hypothesis of persistent inequality is incorrect.

[FIGURE 4 HERE]

The more detailed results from model 3 of Table 5 are reported in two slightly different ways in Figures 5 and 6, both of which have the same structure. Each row of a figure refers to a given country, and each column is concerned with a particular comparison of educational levels. The lines in each figure refer to classes, and the points on each line are the values for different cohorts, with time on the x-axis. The values themselves (on the y-axis) are the log-odds ratio of attaining the given level of education, relative to the comparison level, for each class, where class I always taken as the reference category: hence the line for class I is always flat at the value zero. For example, the top left graph in Figure 5 refers to Germany, and the odds ratio in question is between attaining a level of education of 2ab rather than 1abc. The lines show how the log of the odds ratio has evolved over cohorts in a particular class compared with class I. In general, the lines show a tendency to slope upwards, so that, by the fifth and youngest cohort, the differences between these lines and the flat line for class I is much less than it was in the oldest cohort, indicating a general decline in class inequalities.

[FIGURES 5 AND 6 HERE]

The graphs in Figure 5 show log odds ratios that always take educational level 1abc as their reference category and compare this with a single other level of education, whereas those in Figure 6 compare different combinations of educational levels. So, the graphs in column 1

of Figure 6 take educational level 1abc as their reference and compare this with attaining a level of education of 2ab or higher, and those in column 2 compare the attainment of 2c or higher with the attainment of 1abc or 2ab. Column 3 compares 3a or 3b with 2c or less, and column 4 compares 3b with 3a or less.

The graphs in Figures 5 and 6 are all derived from the fitted values generated by model 3 of Table 5. The difference between them, however, is that whereas the log odds ratios shown in Figure 5 depend only on the estimated association between origins and educational levels, those of Figure 6 also depend on the margins of the tables because they form contrasts between sums over educational categories.^{xii} Thus the results of Figure 5 refer to what Mare (1981: 74) called 'genuine differences' in the association between class origins and educational attainment, while those of Figure 6 do not. Despite this, the two sets of graphs are remarkably similar.

The comparisons between different attainments in Figure 5 – always compared to the lowest level of compulsory general education with or without basic vocational training (1abc) – indicate the extent to which the various attainments are more or less class selective. As one should expect, class effects are larger the greater the difference between the two educational levels being compared. In all countries they are smallest when comparing 1abc attainment with secondary intermediate attainment and in all countries class selectivity is largest in comparisons involving academic tertiary attainment (3b). In most countries class effects appear substantially larger for higher tertiary academic attainment (3b) than for the more vocationally oriented lower tertiary attainments (3a) that often can be reached through less demanding or less strictly academic routes.

In Figure 6 the development of educational inequality is measured in view of a series of educational thresholds. The graphs show class inequality in the odds of reaching at most the given threshold or attaining an educational level beyond the threshold. There is a slight tendency of growing inequality if the threshold is set at a higher level of attainment. But, by and large, the extent and class pattern of inequality observed at higher threshold levels is very similar to that observed at the very first threshold of moving beyond 1abc education,

^{xii} The absences in Figure 5 are due to (a) in Italy we have no observations of individuals from Class I at educational level 2ab in the oldest cohort or at level 3a in any except the youngest cohort; (b) in Ireland we have no observations of class I in 1abc in the youngest cohort; (c) in Sweden we have no observations of 2ab in the youngest cohort.

and when inequality between two cohorts declines at that transition it also declines at higher threshold levels.

Figures 5 and 6 confirm the decline of inequality (except in Italy and Ireland) already shown in figure 4 and the regularity in the class patterns indicate that the assumption of proportional decline cannot be far from truth. The irregularities found in some cohorts in Italy and Ireland (where children from lower service class background seem to exceed those of upper service class background) probably result from the small sample sizes in these countries. In Great Britain, inequality appears to have declined at lower levels but not at the tertiary level. In the latter respect, the service classes (that are combined in the British dataset) appear to have conserved their educational advantage compared to other classes. From detailed inspection of the British data one furthermore sees that the position of sons from routing non-manual class homes has deteriorated in the most recent cohort and is now rather similar to that of working class children.

Figures 5 and 6 also allow comparisons across countries in the extent of inequality – though bearing in mind that in Great Britain and Poland classes I and II are not distinguished in the data, and that these two classes combine to form the reference category for comparisons with classes. With this combined reference class the resulting class contrasts in Great Britain and Poland will be smaller than in the other countries where the service class I alone is used as reference. Considering this, it is safest to exclude, at this stage, the two countries from comparisons. Among the remaining countries Sweden and the Netherlands show less inequality in all the comparisons shown (the lines for the different social class origins are closer together) and for all cohorts studied, but they are not special with respect to the decline in inequality that is also observed in France and Germany, and, to a less marked degree, in Great Britain and Poland.

Cross national comparisons

It is tempting to make simple cross-national comparisons of educational inequality, though their usefulness is limited by the fact that actual differences between nations are complex and such comparisons are at best a partial reflection of this. Nevertheless, we yielded to temptation. Our first step in making such a comparison was to render the data sets more comparable than hitherto. Because the Irish data has only four educational categories we reduced the number of educational categories in every country to four by combining 3a and

3b (lower and upper tertiary education); and because the British data combines class origins I, II and IVa we combined these in all the other countries too. To make a comparison based on a single number for each cohort within each country we first needed a single number summary of educational inequality within each of these – and this is provided by the unidiff model. We then had to make these coefficients comparable across nations. One possibility would have been to weight the unidiff β s by some function (the mean or median, perhaps) of the odds ratios for the particular country. Our preferred solution was, instead, to force the pattern of odds ratios to be the same across all countries and allow this association to vary freely over all nation by cohort combinations in the data.^{xiii} This yielded 39 coefficients which – conditional on the accuracy of the assumption of a common pattern of association – tell us how educational inequality varies over cohorts and countries. The results are presented in Figure 7. The β coefficients are standardized by setting the one for the oldest German cohort equal to one.

[FIGURE 7 HERE]

A comparison of the trends for each country shown in Figure 7 with those in Figure 3 suggests that the assumption of a common pattern of association in all countries induces very little inaccuracy in the conclusions we would draw about such trends. The only country for which the two figures show any noticeable difference is the Netherlands, where, in Figure 4, the youngest cohort displays the same level of inequality as the second-youngest, while in Figure 7 it displays rather more. But further analyses showed that this change is entirely the result of the combining of class origin IVa with I and II.^{xiv}

Figure 7 shows that the distinction, evident in the older cohorts, between highly unequal countries (such as Germany, France and Poland) and the more equal ones (Britain, Sweden and the Netherlands) has diminished somewhat, partly because the biggest declines in inequality have been registered in the countries with greater initial inequality. Once again, Italy and Ireland prove to be exceptions. That Sweden has always shown the lowest origin – education association is no surprise, but the high degree of openness in Britain may be. But this may owe a good deal to the fact that the first cohort for Britain was born between 1924

^{xiii} Omitting the survey variable, S, and letting N indicate country, we can write this model as $\beta_{CN}OE CNO$ CNE, showing that the OE association varies log-multiplicatively over all C by N combinations.

^{xiv} Using the chi-squared criterion this model is a long way from fitting the data ($G^2= 1938$ on 532 df) but its index of dissimilarity is only 2.7 per cent.

and 1927 (as we noted earlier) rather than between 1908 and 1927 as in most other countries.

Conclusions

Social class disadvantages in children's educational careers have become less acute in six out of eight of the countries we studied, though this decline has been more pronounced in some countries (Sweden, the Netherlands, Germany and France) than in others. The two countries where we found no decline – Italy and Ireland – present a rather unclear picture of the trend in inequality, and one suspects that this is due to the small sample size in these two cases. The decline that we observe for the most part took place during a relatively short period of around 30 years in the middle of the century, between the oldest cohort (born 1908-27) and the second youngest (born 1948-57), though there is some variation in the timing of this decline. In Germany, Britain and Sweden it spanned the 30-year period (and, in the Swedish case, continued beyond it), whereas in Poland it ceased after the 1938-47 cohort and in France and the Netherlands it began later, occurring between the 1927-36 and 1948-57 cohorts. Between the 1948-57 cohort and our youngest cohort (born 1958-72) we see no further decline (except in Sweden) and, in some countries (Poland, Germany and Britain), there are suggestions that the association between origins and education may have begun to strengthen again, though it would be unwise to be too confident about this reversal of the trend, given that in all cases it is based on the observation of one cohort of which we have rather few observations (recall that, for example, in the British case we observe this cohort only between 1958 and 1962 and in Poland only up to 1964).

In the light of our findings, the “Persistent Inequality”-thesis is evidently challenged, and the prevailing view that class inequalities in educational attainment will only decline under exceptional circumstances must be reconsidered. An immediate question, however, is why the present results differ so clearly from the results found a decade ago. It is certainly not because our analyses cover a different set of cohorts: there is considerable overlap in the period spanned by our cohorts and those in the studies collected in Shavit and Blossfeld (1993). It is true that our analyses also include some younger cohorts, but their inclusion cannot be responsible for our results since, by and large, there is little or no change in inequality between our second-youngest and youngest cohorts. A more likely source of the discrepancy is methodological: several of the country studies` in *Persistent Inequality* are based on rather small samples and may have lacked the statistical power to find change

over time. Random fluctuation in the small samples that were available for each cohort may have been larger than the systematic change that occurred from cohort to cohort. We used our data to draw 100 random sub-samples from the data for each country included in our analysis and in *Persistent Inequality* (Germany, Italy, Britain, Sweden, Poland and the Netherlands) corresponding in size to the samples used for the analyses in the latter. To each of these sub-samples we fitted the unidiff model of change over cohorts and the results are graphed in Figure 8.

[FIGURE 8 HERE]

In the two cases where *Persistent Inequality* reports a weakening of the origins -education association, namely Sweden and the Netherlands, Figure 8 shows that it would be impossible to draw, from our data, a sample of the size used there that did not show such a weakening. Conversely, in the other four countries, from sub-sample to sub-sample there is a high degree of instability in the pattern of results (particularly noticeable in the Italian case) and it would therefore be quite possible to draw a sample that showed no significant change even in those three cases (Germany, Britain and Poland) where we know that such change occurred. Of course, we are not here drawing samples from the population, so the conclusion we can draw is not as strong as it would be in that case: nevertheless, this exercise strongly suggests that *Persistent Inequality* may have failed to find change in some countries because the samples used there were too small.

Another likely source of difference is that measures of core variables differ between *Persistent Inequality* and the present study. Most of the *Persistent Inequality* chapters use father's job prestige as their indicator of social origin. Müller and Haun (1994) reanalysed a subset of the German data used in the present study with prestige as the measure of parental occupation and found that it is less powerful than the class measure. They also found less indication of decline over time with this indicator. It is also worth noting that the three analyses in *Persistent Inequality* that measure social origins using social class find the same results as us (change in Sweden and the Netherlands and no change in Italy). Finally, as we noted earlier, several single country studies published since 1993 have found declines in inequality of the kind we report here as did Rijken's (1999) comparative analysis.

Even given that the weight of evidence now supports the thesis of a declining association between class origins and educational attainment, it may be argued that to interpret this

trend as demonstrating an increase in equality is mistaken because education is a positional good. In this case, the value of an educational qualification diminishes in proportion to the number of people who acquire it. But for this argument to have any force it is not enough to show that, over time, the value of some qualification declines: rather, it must be demonstrated that differences between the returns to educational level diminish. The issue is not whether the returns to a tertiary qualification are less in one cohort than in an older one, but whether the gap in returns between a tertiary and an upper secondary qualification, for example, have narrowed. As far as we know, there is no such evidence, and, indeed, there are good grounds for supposing that, as the number of graduates increases, young people with only an upper secondary qualification will be forced to take less attractive jobs than their counterparts in older cohorts.

A potentially more telling objection to the argument that declining association implies declining class inequality is that there may be distinctions within the broad CASMIN educational categories that are consequential for life chances. For example it is commonly the case that differences exist between classes in their choice of particular subjects of study or field of education. If these differences have become stronger as inequalities in level of education have declined (Lucas 2001; Van de Werfhorst 2001; Kim and Kim 2003) then a focus solely on educational level will over-estimate the extent to which inequalities have declined. Nevertheless, it is difficult to believe that inequalities stemming from differences in field of study within a given level of education will be as important for variations in life chances as differences between the levels of education attained.

Our results present a challenge for theory, because a lot of theorizing on educational differentials has been built around the assumed social regularity of *Persistent Inequality*. Theoretical work will now have to clarify why declining inequality is more common than so far assumed. In the introductory section of this paper we outlined some mechanisms with the potential to influence educational inequality: one means of explaining our results would be to answer the question of which (and in what way) these mechanisms changed in the different countries to bring about the trends that we observe. Perhaps the most far-reaching attempt to do something along these lines is available for Sweden (Erikson 1996), where it is found that the introduction of comprehensive schooling and variation in economic conditions, notably declining income inequality, low levels of unemployment and generous financial aids to students have all contributed to a decrease in inequality of educational

opportunity. All these factors are closely tied to the Swedish egalitarian educational and welfare state policy. But, clearly, educational inequality can decline under other conditions: there are, for example, considerable differences between the Swedish comprehensive school system and the strongly tracked German educational system. Determining exactly what factors played a role in the remaining seven countries in our study is a demanding task for further research.

References

- Alderson, Arthur S., and François Nielsen. 2002. "Globalization and the Great U-Turn: Income Inequality Trends in 16 OECD Countries." *American Journal of Sociology* 107:1244-1299.
- Arum, Richard, Adam Gamoran, and Yossi Shavit. 2004. "More Inclusion than Diversion: Findings from a 15-Nation Study of Expansion and Stratification in Higher Education." A paper prepared for presentation at the meetings of the Research Committee on Social Stratification (RC28) of the International Sociological Association Rio de Janeiro, Brazil, August 2004.
- Baumert, Jürgen, Wilfried Bos, and Rainer Lehmann (Eds.). 2000. *TIMSS/III, dritte internationale Mathematik- und Naturwissenschaftsstudie: mathematische und naturwissenschaftliche Bildung am Ende der Schullaufbahn*. Opladen: Leske + Budrich.
- Bos, Wilfried. 2004. *IGLU : einige Länder der Bundesrepublik Deutschland im nationalen und internationalen Vergleich*. Münster: Waxmann.
- Boudon, Raymond. 1974. "Educational Growth and Economic Equality." *Quality and Quantity* 8:1-10.
- Breen, Richard. 1999. "Beliefs, Rational Choice and Bayesian Learning." *Rationality and Society* 11:463-480.
- (Ed.). 2004. *Social Mobility in Europe*. Oxford: Oxford University Press.
- Breen, Richard, and John H. Goldthorpe. 1997. "Explaining Educational Differentials: Towards a Formal Rational Action Theory." *Rationality and Society* 9:275-305.
- Breen, Richard, and Jan O Jonsson. 1997. "How reliable are studies of social mobility? An investigation into the consequences of errors in measuring social class." *Research in social stratification and mobility* 15:91-112.
- . 2000. "A Multinomial Transition Model for Analyzing Educational Careers." *American Sociological Review* 65:754-772.

- . forthcoming. "Inequality of opportunity in comparative perspective: Recent research in educational attainment and social mobility." *Annual Review of Sociology*.
- Breen, Richard, and Ruud Luijkx. 2004a. "Social Mobility in Europe between 1970 and 2000." Pp. 37-75 in *Social Mobility in Europe*, edited by Richard Breen. Oxford: Oxford University Press.
- . 2004b. "Conclusions." Pp. 383-410 in *Social Mobility in Europe*, edited by Richard Breen. Oxford: Oxford University Press.
- Breen, Richard, and Christopher T. Whelan. 1993. "From Ascription to Achievement? Origins, Education and Entry to the Labour Force in the Republic of Ireland during the Twentieth Century." *Acta Sociologica* 36:3-18.
- Breen, Richard, and Meir Yaish. forthcoming. "Testing the Breen-Goldthorpe model of educational decision making." in *Frontiers in Social and Economic Mobility*, edited by Stephen L. Morgan, David B. Grusky, and Gary S. Fields: Stanford University Press.
- Erikson, Robert. 1996. "Explaining Change in Educational Inequality - Economic Security and School Reforms." Pp. 95-112 in *Can Education Be Equalized? The Swedish Case in Comparative Perspective*, edited by Robert Erikson and Jan O. Jonsson. Boulder (Colorado): Westview Press.
- Erikson, Robert, and John H. Goldthorpe. 1992. *The Constant Flux: a Study of Class Mobility in Industrial Societies*. Oxford: Clarendon.
- Erikson, Robert, and Jan O Jonsson. 1996a. "The Swedish Context: Educational Reform and Long-Term Change in Educational Inequality". Pp. 65-93 in *Can Education Be Equalized? The Swedish Case in Comparative Perspective*, edited by Robert Erikson and Jan O. Jonsson. Boulder (Colorado): Westview Press.
- Erikson, Robert, and Jan O. Jonsson (Eds.). 1996b. *Can Education Be Equalized? The Swedish Case in Comparative Perspective*. Boulder (Colorado): Westview Press.
- Esser, Hartmut. 1999. *Soziologie. Spezielle Grundlagen. Band 1, Situationslogik und Handeln*. Frankfurt a. M./New York: Campus Verlag.
- Gerber, Theodore P. 2000. "Educational stratification in contemporary Russia: Stability and change in the face of economic and institutional crisis." *Sociology of Education* 73:219-246.
- Gerber, Theodore P., and Michael Hout. 1995. "Educational Stratification in Russia During the Soviet Period." *American Journal of Sociology* 101:611-660.

- Goldthorpe, John H. 1996. "Problems of 'Meritocracy'." Pp. 255-287 in *Can Education Be Equalized? The Swedish Case in Comparative Perspective*, edited by Robert Erikson and Jan O. Jonsson. Boulder (Colorado): Westview Press.
- Goldthorpe, John H., and Colin Mills. 2004. "Trends in intergenerational class mobility in Britain in the late twentieth century." Pp. 195-224 in *Social Mobility in Europe*, edited by Richard Breen. Oxford: Oxford University Press.
- Henz, Ursula, and Ineke Maas. 1995. "Chancengleichheit durch die Bildungsexpansion." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 47:605-633.
- Iannelli, Cristina. 2003. "Parental Education and Young People's Educational and Labour Market Outcomes: A Comparison across Europe." in *School-to-Work Transitions in Europe: Analyses of the EU LFS 2000 Ad Hoc Module*, edited by Irena Kogan and Walter Müller. Mannheim: Mannheimer Zentrum für Europäische Sozialforschung.
- Jackson, Michelle, Robert Erikson, John H. Goldthorpe, and Meir Yaish. 2005. "Primary and Secondary Effects in Class Differentials in Educational Attainment: the Transition to A-level Courses in England and Wales." Oxford: Paper presented to the Royal Statistical Society.
- Jonsson, Jan O., Colin Mills, and Walter Müller. 1996. "Half a Century of Increasing Educational Openness? Social Class, Gender and Educational Attainment in Sweden, Germany and Britain." in *Can Education be Equalized*, edited by Robert Erikson and Jan O. Jonsson. Boulder (Colorado): Westview Press.
- Kim, Anna, and Ki-Wan Kim. 2003. "Returns to Tertiary Education in Germany and the UK: Effects of Fields of Study and Gender." *Arbeitspapiere* 62. Mannheim: Mannheimer Zentrum für Europäische Sozialforschung.
- Kuo, Kuo Hsiang-Hui Daphne, and Robert M. Hauser. 1995. "Trends in Family Effects on the Education of Black and White Brothers." *Sociology of Education* 68:136-160.
- Lucas, Samuel R. 2001. "Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects." *American Journal of Sociology* 106:1642-1690.
- Mare, Robert D. 1980. "Social Background and School Continuation Decisions." *Journal of the American Statistical Association* 75:295-305.
- . 1981. "Change and Stability in Educational Stratification." *American Sociological Review* 46:72-87.
- Müller, Walter, and Dietmar Haun. 1994. "Bildungsungleichheit im sozialen Wandel." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 46:1-42.

- Organisation for Economic Co-operation and Development. 2001. *Knowledge and Skills for Life - First Results from the OECD Programme for International Student Assessment (PISA) 2000*. Paris: OECD.
- . 2004. *Learning for Tomorrow's World – First Results from PISA 2003*. Paris: OECD.
- Prenzel, M., Jürgen Baumert, W. Blum, Rainer Lehmann, D. Leutner, Neubrand M., R. Pekrun, H.-G. Rolff, J. Rost, U. Schiefele, and [Pisa-Konsortium Deutschland] (Eds.). 2004. *PISA 2003. Der Bildungsstand der Jugendlichen in Deutschland – Ergebnisse des zweiten internationalen Vergleichs*. Münster: Waxmann.
- Rijken, Susanne. 1999. *Educational Expansion and Status Attainment. a Cross-National and Over-Time Comparison*. Amsterdam: Thela Thesis (ICS dissertation).
- Shavit, Yossi, and Hans-Peter Blossfeld (Eds.). 1993. *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Boulder (Colorado): Westview Press.
- Shavit, Yossi, and Karin Westerbeek. 1998. "Educational Stratification in Italy: Reforms, Expansion, and Equality of Opportunity." *European Sociological Review* 14:33-47.
- Vallet, Louis-André. 2004. "The Dynamics of Inequality of Educational Opportunity in France: Change in the Association Between Social Background and Education in Thirteen Five-Year Birth Cohorts (1908-1972)." Paper prepared for the meeting of the ISA Research Committee on Social Stratification and Mobility, May 6-8, 2004. Neuchâtel, Switzerland.
- Van de Werfhorst, Herman. 2001. *Field of Study and Social Inequality: Four Types of Educational Resources in the Process of Stratification in the Netherlands*. Nijmegen: ICS Dissertation.
- Whelan, Christopher T., and Richard Layte. 2002. "Late industrialisation and the increased merit selection hypothesis: Ireland as a test case." *European Sociological Review* 18:35-50.
- Xie, Yu. 1992. "The Log-Multiplicative Layer Effect Model for Comparing Mobility Tables." *American Sociological Review* 57:380-395.

Appendix Table 1:

CASMIN educational categories

1a	<i>Inadequately completed elementary education</i>
1b	<i>Completed (compulsory) elementary education</i>
1c	<i>(Compulsory) elementary education and basic vocational qualification</i>
2a	<i>Secondary, intermediate vocational qualification or intermediate general qualification and vocational training</i>
2b	<i>Secondary, intermediate general qualification</i>
2c_gen	<i>Full general maturity qualification</i>
2c_voc	<i>Full vocational maturity certificate or general maturity certificate and vocational qualification</i>
3a	<i>Lower tertiary education</i>
3b	<i>Higher tertiary education</i>

Appendix Table 2:

EGP Class Categories and Category Groupings used

I	<i>Higher-grade professionals, administrators, and officials; managers in large industrial establishments; large proprietors</i>
II	<i>Lower-grade professionals, administrators, and officials; higher-grade technicians; managers in small industrial establishments; supervisors of non-manual employees</i>
IIIa	<i>Routine non-manual employees, higher grade (administration and commerce)</i>
IVa	<i>Small proprietors, artisans, etc., with employees</i>
IVb	<i>Small proprietors, artisans, etc., without employees</i>
IVc	<i>Farmers and smallholders; other self-employed workers in primary production</i>
V	<i>Lower-grade technicians; supervisors of manual workers</i>
VI	<i>Skilled manual workers</i>
VIIa	<i>Semi- and unskilled manual workers (not in agriculture, etc.)</i>
VIIb	<i>Agricultural and other workers in primary production</i>
IIIb	<i>Routine non-manual employees, lower grade (sales and services)</i>

Table 1: Sources of data

Country	# tables	Sources of data	Years for which data are included
Germany	28	Zumabus	1976-77 1979(2) 1980 1982
		Allbus	1980 1982 1984 1986 1988 1990-92 1994 1996 1998 2000 2002
		Politik in der BRD	1978 1980
		Wohlfahrtssurvey	1978
		German Life History Study	I (1981-1983) II (1985-1988) III (1988-1989)
		German socio-economic panel	1986 1999 2000
France	4	Formation-qualification professionnelle Insee surveys	1970 1977 1985 1993
Italy	2	National survey on social mobility	1985
		Italian household longitudinal survey	1997
Ireland	3	Survey of the determinants of occupational status and mobility	1973
		Survey of income distribution and poverty	1987
		Living in Ireland survey	1994
Great Britain	15	General household survey	1973 1975-76 1979-1984 1987-1992
Sweden	24	Annual surveys of living conditions (ULF)	1976-1999
Poland	3	Zagorski 1976	1972
		Slomczyski 1989	1988
		Treiman/ Szelenyi	1994
Hungary	4	Social mobility and life history survey	1973 1983 1992
		Way of Life and Time Use Survey (Hungarian Central Statistical Office)	2000
Netherlands	35	Parliamentary Election Study	1970 1971 1977 1981 1982 1986 1994 1998
		Political Action Survey I	1974 1979
		Justice of Income Survey	1976
		CBS Life Situation Survey	1977 1986
		National Labour Market Survey	1982
		National Prestige and Mobility Survey	1982
		Strategic Labour Market Survey	1985 1988 1990 1992 1994 1996 1998
		Cultural Changes [ISSP]	1987
		Justice of Income Survey	1987
		Primary and Social Relationships	1987
		Social and Cultural Trends	1990
		Justice of Income Survey[ISJP]	1991
		Family Survey I, 1992-93	1992
		Households in the Netherlands pilot	1994
		Households in the Netherlands	1995
		Social Inequality in the Netherlands	1996
		National Crime Study	1996
		Social and Economic Attitudes	1998
		Netherlands Family Survey II	1998
		Use of Information Technology	1999

Table 2: Sample sizes for cohorts by country

Country	Cohort					Total
	1908-27	1928-37	1938-47	1948-57	1958-72	
Germany	3,999.0	3,914.0	4,718.0	4,255.0	2,117.0	19,003.0
France	14,296.4	11,816.6	8,584.7	5,919.8	1,369.2	41,986.8
Italy	299.0	963.0	1,209.0	1,229.0	835.0	4,535.0
Ireland	876.8	1,212.1	1,347.7	1,519.1	523.9	5,479.7
Great Britain	7,973.5	14,208.5	25,392.5	15,914.0	1,799.0	65,287.5
Sweden	8,271.3	7,536.7	10,769.1	7,307.7	3,132.7	37,017.4
Poland	11,783.0	9,730.0	4,612.0	1,190.0		27,315.0
Hungary	7,685.4	6,683.5	6,565.9	5,067.2	1,971.6	27,973.8
Netherlands	2,981.6	3,975.3	5,070.6	4,763.6	2,505.9	19,297.1
Total	58,166.2	60,039.6	68,269.7	47,165.5	14,254.3	247,895.5

Table 3 Models fitted to Origin-by-Education-by-Cohort-by-Survey tables

					Conditional tests						
					G ²	df	p	Δ	G ²	df	p
Germany											
1	COE CS SO SE	661.8	596	0.032	5.70%						
2	COE CSO SE	567.1	512	0.046	4.86%	1-2	94.6	84	0.201		
3	COE CSO CSE	495.9	456	0.096	4.46%	2-3	71.3	56	0.082		
4	COE CSO CSE SOE	333.4	336	0.529	3.52%	3-4	162.4	120	0.006		
France											
1	COE CS SO SE	267.8	242	0.122	2.14%						
2	COE CSO SE	229.5	212	0.195	1.79%	1-2	38.3	30	0.142		
3	COE CSO CSE	206.8	192	0.220	1.65%	2-3	22.7	20	0.304		
4	COE CSO CSE SOE	117.5	120	0.546	1.21%	3-4	89.3	72	0.082		
Italy											
1	COE CS SO SE	94.1	92	0.420	3.35%						
2	COE CSO SE	73.4	80	0.685	2.68%	1-2	20.7	12	0.055		
3	COE CSO CSE	63.7	72	0.746	2.45%	2-3	9.7	8	0.286		
4	COE CSO CSE SOE	38.0	48	0.848	1.77%	3-4	25.7	24	0.370		
Ireland (4 educ. categories)											
1	COE CS SO SE	142.2	117	0.056	4.22%						
2	COE CSO SE	120.3	99	0.072	3.88%	1-2	21.9	18	0.235		
3	COE CSO CSE	110.1	90	0.074	3.74%	2-3	10.2	9	0.335		
4	COE CSO CSE SOE	61.8	54	0.218	2.50%	3-4	48.3	36	0.082		
Britain (6 classes)											
1	COE CS SO SE	349.9	283	0.004	2.94%						
2	COE CSO SE	309.6	248	0.005	1.82%	1-2	40.4	35	0.244		
3	COE CSO CSE	256.1	220	0.048	1.60%	2-3	53.4	28	0.003		
4	COE CSO CSE SOE	139.6	140	0.493	1.10%	3-4	116.5	80	0.005		
Sweden											
1	COE CS SO SE	493.9	470	0.215	3.74%						
2	COE CSO SE	440.0	404	0.105	3.30%	1-2	53.9	66	0.857		
3	COE CSO CSE	324.6	360	0.910	2.83%	2-3	115.4	44	0.000		
4	COE CSO CSE SOE	210.3	264	0.994	2.17%	3-4	114.3	96	0.098		
Poland (4 cohorts, 6 classes)											
1	COE CS SO SE	140.21	127	0.200	1.01%						
2	COE CSO SE	124.14	112	0.204	0.83%	1-2	16.07	15	0.378		
3	COE CSO CSE	103.18	100	0.394	0.71%	2-3	20.96	12	0.051		
4	COE CSO CSE SOE	74.976	60	0.092	0.59%	3-4	28.21	40	0.919		
Hungary											
1	COE CS SO SE	420.0	310	0.000	3.25%						
2	COE CSO SE	343.9	268	0.001	2.65%	1-2	76.1	42	0.001		
3	COE CSO CSE	314.1	240	0.001	2.50%	2-3	29.7	28	0.375		
4	COE CSO CSE SOE	168.5	168	0.475	1.56%	3-4	145.6	72	0.000		
The Netherlands											
1	COE CS SO SE	586.5	494	0.003	5.99%						
2	COE CSO SE	513.3	428	0.003	5.49%	1-2	73.2	66	0.253		
3	COE CSO CSE	434.1	384	0.039	4.88%	2-3	79.2	44	0.001		
4	COE CSO CSE SOE	268.6	264	0.410	3.61%	3-4	165.5	120	0.004		

Table 4: Goodness-of-fit of model of constant (across surveys) origin–education association within birth cohorts (figures in bold indicate statistically significant at $p < .05$)

<i>Cohort</i>	<i>Germany</i>		<i>Britain</i>		<i>Netherlands</i>		<i>Hungary</i>	
	G^2	df	G^2	df	G^2	df	G^2	df
1908-27	94.3	72	16.64	20	89.4	72	85.57	48
1928-37	115.8	120	101.5	80	141.3	120	36.15	48
1938-47	116.3	120	93.6	80	94.3	96	90.93	72
1948-57	104.4	96	44.4	40	70.0	72	73.79	48
1958-72	65.1	48	*	*	63.6	48	27.69	24

* = cohort observed only once

Table 5 Modelling change over cohorts in the Origin-by-Education association

					Conditional tests		
					G ²	df	p
					G ²	df	p
Germany							
1	OE CSO CSE	657.4	552	0.001	5.33%		
2	β_c OE CSO CSE	601.0	548	0.058	5.02%	1-2	56.4 4 0.000
3	COE CSO CSE	495.9	456	0.096	4.46%	2-3	105.2 92 0.165
France							
1	OE CSO CSE	462.3	288	0.000	2.55%		
2	β_c OE CSO CSE	388.7	284	0.000	2.33%	1-2	73.6 4 0.000
3	COE CSO CSE	206.8	192	0.220	1.65%	2-3	181.8 92 0.000
Italy							
1	OE CSO CSE	191.6	168	0.102	5.12%		
2	β_c OE CSO CSE	182.1	164	0.158	4.89%	1-2	9.5 4 0.051
3	COE CSO CSE	63.7	72	0.746	2.45%	2-3	118.4 92 0.033
Ireland (4 educ. categories)							
1	OE CSO CSE	214.3	162	0.004	6.21%		
2	β_c OE CSO CSE	209.7	158	0.004	6.17%	1-2	4.6 4 0.331
3	COE CSO CSE	110.1	90	0.074	3.74%	2-3	99.6 68 0.008
Britain (6 classes)							
1	OE CSO CSE	436.9	300	0.000	2.34%		
2	β_c OE CSO CSE	412.6	296	0.000	2.23%	1-2	24.3 4 0.000
3	COE CSO CSE	256.1	220	0.048	1.60%	2-3	156.5 76 0.000
Sweden							
1	OE CSO CSE	587.5	456	0.000	3.84%		
2	β_c OE CSO CSE	494.9	452	0.080	3.44%	1-2	92.6 4 0.000
3	COE CSO CSE	324.6	360	0.910	2.83%	2-3	170.2 92 0.000
Poland (4 cohorts, 6 classes)							
1	OE CSO CSE	301.6	160	0.000	2.58%		
2	β_c OE CSO CSE	237.7	157	0.000	1.82%	1-2	63.9 3 0.000
3	COE CSO CSE	103.2	100	0.394	0.71%	2-3	134.5 57 0.000
The Netherlands							
1	OE CSO CSE	635.7	480	0.000	6.25%		
2	β_c OE CSO CSE	571.8	476	0.002	5.94%	1-2	63.9 4 0.000
3	COE CSO CSE	434.1	384	0.039	4.88%	2-3	137.7 92 0.001

Figure 1: Proportion of men with at least upper secondary education at their highest level of education by cohort and country

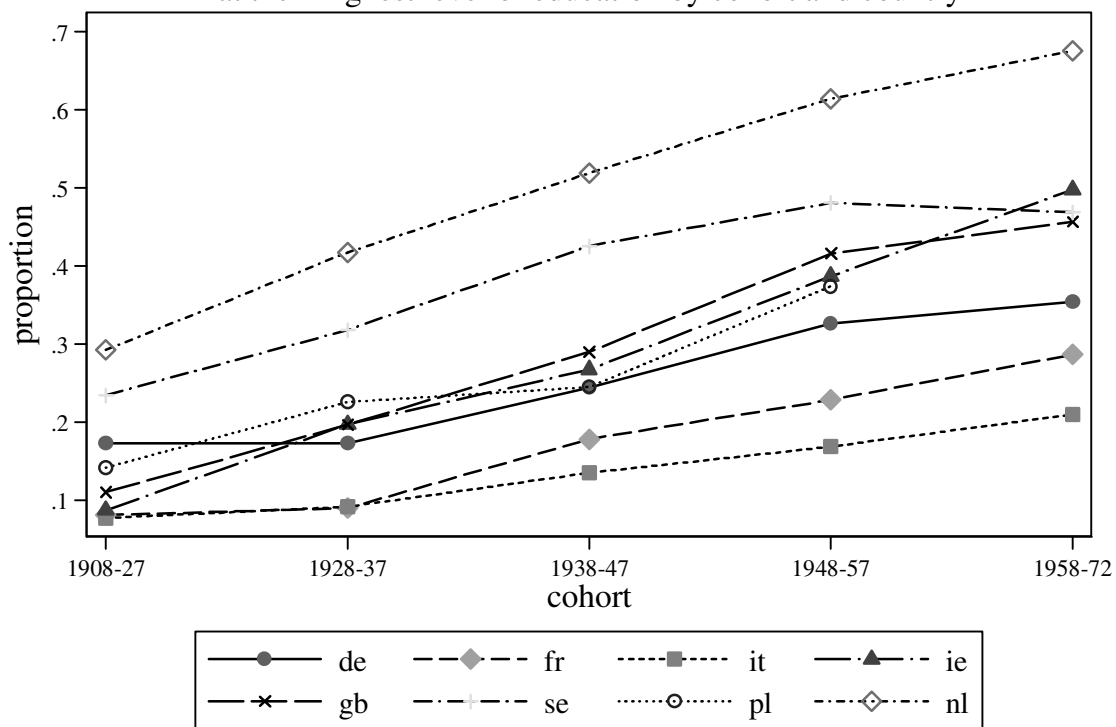


Figure 2: Proportion of men reaching tertiary education by cohort and country

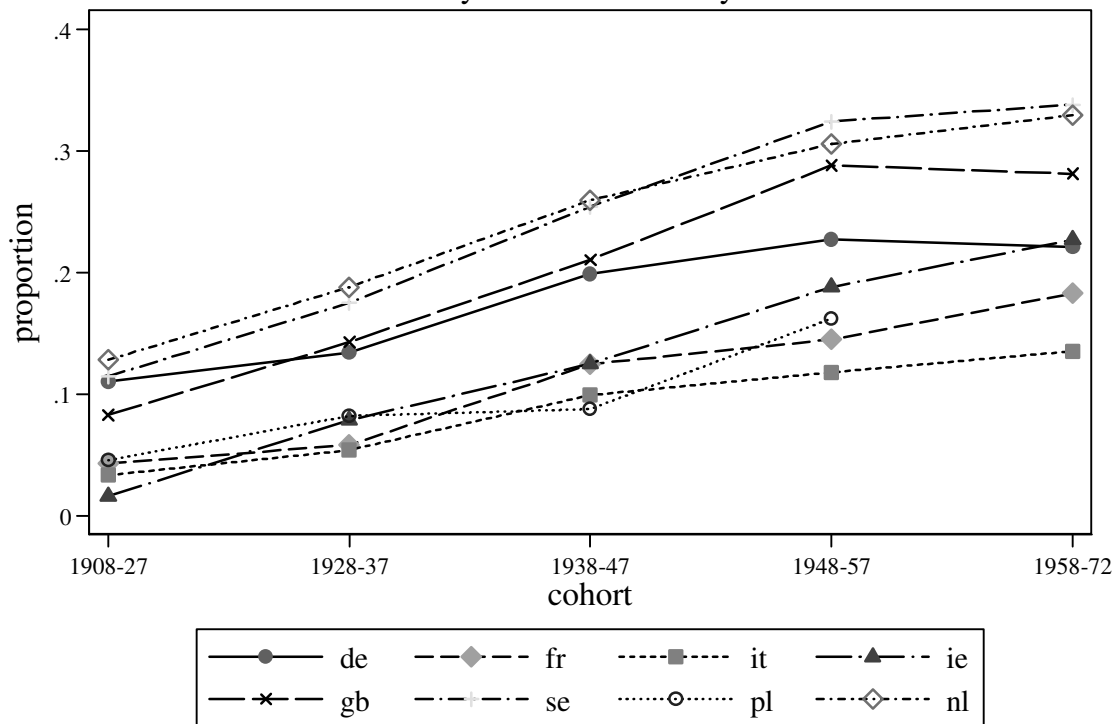


Figure 3 Proportions in various classes for first and last cohort by country (marginal distributions)

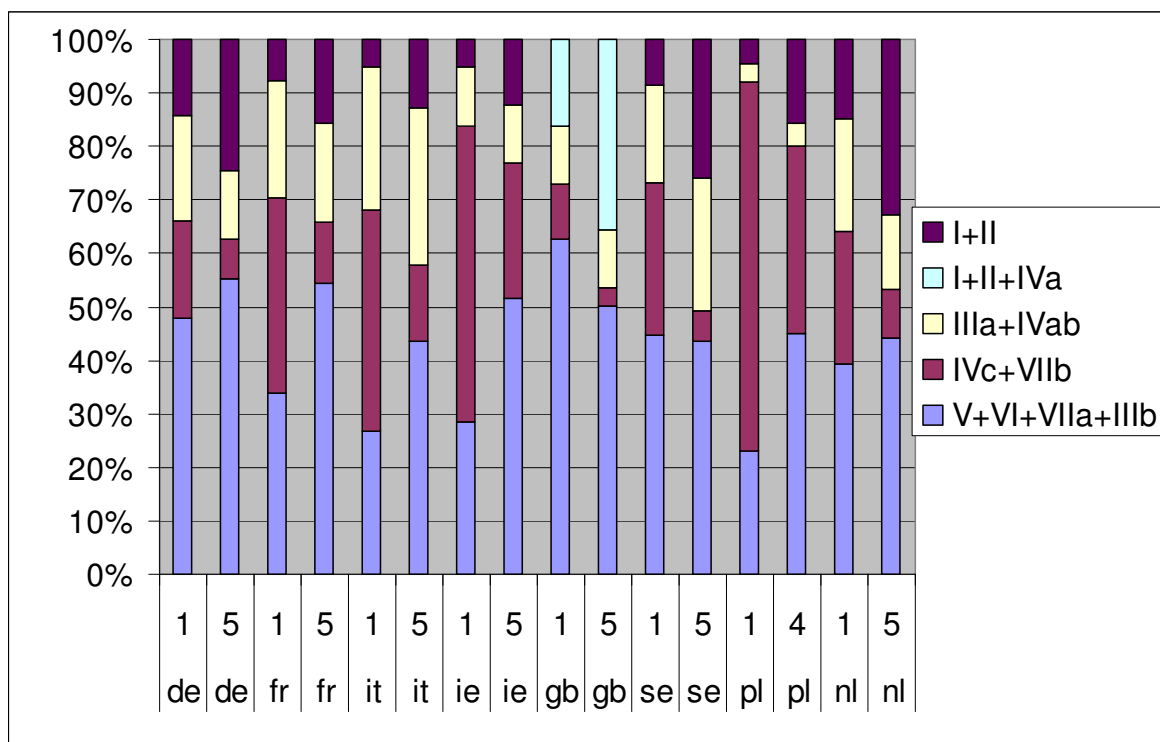


Figure 4: Log multiplicative evolution over cohorts of the Origin-by-Education association by country

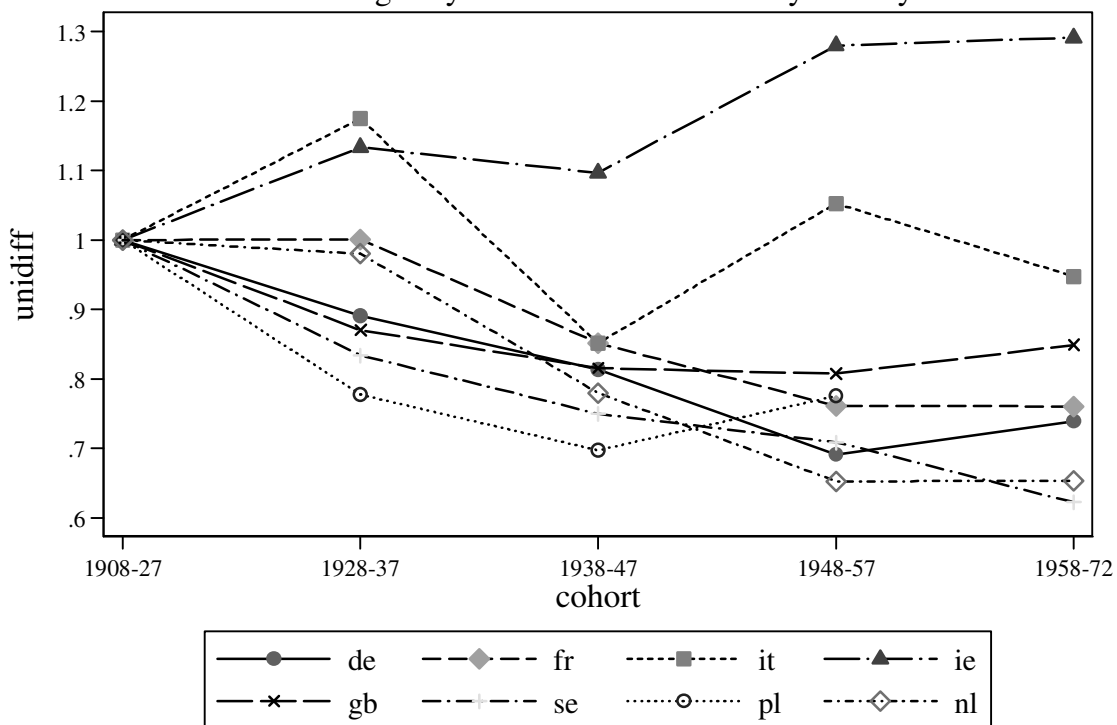
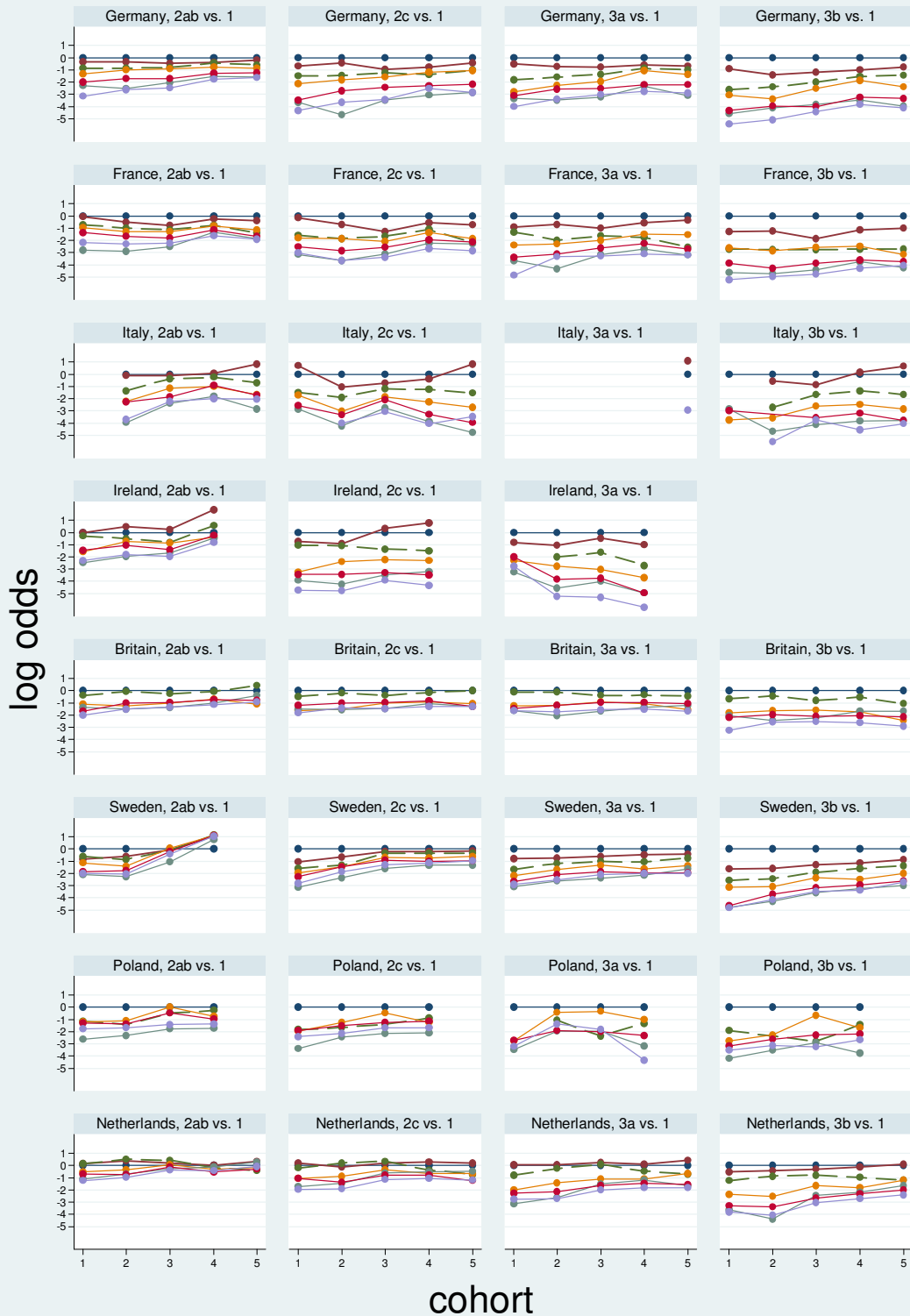
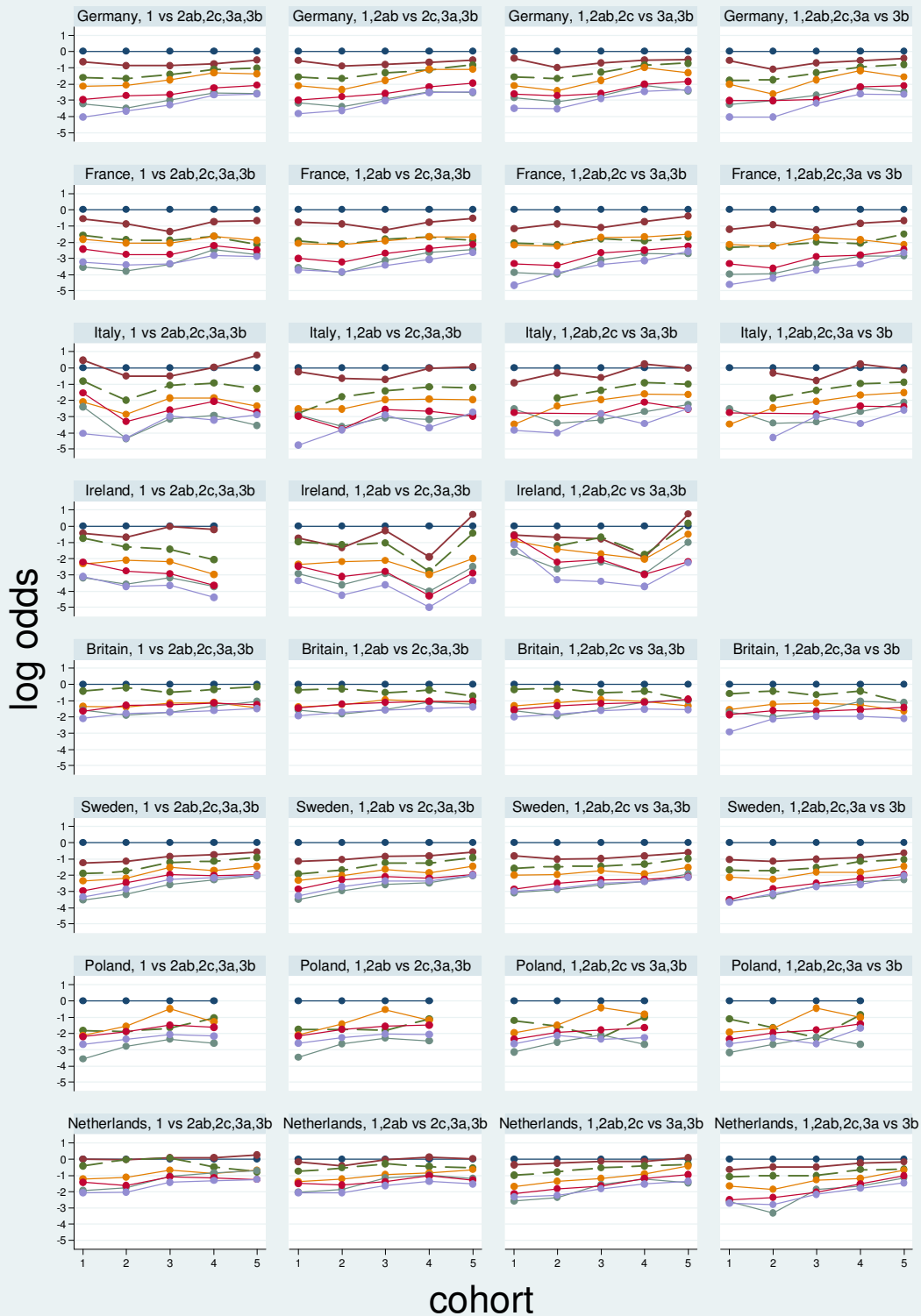


Figure 5: Log odds of educational achievement among classes: pairwise educational comparisons



Note: class I is class I+II in Poland and class I+II+IVa in Britain; educational level 3a is educational level 3ab in Ireland

Figure 6: Log odds of educational achievement among classes: cumulative comparisons



Note: class I is class I+II in Poland and class I+II+IVa in Britain; educational level 3a is educational level 3ab in Ireland

Figure 7: Log multiplicative evolution over cohorts of the Origin-by-Education association by country (comparative analysis for 6 classes and 4 educational categories)

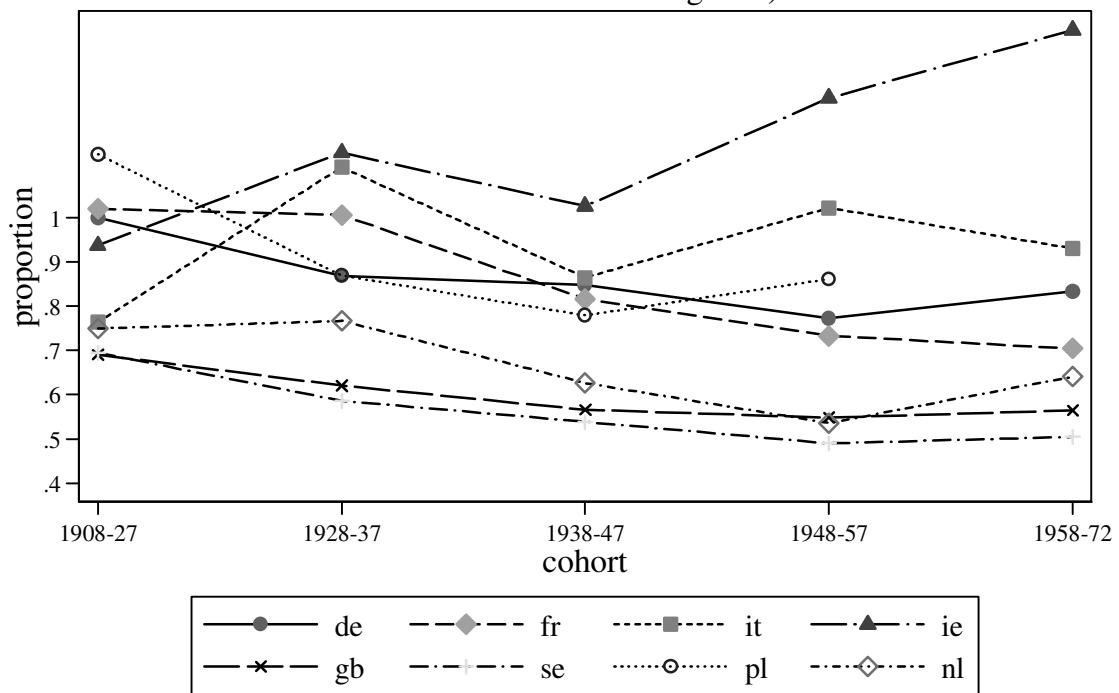


Figure 8. Log multiplicative evolution over cohorts of the Origin-by-Education association by country—100 samples drawn from the data used in this paper of the size of the samples analysed in Shavit and Blossfeld (1993)

