Persistent Inequality in Educational Attainment and its Institutional Context

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Research has repeatedly shown that educational opportunities are distributed unevenly in all countries. Therefore, the question is not *whether* family background and educational outcomes are related but to *what degree* they are related. This latter question then invites a comparative perspective. That is, does social inequality in education differ across time and countries? If yes, which institutional characteristics can explain differences in educational inequality? Educational inequality is conceptualized as the association between individuals' and their parents' highest educational level attained. Intergenerational educational mobility processes are analysed for 20 industrialized nations by means of log-linear and log-multiplicative models. The results show that the degree of educational mobility has remained stable across the second half of the 20th century in virtually all countries. However, nations differ widely in the extent to which parents' education influences their children's educational attainment. The degree of educational inequality is associated with the institutional structure of national education systems. Rigid systems with dead-end educational pathways appear to be a hindrance to the equalization of educational opportunities, especially if the sorting of students occurs early in the educational career. This association is not mediated by other institutional characteristics included in this analysis that do not exert notable influences on educational mobility.

Introduction

Educational Inequality in Comparative Perspective

The most basic and consistent finding in the stratification and education literature is the existence of strong social inequalities in educational outcomes. It is uncontroversial that individual ability is not the only determinant of children's educational success, but that instead a multitude of social background characteristics affect children's educational careers. Sociologists typically study the effects of parental education, class, or socio-economic status on children's educational achievement (e.g. grade point averages, standardized test results, etc.) or attainment (e.g. completion of high school, college, or post-graduate educational degrees). In whichever way the influence of parental characteristics on educational success is conceptualized, it shows to be a strong and significant one. Thus, the question is not whether parental characteristics influence students' educational success but to what degree they do. This latter question then invites a comparative perspective: do social inequalities in education differ across time? Does the association between social background and educational success differ across countries? And, if yes, which nations are most successful in reducing the influence of family background on educational attainment? This article addresses all of these questions.[1] It thus ties in with major sociological comparative projects

that compare educational attainment across a reasonably large number of countries (Treiman and Yip, 1989; Müller and Karle, 1993; Shavit and Blossfeld, 1993; Erikson and Jonsson, 1996a; Shavit *et al.*, 2007a).

The starting point for this project is best described by Breen and Jonsson who in their review of the current state of the field conclude that 'unambiguous conclusions about trends and ranking of countries have proven elusive. In addition, no strong evidence exists that explains intercountry differences'. (2005: 223). I address exactly these deficits, first through a comprehensive description and comparison of inequality in educational attainment across 20 nations and the construction of the demanded ranking of nations, and second by relating the national degree of educational inequality to the institutional set-up of the national education system. These efforts distinguish themselves from existing work in the following important ways:

First, I focus exclusively on the association between individuals' education and the education of their parents, while disregarding further parental characteristics like occupational status (available for some but not all countries in the data source used) or family income. Of course, the latter characteristics have been shown to exert an independent influence on individuals' educational attainment. As a matter of fact, an entire generation of stratification research, the status attainment research following Blau and Duncan's influential work (1967), has entertained this point. The approach taken here instead assesses the gross effect of parental education on their offspring's educational success. Similarly, researchers affiliated with the CASMIN project (Comparative Analysis of Mobility in Industrial Nations) have investigated the gross effects of parents' social class position on their offspring's educational attainment (Müller and Karle, 1993; Ishida *et al.*, 1995; some contributions to Erikson and Jonsson, 1996a; Breen *et al.*, 2005; Breen and Jonsson, 2007). However, when investigating gross effects of parental education, one could also interpret them as total or zero-order effects to the degree that other background characteristics like social class are temporally subsequent to and correlated with parental education. The common empirical finding that among all other social background characteristics, parental education normally also exerts the strongest direct effects on individuals' educational attainment should further underline the meaningfulness of this approach.

Second, I assess educational inequality at a more comprehensive level than most existing comparative studies do. Instead of focusing on one or several single educational transition steps, the comprehensive view on educational attainment suggested here will capture a broad picture that takes inequalities at all educational levels into account. Ultimately, it also produces a global measure of national educational inequality that can serve as a meaningful dependent variable in the explanatory part of this analysis. Such a broad look at educational inequality is accomplished by drawing on potent statistical methods for the cross-classification of parents' and their offspring's educational status.

Third, this article draws on the 'International Adult Literacy Survey' (IALS), a rich data set that pools data from 20 countries where identical surveys have been administered explicitly for comparative purposes. Despite its potential for comparative analyses, the IALS has so far been underused in stratification research. The opportunity to include a variety of countries that so far have been excluded from the kind of systematic comparative work cited above is one of the major advantages in using this data set.

Lastly, an integral part of this article moves beyond the description of educational inequality and tries to explain its cross-national variance. It aims for a systematic empirical assessment of the effects of institutional features of the national education system. In the past, such enterprise has been accomplished following the collaborative-comparative methodology exemplified in Shavit and Blossfeld's influential volume 'Persistent Inequality' (Shavit and Müller, 1998; Arum and Müller, 2004; Breen, 2004a; Shavit *et al.*, 2007a). Combining in-depth assessments of the idiosyncratic history and context of single nations with a disciplined statistical and generalizing analysis across these nations holds great potential for bridging the commonly noted tension between variable-oriented and case-oriented comparative approaches (for a good overview of the competing paradigms and their defenders see Brochmann *et al.*, 1997). While this article inescapably leans towards the variable-oriented approach in order to compare as many as 20 nations, it also capitalizes on some existing collaborative projects by drawing on the detailed narrative accounts supplied in single country chapters as well as the summarizing classifications provided by the respective editors. By virtue of addressing the question of how educational inequality is affected by institutional arrangements this project forms part of the most current 'fourth generation' of comparative stratification research (Treiman and Ganzeboom, 2000).

Theoretical Background

There exists an extensive range of theoretical explanations for the intergenerational association of

educational status. Here, I focus mainly on one mechanism that relates to the direct effects of parental education rather than its indirect effects through related social background characteristics. This provides the background for understanding the *causal* part of the intergenerational association in educational status. I then explicate how the proposed individual-level mechanism is contingent on the institutional structure of the education system. This lays out the terrain for the macro-sociological comparative part of this article.

The transmission of differential intellectual *ability* is frequently offered as a 'natural' (both in the sense of biological and ordinary) explanation for the similarity in educational outcomes between parents and their offspring. In its most radical form, this argument amounts to the claim that educational attainment is an accurate reflection of individual ability levels that are genetically transmitted from one generation to the next (Herrnstein and Murray, 1994). While this argument has been forcefully contested elsewhere (Fischer *et al.*, 1996), the cross-national analysis of educational inequality provided here also yields some counter-evidence to it. With genetic mechanisms operating in the same way in all countries, one would expect cross-national constancy in the intergenerational association of educational status if these were the only mechanisms at work. To the degree that significant variation across nations is found, it cannot be claimed that only individual ability differences would account for educational inequality.

A more rigorous and, therefore, more accepted approach is that provided by *rational choice theory*. The concept of rational educational choices is not new to the field (Boudon, 1974; Gambetta, 1987), but it has recently regained some momentum thanks to novel and more formal propositions (Erikson and Jonsson, 1996b; Breen and Goldthorpe, 1997; Esser, 1999). This theory argues that parents and their children make rational educational decisions based on the costs, utility, and success probability of educational alternatives. Social differentials can arise in any of these components, especially if we assume differential perceptions of each of them. The central utility maximization rule underlying these models is the assumption that parents seek to ensure status maintenance for their children. The jury is out on the empirical adequacy of the theory's behavioural assumptions—so far with mixed results (Becker, 2003; Breen and Yaish, 2006; Stocké, 2007). Although the rational choice approach focuses on *class* differentials in educational attainment, its basic supposition that parents choose educational careers for their children that allow them to attain at least the same social status is a convenient starting

point for the theoretical argument developed here. Parents are assumed to show a preference for their children to attain at least the same educational level as they did (see also Davies *et al.*, 2002). The point that shall be stressed here, however, is that parents and their children rely on a variety of resources to realize these preferences. While the rational choice framework focuses on economic resources necessary to meet direct educational costs and offset opportunity costs, I argue for the importance of a different type of resource, namely parents' own educational experience. Similarly, researchers who have entertained an empirical assessment of the rational choice framework have recognized the role of parental resources that are not directly included in the existing rational choice models. Becker considers parents' own experience of the educational system as an independent factor in the realization of parental choices and points out that 'depending on their resources and abilities, some parents are able to push through their educational choices' (2003: 11). Similarly, Stocké concludes that instead of economic resources other parental resources should be considered for the explanation of manifested educational decisions (2007: 516).

In which way, then, do parents' own educational experiences constitute a resource for their offspring's school success? The *content knowledge* that is associated with the successful completion of an educational degree could be considered as one such resource. Highly educated parents might be better equipped to assist their children in their learning process either through direct help, such as homework assistance, or through the provision of educative or education-relevant materials like encyclopaedias, quality newspapers, or simply books (Teachman, 1987).[2] Since out-of-school learning has been shown to be an important contributor to social inequality in education (Heyns, 1978; Entwisle *et al.*, 1997; Downey *et al.*, 2004), this is a reasonable pathway through which parents' education can impact their children's education. In addition to and assumingly more important than content knowledge, the educational history of parents also provides them with a particular degree of *strategic knowledge* about educational success *per se*. School systems leave many decisions that affect the odds of transferring to the next higher educational level to students and their parents, such as which courses to enroll in, whether to take qualifying examinations, or sometimes simply whether or what kind of education to enroll in at a given level (e.g. pre-school or vocational education). Parents' strategic knowledge of the determinants of success in school and the consequences of educational decisions for later educational

outcomes determines their ability to help their children successfully navigate through their educational careers (see also Lareau, 1989). There is compelling empirical evidence that parents do provide such guidance. A US study by Baker and Stevenson (1986), for example, documents how children's educational careers are actively managed by their parents. It is found that mothers who have completed post-secondary education are four times more likely than less-educated mothers to enroll their children in college-preparatory classes regardless of their child's prior achievement. In a qualitative study, Useem also depicts how highly educated parents rely on an 'expanded repertoire of intervention skills' (1992: 265) to place their children in high-status school tracks. The need for guidance through the educational maze is by no means restricted to early stages of schooling, but even pertains to higher education where 'social know-how requirements' are an essential condition for student success (Deil-Amen and Rosenbaum, 2003). Parents' strategic knowledge is a crucial information resource that might mediate part of the intergenerational association in educational status.

The institutional set-up of the education system is an integral part of the opportunity structure that individuals face when making educational decisions. The individual-level mechanism described earlier is thus dependent on the institutional context. That is, specific institutional characteristics can be hypothesized to play a crucial role in attenuating or intensifying the intergenerational association of educational status (Kerckhoff, 1995). This article focuses on one central institutional feature of the education system—namely the degree of stratification of educational opportunities—and proposes a link to the micro-level process of parental management. *Stratification* of the education system is generally understood as the degree to which educational opportunities are differentiated between and within educational levels (Hopper, 1968; Allmendinger, 1989). It accordingly captures the form of educational tracking or streaming and primarily refers to the timing and rigidity of student selection on the secondary level. Unlike other institutional characteristics of education systems, the stratification of the student selection process carries consequences on all levels of education. Hopper thus correctly asserted some 40 years ago that 'the structure of educational systems, especially those within industrial society, can be understood primarily in terms of the structure of their selection processes' (1968: 30). I argue that the degree of stratification determines the importance of parents' strategic knowledge of the education

system (see also Oswald *et al.*, 1988; Erikson and Jonsson, 1996b). In a highly stratified system, i.e. one with stable student selection into highly differentiated educational pathways, the guidance and management skills of parents are assumingly more consequential. The advantage of highly educated parents in guiding their children through the educational labyrinth should be notably larger in nations in which the educational labyrinth contains many furcations and pathways that inescapably lead to dead ends.

The theoretical argument outlined above is not meant to downplay, much less negate, the influence of ability, and rational choices on educational inequality, but assumes that parents' strategic knowledge of the education system is a crucial resource that translates into differential educational outcomes for their children. *The main argument* is that the strategic knowledge that parents derive from their own educational attainment and the value thereof critically depends on the degree of stratification of the education system. The analytical part of this article offers an empirical test of the hypothesis that the association of parents' and their children's educational status is higher in highly stratified systems.

Methods

Educational Mobility Defined

The study of educational attainment has typically been entertained in a regression framework, specifically since Mare (1981), in the form of logistic models of educational transitions. This model replaced the linear 'years of education' approach thanks to two central methodological advances. Unlike OLS regressions of years of education, it distinguishes temporal changes in the association between social background and school continuation probabilities from changes in the marginal distribution of schooling. As education has drastically expanded in virtually all nations throughout the 20th century, it is crucial to empirically account for these shifts when investigating social background effects. Second, the Mare model allows the assessment of background effects for each transition step separately. Doing so typically yields the finding of declining background effects across transitions (Mare, 1981; Shavit and Blossfeld, 1993). The Mare model is still a widely used tool for studying inequality in educational attainment and continues to be refined and modified (Breen and Jonsson, 2000; Hauser and Andrew, 2006). Recently, it has, however, also been subjected to major methodological critique that has prompted some researchers to abandon it in favour of

other types of regression models.[3] Yet, another approach—notably used in the CASMIN research listed earlier—is that of mobility tables. As Erikson and Goldthorpe succinctly summarize, this approach allows us to express 'hypotheses on relative [mobility] rates—for example, concerning temporal stability or cross-national similarity—in a form in which they both have precise meaning and are readily available for empirical test' (1992: 54). This article builds on these central advantages by applying log-linear and log-multiplicative models to cross-tabulations of respondents' and their parents' highest attained educational status.[4] It thus, re-conceptualizes social inequality in education as processes of intergenerational mobility in educational attainment. High educational mobility corresponds to a low association between the educational status of parents and their offspring and accordingly to a low level of educational inequality. To my knowledge, the literature counts only two examples where this approach has been used to study educational mobility as such (Mare, 1997; Vallet, 2004) rather than the association between class origin and educational destination. This approach offers the following methodological benefits.

Log-linear models control for changes in the marginal distribution of schooling, or what in mobility analyses is often called the separation of *relative* mobility from *structural* mobility (Hout, 1983). This method thus also successfully accounts for the radical changes in the aggregate educational distribution across generations. Second, the focus on the final highest educational degree circumvents a problematic assumption of a the Mare model: by modelling the odds of transfer dependent on the completion of the preceding educational level, the Mare model presupposes a nested structure of educational transitions, i.e. one educational level must be successfully completed before the transition to the next level can occur. Reality can be much more complicated: some open education systems allow transfers to the next education level without completion of the preceding level. For instance, England and Wales have traditionally provided ample opportunities to enter post-secondary education for persons who have not completed secondary school but acquired qualifications while working (Kerckhoff and Trott, 1993). Third, the log-linear approach allows a comprehensive assessment of educational inequality in that it does not necessarily look at associations at selected levels of education (though this can be done through topological modelling, see Hauser, 1978), but is able to produce global measures of association across all categories of parental and offspring status. Researchers who try to construct such aggregate measures of social inequality from transition models normally compare the transition probability of a disadvantaged group of students to those of the most advantaged group for a selected educational level. This is of course only a partial picture of the associations between parental status and educational outcomes.

In sum, like the logistic transition model, the proposed approach successfully controls for cross-temporal changes in the marginal distribution of education. Unlike the logistic transition model, it does not distinguish between the different influences of a variety of social background factors at each transition step but instead aims at assessing the overall, aggregate structure of status transmission in education. We are able to take a look at the 'bigger picture' that so far may have been concealed by the focus on single educational transitions, and also to develop a global measure that adequately reflects this bigger picture and relate it to the institutional structure of the national education systems studied.

Data and Measurement

This article draws on data from the 'International Adult Literacy Survey' (IALS), a cooperative project of the Organization for Economic Cooperation and Development (OECD), and guided by Statistics Canada, in which research teams in 20 nations assessed adult literacy and its relationship to a number of social background and demographic characteristics. Each country that participated in this study applied a common set of survey questions to a large, nationally representative sample (ranging in size between 1,500 and 6,000) of its adult population (in most countries aged 16–65). Generally, high data quality across all IALS countries has been ensured by common data collection and processing guidelines. The data collection took place between 1994 and 1998 with countries participating in different collection cycles: in 1994 Canada (English and French-speaking populations), Germany, Ireland, The Netherlands, Poland, Sweden, Switzerland (German and French-speaking populations), and the US; in 1996 Australia, Belgium (Flemish community), Great Britain, Northern Ireland, and New Zealand; and finally in 1998 Chile, The Czech Republic, Denmark, Finland, Hungary, Italy, Norway, Slovenia, and the Italian-speaking part of Switzerland. For further details on the data from these countries the reader is referred to Appendix 1.

The analyses presented here include individuals with complete information on their own and their parents' educational attainment. They are also restricted to respondents aged 26–65 at the time of the interview.

Table 1 The ISCED educational classification

ISCED 0	Education preceding the first level.
ISCED 1	Education at the first level.
ISCED 2	Education at the second level, first stage.
ISCED 3	Education at the second level, second stage.
ISCED 5	Education at the third level, first stage, of the type that leads to an award not equivalent to a first university degree.
ISCED 6	Education at the third level, first stage, of the type that leads to a first university degree or equivalent.
ISCED 7	Education at the third level, second stage, of the type that leads to a post-graduate university degree or equivalent.

The upper boundary is predetermined in most IALS countries and it is additionally imposed for some countries who have also interviewed older respondents in order to circumvent selection problems produced by differential mortality. The lower boundary ensures that individuals have attained their highest level of education.[5] Lastly, immigrants who have acquired their highest educational degree before immigration are excluded.

Comparative education research needs to rely on broad typologies of educational levels that meet the challenge of combining a diverse and nationally specific array of educational degrees into meaningful and cross-nationally equivalent educational categories. A widely used educational typology for this purpose is the 'International Standard Classification of Education' (ISCED). This scheme identifies three broad educational levels (Table 1): primary, secondary, and tertiary and within the latter two further distinguishes various stages.

The lower secondary level most often ends after grade 8 or 9 and coincides with the end of compulsory education in many nations. Only after its completion can students progress to the upper secondary level whose completion in turn is often required to access tertiary education. Tertiary level education that does not lead to a university degree normally lasts at least 2 years and can either precede university education or be an alternative to it (which would produce problems for a sequential transition model of educational attainment). For this analysis, I merge ISCED categories 6 and 7 into one category of 'university education' as well as categories 0 and 1 into 'education preceding the secondary level'. This decision is dictated by the structure of the Canadian data (where the categories are already collapsed in this way), but would also have been necessary due to cell scarcity in the cross-classifications of educational levels.

The inherent problem of any internationally standardized measure of educational levels is that of sufficient comparability. The lack thereof is often lamented but only rarely assessed empirically. Evaluations of the relative merits of the ISCED and the CASMIN scale for a restricted number of countries yield some evidence that the CASMIN classification more adequately captures educational degrees for some European nations but that it is inferior to the ISCED scheme for the US (Braun and Müller, 1997; Kerckhoff and Dylan, 1999; Kerckhoff et al., 2002). Evidence for a larger number of countries is lacking so far. While the general question of the cross-national validity of the ISCED classification cannot be resolved here (for ongoing efforts to do so see Schneider, 2007), it is important to draw the reader's attention to one central weakness of the classification system used here. Educational inequality can manifest itself not only in regards to the level but also—as is the case in many European nations—in the *kind* of education, specifically academically versus vocationally oriented education. The original ISCED scheme provided in the IALS fails to take this form of horizontal differentiation into account. Whether the consideration of horizontal differences in education alters the presented results is a question of substantive interest as it has been argued that privileged groups rely upon horizontally differentiated educational degrees to ensure the perpetuation of their relative advantage in face of the massive growth in educational participation (Lucas, 2001). A replication and validation of this study that draws on the latest versions of the ISCED and the CASMIN scale—which have been developed in direct response to the noted shortcoming of the earlier ISCED scale—is encouraged, therefore. Since this article focuses exclusively on the vertical dimension of the education status hierarchy, one concern might be that by collapsing national educational credentials with meaningful differences into one international category, this analysis could hide an important part of the mobility that occurs within those too broadly defined categories. The degree of educational mobility would thus be underestimated in countries with a highly differentiated education system. To address this concern, stability analyses were carried out on a subset of

countries for which some information about the vocational and academic nature of education is available. These analyses do not yield any evidence of systematic bias arising from the exclusive focus on the vertical dimension of the educational hierarchy.[6]

Results

Stability of Educational Mobility Across Time

Shavit and Blossfeld's influential book *Persistent Inequality* (1993) concludes, as the title suggests, that the association between family background and educational attainment has remained stable over the 20th century for all countries included in their analysis except for Sweden and the Netherlands. Shavit *et al.*' s comparative volume (2007a) generally mirrors this finding for the case of post-secondary education. The finding of persistent inequality has also been contested and a decreasing effect of social class background on educational attainment has recently been reported for several countries (Breen *et al.*, 2005). It should be noted, however, that this is only at first sight a genuine controversy. While Shavit and Blossfeld investigate inequalities in transition rates by parental education *and* parental occupational status, Breen *et al.* assess educational inequality in regard to one background characteristic only: social class. By studying social class differences in education, their findings cannot be taken to support the idea that educational opportunities have been equalized in a broad sense. Shavit and Blossfeld correctly argue that we should interpret inequality of educational opportunity to be declining only where *both* parental occupation and parental education show declining effects. As long as Breen *et al.*'s findings are not complemented by a documentation of declining effects of parental education, we shall refrain from claiming an equalization of educational opportunities in the broad meaning of the term (see also Shavit *et al.*, 2007b).

A comparison of educational mobility across age groups addresses this latter point. The analyses presented here and in the following sections rely on the cross-classification of respondents' and their parents' educational level.[7] For the assessment of time trends in educational mobility, cross-tabulations of parental education (commonly called 'origin' in mobility tables), and respondents' education ('destination') are constructed for four age cohorts: respondents aged 26–35, 36–45, 46–55, and 56–65 at the time of the interview. Since IALS countries assembled their data in different

years (1994–1998), these age cohorts do not exactly correspond to the same birth cohorts in all countries. The log-linear analyses of these tables test whether educational mobility has changed over cohorts or not.[8] Specifically, I test whether a model that assumes the origin-destination association to be constant across all age groups ('Constant Association', *ConstAssoc*) yields a satisfactory fit in each nation. This model can be written in multiplicative terms to predict the cell frequencies of the mobility table,

$$F_{ijk} = \tau \cdot \tau_i^O \cdot \tau_j^D \cdot \tau_k^C \cdot \tau_{ik}^{OC} \cdot \tau_{jk}^{DC} \cdot \boldsymbol{\tau_{ij}^{OD}}$$
$$[\text{short form}: F = \text{OC}, \text{DC}, \text{OD}] \quad (1)$$

with τ as the grand-mean, τ_i^O, τ_j^D, and τ_k^C, respectively, as marginal effects of parental education (O), respondent's education (D), and cohort (C), τ_{ik}^{OC} and τ_{jk}^{DC} as interactions between education status and cohort (this part of the model controls for the change in the educational distribution over time), and finally τ_{ij}^{OD} as the cohort-constant association between parents' and respondents' education.

I then compare this model to one that allows the origin-destination association to vary over age groups by a multiplicative scaling factor (Φ); this is the 'Uniform Difference' (*UniDiff*) or 'log-multiplicative layer effects' model proposed by Erikson and Goldthorpe (1992) and Xie (1992) and written as

$$F_{ijk} = \tau \cdot \tau_i^O \cdot \tau_j^D \cdot \tau_k^C \cdot \tau_{ik}^{OC} \cdot \tau_{jk}^{DC} \cdot \exp\left(\Psi_{ij}^{OD} \boldsymbol{\Phi_k^C}\right)$$
$$[F = \text{OC}, \text{DC}, \text{OD}\Phi^C] \quad (2)$$

with Ψ_{ij}^{OD} as the pattern of intergenerational association in education and Φ_k^C as the cohort-specific strength of this association. Table 2 reports the results for these two models and the baseline model of 'Conditional Independence' (*CondIndep*) that assumes the independence of origin and destination while allowing the margins to vary across age groups:

$$F_{ijk} = \tau \cdot \tau_i^O \cdot \tau_j^D \cdot \tau_k^C \cdot \tau_{ik}^{OC} \cdot \tau_{jk}^{DC}$$
$$[F = \text{OC}, \text{DC}] \quad (3)$$

In all countries, the preferred model (highlighted in bold) is the 'Constant Association' model. Judging by the BIC criterion, ConstAssoc is clearly preferable over the UniDiff model which reflects the fact that the likelihood ratio (L^2) of the latter is only moderately lower than the likelihood ratio of the ConstAssoc model. In all cases, the UniDiff model also fails to reduce the number of misclassified cases (Δ) by a considerable portion. The preferred model, ConstAssoc, yields a satisfactory fit: it misclassifies on average 4.2 per cent of the cases (Δ)

Table 2 Educational mobility across cohorts

Model	L^2	df	P	Δ	BIC	$L_2^2 - L_3^2$
Belgium ($N=1,375$)						
(1) CondIndep	448.5	64	0.000	20.8	−14	
(2) ConstAssoc	69.8	48	0.022	6.3	−277	
(3) UniDiff	66.7	45	0.020	6.3	−259	0.373
Canada ($N=1,789$)						
(1) CondIndep	366.7	64	0.000	15.8	−113	
(2) ConstAssoc	43.2	48	0.670	4.6	−316	
(3) UniDiff	40.9	45	0.648	4.5	−296	0.507
Chile ($N=2,420$)						
(1) CondIndep	663.5	64	0.000	18.2	165	
(2) ConstAssoc	50.5	48	0.375	3.6	−323	
(3) UniDiff	49.8	45	0.289	3.6	−301	0.881
Czech Republic ($N=2,488$)						
(1) CondIndep	483.7	64	0.000	15.5	−17	
(2) ConstAssoc	51.9	48	0.324	4.4	−323	
(3) UniDiff	39.6	45	0.698	3.5	−312	0.006
Denmark ($N=2,374$)						
(1) CondIndep	340.3	64	0.000	12.6	−157	
(2) ConstAssoc	74.1	48	0.009	5.2	−299	
(3) UniDiff	68.1	45	0.015	4.8	−282	0.111
Finland ($N=2,256$)						
(1) CondIndep	246.4	64	0.000	10.0	−248	
(2) ConstAssoc	51.5	48	0.339	4.1	−319	
(3) UniDiff	37.8	45	0.767	3.5	−310	0.003
Germany ($N=1,029$)						
(1) CondIndep	296.0	64	0.000	16.5	−148	
(2) ConstAssoc	40.1	48	0.785	3.9	−293	
(3) UniDiff	34.8	45	0.865	3.5	−277	0.151
Great Britain ($N=2,212$)						
(1) CondIndep	275.2	64	0.000	10.9	−218	
(2) ConstAssoc	57.3	48	0.167	3.7	−312	
(3) UniDiff	56.1	45	0.124	3.6	−290	0.750
Hungary ($N=1,934$)						
(1) CondIndep	406.2	64	0.000	14.1	−78	
(2) ConstAssoc	42.5	48	0.697	4.0	−321	
(3) UniDiff	30.8	45	0.948	2.7	−310	0.008
Ireland ($N=1,590$)						
(1) CondIndep	440.1	64	0.000	19.5	−32	
(2) ConstAssoc	37.7	48	0.858	3.1	−316	
(3) UniDiff	36.3	45	0.819	2.9	−295	0.714
Italy ($N=2,382$)						
(1) CondIndep	661.3	64	0.000	17.9	164	
(2) ConstAssoc	58.3	48	0.147	3.2	−315	
(3) UniDiff	54.7	45	0.151	3.3	−295	0.316
Netherlands ($N=2,261$)						
(1) CondIndep	463.4	36	0.000	16.0	185	
(2) ConstAssoc	33.2	27	0.190	3.3	−175	
(3) UniDiff	31.8	24	0.132	3.5	−154	0.698

(continued)

Table 2 Continued

Model	L^2	df	P	Δ	BIC	$L_2^2 - L_3^2$
New Zealand ($N = 2,062$)						
(1) CondIndep	280.6	64	0.000	14.2	−208	
(2) ConstAssoc	42.1	48	0.711	4.2	−324	
(3) UniDiff	40.3	45	0.671	3.9	−303	0.607
Northern Ireland ($N = 2,043$)						
(1) CondIndep	238.0	64	0.000	9.3	−250	
(2) ConstAssoc	49.7	48	0.407	4.0	−316	
(3) UniDiff	38.3	45	0.750	3.1	−305	0.010
Norway ($N = 2,384$)						
(1) CondIndep	418.3	64	0.000	15.8	−79	
(2) ConstAssoc	51.6	48	0.335	3.8	−322	
(3) UniDiff	42.0	45	0.598	3.2	−308	0.023
Poland ($N = 2,254$)						
(1) CondIndep	472.3	64	0.000	15.7	−22	
(2) ConstAssoc	58.3	48	0.146	4.5	−312	
(3) UniDiff	55.9	45	0.128	4.4	−292	0.490
Slovenia ($N = 2,024$)						
(1) CondIndep	581.3	64	0.000	18.3	94	
(2) ConstAssoc	50.7	48	0.366	4.3	−315	
(3) UniDiff	49.7	45	0.293	4.3	−293	0.778
Sweden ($N = 1,822$)						
(1) CondIndep	326	64	0.000	13.8	−155	
(2) ConstAssoc	35.2	48	0.915	3.5	−325	
(3) UniDiff	31.6	45	0.935	3.1	−306	0.304
Switzerland ($N = 946$)						
(1) CondIndep	167.2	64	0.000	10.9	−271	
(2) ConstAssoc	45.3	48	0.585	4.6	−284	
(3) UniDiff	45.0	45	0.473	4.5	−263	0.955
United States ($N = 1,851$)						
(1) CondIndep	445.1	64	0.000	18.1	−36	
(2) ConstAssoc	42.7	48	0.688	4.7	−318	
(3) UniDiff	40.9	45	0.644	4.7	−298	0.621

Models: CondIndep, OC, DC; ConstAssoc, OC, DC, OD; UniDiff, OC, DC, ODΦ_C with O, origin; D, destination; C, age cohort (26–35, 36–45, 46–55, 56–65 in year of interview).

and is highly 'significant' in nearly all countries (with the exception of Belgium and Denmark). In five countries (Czech Republic, Finland, Hungary, Northern Ireland, and Norway), UniDiff does yield a significant improvement in model fit ($L_2^2 - L_3^2$) but this improvement is judged insufficient compared with the loss of model parsimony as indicated by BIC (Raftery, 1986 in addition cautions us that the commonly used significance levels are inadequate in log-linear analyses of this kind). Despite the fact that these results lead us to argue for constancy in educational mobility rates it might still be interesting to look at the log-multiplicative scaling parameters (Φ) estimated under the UniDiff model for each age group (Figure 1). With the oldest age group

serving as the reference, the parameters indicate a lower origin-destination association, i.e. higher mobility rates, if $\Phi < 1$, and conversely lower mobility rates if $\Phi > 1$ for the remaining age groups. The general picture reconfirms that 'Constant Association' can be taken as an accurate description of the trends in most countries: the parameters show some 'trendless fluctuation' around one, i.e. mobility remains largely unchanged across age groups. Figure 1A suggests that in some nations one single cohort shows an irregular degree of educational mobility as compared with the remaining cohorts (the oldest cohort in Denmark, the second oldest in Sweden, and the second youngest in Germany). Figure 1B singles out those nations where the UniDiff model provides a statistical improvement in fit

although—just as a reminder—it still cannot be chosen over the Common Association model.

A decreasing association could at best be noted for Norway and Finland, but only for the youngest cohort. Northern Ireland shows an irregular pattern with a decrease from the oldest to the second oldest cohort followed by an increase. The Czech Republic and Hungary, on the other hand, show some indication of an increasing association for the youngest two cohorts. While the increase for the youngest cohort

Figure 1 (**A**) UniDiff parameters across age groups (no significant model improvement by UniDiff). (**B**) UniDiff parameters across age groups (significant model improvement by UniDiff)

coincides with the transition from socialism to capitalism (the cohort members were aged 8–17 in 1990) the next older cohort already shows a similar level of educational mobility in Hungary and a similar trend towards an increasing association in the Czech Republic. It would thus be unwarranted to claim that the economic transition accounts for these changes—which, to start with, are empirically questionable.

In conclusion, the degree of association between parental education and individual educational attainment has remained constant over time in most countries. An uncertain trend towards less educational mobility could at best be observed for the Czech Republic and Hungary; a tendency for an increase in educational mobility for Norway and Finland. An adequate description for the overall trends in educational mobility is nevertheless that of 'persistent inequality' and the claim of a significant equalization of educational opportunities over the last century is unwarranted.

Cross-national Variation in Educational Mobility

A comparison of educational mobility across nations relies again on the following three models. As a baseline, 'Conditional Independence' suggests that the distribution of educational levels in the respondent and parent generation differs by country (ON, DN) but that there is no intergenerational association in education. The 'Common Association' model allows for this association (OD) but assumes that it is the same across countries. Finally, the 'UniDiff' model assumes that the pattern of this association is constant across nations but that its *strength*, i.e. the *degree of educational mobility*, differs across nations. The Netherlands unfortunately must be excluded from this analysis because of coding irregularities (cf. Appendix 1). The results presented in Table 3 show that UniDiff is the clearly preferred model judging by BIC and the dissimilarity index. It reduces the log-likelihood of the independence model by 92.8 per cent (denoted by rL^2) or, in other words, explains 92.8 per cent of the association between origin and destination. The drop in the likelihood ratio statistic
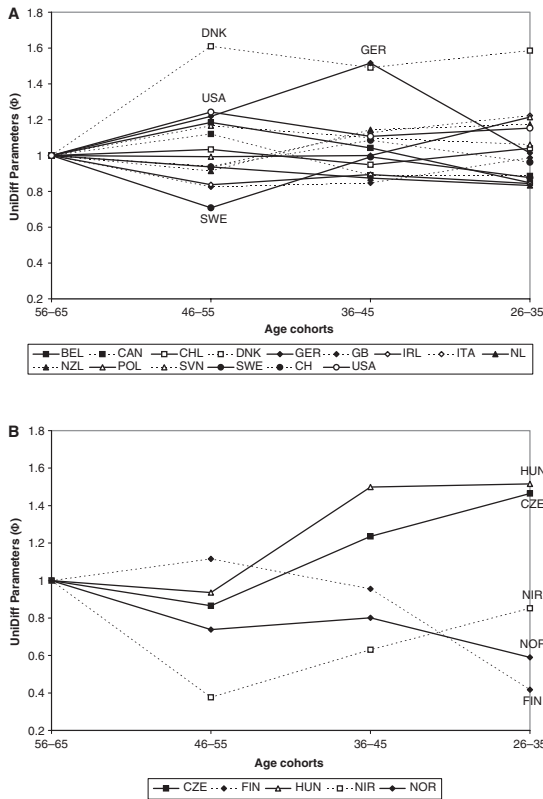
Table 3 Cross-national comparison of educational mobility

Model ($N = 38,189$)	L^2	df	P	rL^2	Δ	BIC	$P(L_2 - L_3)$
(1) CondIndep	7804.2	304	0.000		16.0	4597	
(2) CommAssoc	788.3	288	0.000	90.0	4.4	−2250	
(**3**) **UniDiff**	561.4	270	0.000	92.8	3.5	−2287	.000

Models: CondIndep, ON, DN; CommAssoc, ON, DN, OD; UniDiff, ON, DN, ODΦ_N with N, nation; rL^2, percentage reduction in L^2 compared with baseline (independence).

from 788 in the CommAssoc model to 561 in the UniDiff model is highly significant and 'worth' the loss of 18 degrees of freedom. It should not be seen as troubling that UniDiff does not yield a satisfactory overall fit when judging by model significance (P) because of the exceedingly large sample size of 38,189. With a sample this large, we can expect all models to predict cell frequencies that significantly diverge from the observed ones.[9] We, therefore, can conclude that nations differ significantly in their degree of educational mobility.

Breen and Jonsson state that 'there is only scattered knowledge about how different contemporary countries 'rank' in terms of inequality of educational attainment' (2005: 227). Certainly, any ranking of nations along one single dimension of educational inequality is a strong simplification of what in reality are complex social processes. Yet, the preceding analyses give some support to the claim that such an undertaking is feasible: with educational mobility being stable across time and—as additional analyses not shown here suggest (cf. footnote 1)—very similar for both sexes, a national ranking along the degree of educational mobility is probably as meaningful as one could wish for. A convenient way to rank order the included nations in this regard is again to report the estimated Φ parameters of

Table 4 International ranking of educational mobility

Country	Φ^*
Finland	0.24
Northern Ireland	0.22
New Zealand	0.19
Denmark	0.16
Great Britain	0.14
United States	0.14
Canada	0.13
Czech Republic	0.11
Sweden	0.10
Poland	0.08
Chile	−0.03
Ireland	−0.04
Italy	−0.14
Norway	−0.15
Hungary	−0.15
Switzerland	−0.17
Belgium	−0.20
Germany	−0.27
Slovenia	−0.34

*UniDiff parameters: mean-centered (i.e. average across countries = 0) and multiplied by (−1).
Note: The Swiss data apply to the Swiss–German population only. If included, the Swiss–Italian educational mobility rates would be about average and the Swiss–French rates in between the two.

the UniDiff model (Table 4). For easier interpretation these parameters are now mean-centred—so that the average degree of educational mobility across all nations equals to zero—and multiplied by −1—so that a positive number indicates higher than average mobility rates.

Table 4 shows that educational mobility rates vary widely across nations. To give a better sense of the absolute range of the degree to which parental education affects individuals' educational attainment, we can take a closer look at the extreme cases of the ranking: Even in Finland—the most 'open' society in regards to educational mobility—the average odds of attaining the same educational level as one's parents (when controlling for shifts in the marginal distribution) are about 3:1. In Slovenia, they are more than twice as large, i.e. around 7:1 (one arrives at these figures by averaging the main diagonal log-odds predicted under the saturated model; calculations not presented). The apparent cross-national variation in educational mobility builds the basis for the following section. There, I attempt a macro-sociological explanation of national educational mobility rates. Comments on the rank of specific nations shall, therefore, be withheld at this point.[10]

Educational Mobility and its Relationship to the Stratification of the Education System

The macro–micro link between parental management and guidance and the stratification of the education system has been spelled out theoretically earlier. Its empirical assessment requires a practical taxonomy of national education systems according to their degree of stratification. As Allmendinger notes, 'cross-national differences in the selection procedure are most remarkable in regard to the timing of the selection, the finality of the selection [rigidity], and the consequences of the selection' (1989: 50). In line with Müller and Shavit (1998), I hold systems to be *weakly stratified* where most students attend either untracked or tracked comprehensive schools, where between-track mobility is existent even if not necessarily to a great degree, and where access to post-secondary education is not formally predetermined by the choice of one track. *Highly stratified systems*, in contrast, usually divide students into separate schools of which only one or some types prepare for post-secondary education and others are 'dead-end' pathways that preclude the attainment of higher levels of education, mobility between these schools is very limited. *Very highly stratified systems* follow the same pattern as highly stratified systems, but select students for different types of secondary institutions at a

comparatively early grade level (typically grades 4–5), and these selection decisions are basically irrevocable as mobility between school types is minimal. If, as suggested earlier, parents' educational status is related to their ability to decide about or have influence on their children's placement into different tracks or schools, we would expect that the effects of parental education are high in highly stratified education systems where educational choices are particularly consequential. In very highly stratified systems, this effect will be even stronger because parental guidance is especially crucial at earlier ages and becomes essentially irreversible due to the static nature of these systems.

Information about the formal structure and informal functioning of national systems of education that is necessary in order to assign each country to these categories is of course best obtained through collaboration with national specialists. One prominent contribution that has taken this path is Shavit and Müller's edited volume on school-to-work transitions (1998). I draw on their labour as well as that of Buchmann and collaborators (Buchmann and Dalton, 2002; Buchmann and Park, 2005). For countries not included in those existing classifications, I consult various narrative descriptions of national education systems (Postlethwaite, 1995; OECD, 1996; Robitaille, 1997; Eurydice, 2006). Appendix 2 provides a very brief description of each national education system that should serve to illustrate the arguments behind my classificatory decisions. These descriptions also illustrate the great degree of path-dependence that can be observed for an institutional characteristic as fundamental as the stratification of the education system. This fact eases the problem of temporal change in institutional settings that cross-national comparisons of this kind normally face. For those still suspecting a neglect of historical change in the structure of national education systems and an illegitimate bias towards present conditions, it should be reaffirming that when the institutional analysis is restricted to the youngest cohort of respondents the same conclusions arise (results not shown).

Table 5 locates the countries included in this analysis on the stratification dimension as well as two other dimensions to be described subsequently. Anglo-Saxon countries (CAN, GB, IRE, NZL, USA) as well as Scandinavian countries (FIN, NOR, SWE, DEN) in general score low on this dimension. Most Continental European countries (GER, CH) with their intense differentiation at the secondary level (e.g. into 'Hauptschule', 'Realschule', and 'Gymnasium' in the German case) are located at the other extreme. To preclude the common misunderstanding that the US should be regarded as a highly stratified education system even in comparison with European systems, the reader can be directed to Rubinson (1986: 520–523) who not only provides a concise description but also a careful theoretical explanation of the main differences between these systems. The middle position of all former socialist countries (CZE, HUN, POL, SVN) presumably arises from the contradictory socialist objectives of 'meeting the manpower goals dictated by central planning and expanding access to education for the working class and for farmers' (Heyns and Bialecki, 1993).

The institutional effect of stratification can now be assessed in a straightforward way. A linear regression of the degree of educational mobility on institutional characteristics shows that the effect of stratification is—as hypothesized—negative, strong, and despite limited statistical power ($N = 19$) highly significant (Table 6, model 1).[11] Highly stratified and more so very highly stratified education systems are associated with a significantly lower degree of educational mobility. Figure 2 illustrates this point further. Very highly stratified education systems (Germany and Switzerland) fare worse than virtually any other country regarding their degree of educational mobility (with the exception of Slovenia). While most highly stratified education systems also show lower than average educational mobility rates there remains a good deal of variation within this category of countries: Northern Ireland and to some degree also the Czech Republic and Poland show comparatively high educational mobility despite their stratified education system. Educational mobility is clearly most marked in countries with a comparatively low degree of educational stratification

Table 5 Stratification, standardization, and privatization of education

| | Stratification | | |
Standardization	0 (low)	1 (high)	2 (very high)
0 (low)	CAN, **GB**, **USA**	**BEL**, **NIR**, SVN	
1 (high)	**DEN**, FIN, IRE, NZL, NOR, SWE	**CHL**, CZE, HUN, ITA, POL	GER, CH

Partly based on Müller and Shavit (1998), Buchmann and Dalton (2002).
Note: Bold letters indicate comparatively high prevalence of private education.

Table 6 The institutional context of educational mobility: regressions

	(1)	(2a)	(2b)	(2c)
Highly stratified	−0.16** (0.07)	−0.16* (0.08)	−0.16** (0.07)	−0.17* (0.08)
Very highly stratified	−0.32** (0.12)	−0.33** (0.12)	−0.30** (0.12)	−0.33** (0.13)
Standardized		0.01 (0.08)		
Strong private sector			0.08 (0.08)	
Relative size of PSE				−0.002 (.007)
R^2	0.37	0.37	0.41	0.37

*$P < 0.1$, **$P < 0.05$, ***$P < 0.01$.

Note: Measurement of independent variables as reported in Table 5; the 'relative size of the PSE' sector is conveniently taken from the nationally representative IALS data.
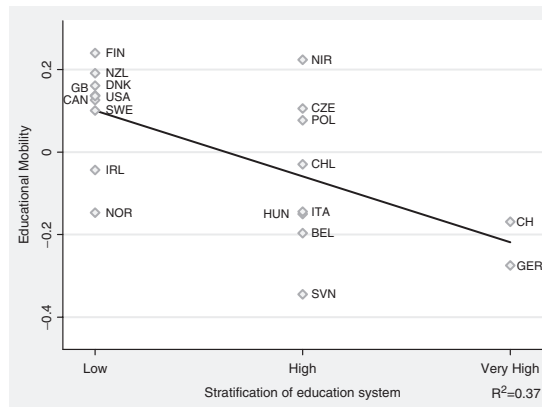
Figure 2 Educational mobility and stratification of the education system.

(exceptions are Ireland and Norway). Overall, this yields strong support for the hypothesis that the effects of parental education on individual attainment are stronger the more significant and rigid the selection of students into different educational strata. The fact that very early selection of students is especially detrimental to equality in educational opportunities is amply documented by the German and the Swiss case.[12] Also, stratification seems to be a very consequential institutional characteristic insofar as it alone explains as much as 37 per cent of the cross-country variation in educational mobility rates.

Of course, the countries examined here differ on more than just the stratification dimension. As a matter of fact, one could derive hypotheses about the relationship between many specific institutional features and the degree of educational mobility—a task that has been taken on elsewhere (Pfeffer, 2007).[13] Common candidates for further institutional characteristics are the standardization of education (i.e. the degree to which the quality of education meets the same

standards nation-wide), the prevalence of private education, and the inclusiveness of the post-secondary sector. It must suffice to note that none of these institutional features shows any independent effect on educational mobility nor—more importantly for the argument made in this article—do they mediate the observed relationship between stratification and educational inequality (Table 6, models 2a–c). The results of the institutional analysis presented here can, therefore, easily be summarized: while educational inequality is clearly associated with the stratification of education systems it does not appear to be influenced by other institutional characteristics.

Conclusions

This article approaches the study of educational inequality in a new way. By using log-linear and log-multiplicative models of educational mobility tables it examines the global degree of intergenerational status transmission across all educational levels. It does so for as many as 20 nations, some of which have not been included in prior comparative research. A strong association between parental education and the educational outcomes of their children is detected for all nations. It is shown that this association has been mostly stable across the 20th century in virtually all countries. In this sense, I find 'persistent inequality' in educational opportunities. This article also addresses the grievance that so far there is only 'scattered knowledge' about the ranking of nations in terms of educational inequality. The presented educational mobility ranking partly alleviates this unfortunate situation. The conceptual validity of this ranking profits from the preceding finding of temporal stability, which suggests that educational mobility patterns and rates can be perceived as steady and pervasive characteristics of nations.

In an effort to explain the cross-national variation in educational mobility, one central institutional characteristic of the education system has been shown to be influential. The extent to which educational opportunities are stratified at the secondary level is negatively and strongly associated with educational mobility. Rigid systems with dead-end educational pathways appear to be a hindrance to the equalization of educational opportunities, especially if the sorting of students occurs early in the educational career. The theoretical explanation offered for this relationship presumes an active role of parents in managing, guiding, and advising their children in their educational careers. The degree of stratification of the education system determines the level to which such parental assistance becomes a crucial resource for children confronted with difficult educational choices. It has been argued that this kind of resource has in many instances been neglected in rational choice models of educational decisions. The further development of the rational choice framework would thus profit from a more detailed attention to this and other conceivable types of resources necessary for the realization of educational decisions.

The empirical results presented here await validation with different data. The rank order of nations in terms of educational inequality might hinge on inconsistencies in the underlying comparative measure of education. Specifically, this article focused on the vertical hierarchy of education to the neglect of the horizontal differentiation of educational opportunities. Although some evidence was provided for the stability of the ranking when horizontal differentiation is taken into account, a genuine replication should draw on new data, and a different classificatory system of educational degrees that might do more justice to the complexities of highly stratified European systems.

In their 2005 review, Breen and Jonsson note that 'research on inequality of opportunity has been overwhelmingly oriented toward empirical description, with the consequence that convincing explanations of, for example, cross-national variation in the origin-education [...] association are lacking. A first step toward explanation is to use our existing knowledge to produce an exhaustive list of the [...] institutional factors that impinge on the opportunities of children, and to measure their relative importance in particular societies' (p. 236). The results of this article suggest that stratification is the dominant institutional factor in this regard. The non-effect of the degree of standardization of the education system, the prevalence of private schools, and the openness of the post-secondary sector are findings in their own right. Of course, this list of institutional characteristics is far

from exhaustive and future research might consider other factors, such as the length of the school year and school day, the mode and timing of early childhood education, and others. These additional institutional factors might explain part of the remaining variation in educational inequality—especially within highly stratified systems.

Also, the rather crude indicators of institutional structure used here certainly miss many national idiosyncrasies that can be much better captured by in-depth national studies. Such qualitative studies would also be helpful in understanding apparent national exceptions found here. For instance, it is not clear why Norway appears to be the only Scandinavian country that ranks below the international average in terms of educational mobility, or why Northern Ireland shows relatively favourable mobility rates given the degree of stratification of its educational system. The variable-oriented comparative research entertained here is less apt to provide convincing explanations for these deviations.

A further alternative route of analysis should be taken by researchers who prefer to think of education systems as 'wholes' rather than arrangements of particular institutional characteristics. They should favour a typology of 'education models' to investigate the relationship between educational inequality and its institutional context. It indeed seems a promising avenue for future research to revive Hopper's earlier rather unsystematic attempt in building such typology.[14] The highly influential institutional stratification of education provides the basis for identifying an attribute space of educational institutions that can be reduced to a 'system of types' (Lazarsfeld, 1972). One likely result of such quest for specific *models of education* will be the recognition of the highly unequal outcomes of the '*Germanic model of education*'. Among the countries included in this analysis, the Germanic model would comprise countries which have modelled their education system along that of Germany, such as Switzerland, or historically been influenced by it, such as Hungary and former Yugoslavia (Slovenia)—all being countries at the very bottom of the educational mobility ranking.

I have alluded to the strong path-dependency of educational institutions. In many countries, the general organization of education has remained practically unchanged throughout the 20th century. Nevertheless, one should not pre-maturely conclude that the findings of this article would be entirely irrelevant to educational policy. It is not true that fundamental changes to the institutional structure of education are impossible or even unthinkable—and that in this sense education systems would be unalterable 'wholes' with

fixed basic parameters. One can for instance cite the Swedish case where the transformation of a historically highly selective system into a comprehensive one has explicitly been based on the political objective of reducing educational inequality. The abolishment of extreme institutional stratification has also recurrently and increasingly been subject to political and public debate in countries like Germany where there seems to be the greatest need for it.

Notes

1. A further interesting question is whether the intergenerational association of educational status is different for women and men. This comparison is skipped due to space limitations here, but can be found elsewhere (Pfeffer, 2007).
2. This explanation differs from the argument of cultural capital theory, which posits that highly educated parents equip their children with an understanding of the dominant culture and an ability to act within it. The presented mechanism provides not only a less abstract concept of education-relevant resources but also circumvents the kind of circular argumentation introduced when educational attainment is used as a proxy for cultural capital.
3. Cameron and Heckman (1998) critique the Mare model for implying a myopic behavioural model (which should not disturb sociologists who believe in individual uncertainties about future returns to education), for arbitrary distributional assumptions, and for the inability to solve unmeasured heterogeneity problems. Ordered logistic regression models that they propose as an adequate alternative to the Mare model have recently been applied by Hout (2007).
4. Parents' highest educational level is determined by the highest educational degree of either the respondents' father or mother. This decision is justified by the fact that the presented mechanisms underlying the transmission of parental status plausibly depend on the highest status of either parent. In 26 per cent of the cases the highest status is held by the father, in 15 per cent by the mother, and in 59 per cent both parents possess the same educational degree—an impressive manifestation of educational homogamy.

5. In only a very small number of cases this might still fail to capture the highest educational degree of individuals who are in the process of obtaining a post-secondary degree at the time of the interview. When asked about their current working situation, on average 1 per cent of the respondents identified themselves as being a student or being in a work programme (unfortunately, the survey did not distinguish between these two categories). The potential bias can, therefore, be expected to be very small. What is more, it would produce conservative estimates of the degree of intergenerational status transmission in education: the attainment of individuals who ultimately reach the highest possible educational status is (at best slightly) underestimated. As intergenerational status association is highest at the extremes of the status hierarchy (U-shape) one would consequently underestimate the intergenerational persistence of educational status.
6. A separate IALS survey item records whether the completed secondary degree of the respondent is of academic or of vocational nature. Since this item is only available for a subset of countries (excluding Great Britain, Ireland, Northern Ireland, and Sweden) and since it does not form part of the standardized assessment of educational degrees, this additional information is merely used for the following stability analyses. The ISCED3 category is divided into vocational and academic degrees for the respondent, but not the parent for whom no such information is available (incidentally leading to a liberal estimate of the degree of mobility in highly horizontally differentiated systems, since the intergenerational association in the *kind* of education is concealed). Both the descriptive outcome (ranking of nations) and the analytical results (institutional effects) very closely match the results presented here and lead to the same conclusions as those based on the original ISCED classification (results available from the author).
7. The data are not weighted to account for the complex survey designs that vary between IALS countries because no information on primary sampling units is provided. The model choices in the analyses to come, however, would not be altered by applying an overall design weight of

a reasonable (yet arbitrary) size. The raw cross-classifications are available from the author.

8. For a concise and accessible review of the statistical models used here, the reader is also referred to Breen (2004b).

9. One could argue that the unsatisfactory model fit of the UniDiff model would be indicative of cross-national differences in the *pattern* of association. After all, educational inequalities might be distributed very differently across educational levels from country to country. This argument can be addressed by means of a model developed by Goodman and Hout (1998). In plain terms, it allows for differences in the level *and* pattern of association. Fitted to the data, the Goodman-Hout model cannot be judged superior to the UniDiff model ($L^2 = 507.8$, $df = 254$, $P = 0.000$, $rL^2 = 93.5$, $\Delta = 3.3$, BIC $= -2172$). The latter model thus still appears to be the most adequate basis for the analyses to follow.

10. However, in order to prevent a common mis-understanding one note might be necessary: the fact that Sweden does not stand out as an excep-tionally positive case is in line with earlier research that considers it to rank in a middle position regarding the overall degree of educa-tional inequality (Müller, 1996).

11. In comparative analyses of this kind, the assess-ment of statistical significance does not aim at inferring the observed effects to a larger popula-tion of countries. The relation of coefficients and their standard errors nevertheless indicates the degree of confidence, we can hold in claiming these effects to be meaningful, i.e. not just due to random error (see also Kenworthy, 2007).

12. It might be worthwhile to point out that the negative effect of *very high* institutional stratifica-tion does not solely rely on these two cases. In the regression analysis, they are separated from countries with *high* stratification for which a clear negative effect can also be confirmed.

13. An adequate macro-sociological analysis should in addition also assess which central features of society as a whole may impact the phenomenon under investigation. For this purpose, the reader is referred to the same reference which also assesses the main existing sociological hypotheses that link broad societal characteristics to educa-tional inequality.

14. One more recent classificatory attempt that remains within the borders of one country is Below's (2002) typology of state education systems that appears to have empirical validity for Eastern German federal states.

Acknowledgements

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Appendix 1

Notes on Country Data

Australia

Data are not available to the broader research community and, therefore, not part of this analysis.

Germany

German respondents could have received their education in either the Federal Republic of Germany or the German Democratic Republic. The two states were obviously quite different in terms of their macro-economic structure. Apart from some basic similarities, their education systems also differed in important aspects (Below, 2002). A rough but the only available proxy for identifying individuals who might have completed their education in the former German Democratic Republic is the information whether the respondent lived in the Eastern part of Germany at the time of the interview (1994). I exclude East Germans (23 per cent of the total German sample) who—due to modest inner-German migration rates at that time—are most likely to have grown up in the German Democratic republic. Including these cases nevertheless leaves my findings unaffected (results not reported).

Netherlands

Unfortunately, the Netherlands must be excluded from the cross-national comparison because of coding irregularities in the ISCED scheme. The Dutch IALS team failed to single out educational degrees that should fall into the ISCED5 category.

New Zealand

The case selection steps described result in the exclusion of a considerable share of cases (35 per cent), since a large proportion of individuals did not report their parents' educational status. This is because New Zealand was the only country that allowed respondents to answer the IALS questionnaire but not the additional background questionnaire. While New Zealand's data, therefore, should be interpreted with some caution, they do not produce any kind of exceptional results that could be ascribed to the larger amount of missing information.

Switzerland

The analyses presented apply only to the German-speaking part that constitutes more than 60 per cent of the total Swiss population. A replication of the national analyses for the French- and Italian-speaking parts show no exception to the general patterns reported (results not shown, see also notes to Table 4).

Great Britain

The data from England and Wales are pooled but due to the low number of cases, I exclude Scotland that would otherwise surely constitute an interesting comparative case on its own (Raffe *et al.*, 1999). Northern Ireland on the other hand can be analysed separately as a different education system with a sufficient number of cases.

Appendix 2

Brief Description of Education Systems

The following synoptical descriptions of national education systems lay no claim to completeness, but instead focus on some selected institutional aspects that are central to this project. Furthermore, they apply to the period between the early 1940s and the late 1980s when the IALS respondents participated in the education system.

Belgium (Flemish community)

Historically, secondary education in Belgium was composed of one lower and one upper 3-year cycle and divided by general and vocational education. Only after political authority over educational matters was transferred from the central state to the Flemish language community in 1990 did secondary education take a more comprehensive form thanks to the introduction of a general framework for secondary education (combination of general, technical, artistic, and vocational education in comprehensive secondary schools). The constitutionally guaranteed freedom of education (since 1958) distributes organizational and financial responsibilities to three largely autonomous networks (*onderwijsnetten*: Flemish community; provincial or municipal authorities; subsidized private sector). The organizing body (*inrichtende Macht*; school board) within these networks has authority over the educational project.

Canada

The Canadian system combines elementary and lower secondary education into one programme and offers both academic and vocational courses at the upper secondary level in comprehensive schools. Despite growing influence of the federal government since the 1960s, education remains under the control of the 10 provinces and 2 territories. The extent to which provincial school systems are decentralized varies, but a strong ideological commitment to local control exists. Local school boards operate schools and local property taxes have traditionally been an important part of educational financing (but decreasingly so in the present).

Chile

After 8 years of primary education, students choose between academic-humanistic and technical-professional high school. While both high school types grant access to post-secondary education, a much larger share of students who graduate from an academic-humanistic school go on to higher education. Despite radical efforts by the military regime (1973–2000) to restructure the Chilean education system, education still largely remains a national matter with curricular, and financial decision chiefly made by the National Ministry for Education.

Czech Republic

With the adoption of the Soviet school system in 1948, Czechoslovakia's comprehensive 'basic school' was extended from 4 to 8 years (and after the Velvet Revolution in 1989 to 9 years). Secondary education consists of either lower vocational education or secondary schools (*gymnasium/technicum*), with only the latter allowing application to post-secondary education. As a socialist country Czechoslovakia managed educational matters centrally to ensure highly standardized provisions across the country. The transition to capitalism and creation of the Czech Republic only slowly introduced decentralization tendencies.

Denmark

The Danish *folkeskole* is a comprehensive basic school that comprises primary and lower secondary education. Since 1967, the upper secondary level not only consists of the traditional 3 year academically oriented gymnasium but also an alternative 2 year higher preparatory course (*HF*) both of which provide a general education and—thanks to explicit political will—a route to post-secondary education. While some degree of local self-government is allowed for, educational financing is largely centrally controlled, and curricular guidelines (which are relatively specific for upper secondary schools) are issued by the national Ministry of Education.

Finland

The comprehensive primary and lower secondary school (9 years) has its roots in the time when Finland was under Swedish rule. Upper secondary schools that were part of the characteristic folk school system only became separate institutions in the 1970s. Both general and vocational upper secondary education as it now exists gives access to further education on the post-secondary level. Despite an increase in decision making at the local level since the 1980s, educational regulations such as curricular guidelines and student assessment are still centrally set by the National Board of Education.

Germany

German students are sorted into one of three clearly hierarchically ordered secondary school types after grade 4: 9 years of *Gymnasium* prepare for post-secondary education while the *Hauptschule* lasts for only 5 years and traditionally prepares for later vocational education in form of apprenticeships. The *Realschule* lies in between these two types and is most often followed by attendance of higher vocational schools. Although federal states (*Länder*) have jurisdiction over educational matters, a high degree of standardization across all states is guaranteed by coordination through a standing conference of states' educational decision makers.

Great Britain (England and Wales)

The British school system has a complex structure and eventful history. One general trend throughout the 20th century though was the restructuring of the secondary sector towards a more comprehensive system to allow more than just students from grammar schools the progression to the post-secondary level. Regarding the government of education, one can note a coexistence and often competition between two regulatory levels: the national Department of Education and local education authorities. Despite important standardization trends (e.g. the 1988 centralization of curriculum development), governing bodies at the local level maintain a high degree of autonomy. The classification of Great Britain as an unstandardized system is nevertheless contested in the literature.

Hungary

Socialist Hungary required its students to attend 8 years of primary schooling. After that several clearly hierarchically ordered options were (and in principle still are) available: 3 years of apprenticeship in a 'trade school', 4 years in technical secondary school, or academic grammar school (*gimnásium*). The latter two granted diplomas, which were required for further education at a university. Though decentralization of educational administration slowly began in the 1970s and then accelerated after 1990, strong central state control of education as characteristic for socialist countries has dominated the Hungarian system.

Ireland

Primary school encompasses 8 years and is followed by a system of secondary education that is substantially differentiated in a horizontal sense (four different types: secondary, vocation, comprehensive, and community) but not in a vertical sense. Two cycles of post-primary education conclude with a leaving exam that confers access to post-secondary education. Although schools are mostly owned by religious community groups, the locus of important educational decision making lies on the national level with the Department of Education defining curricula, developing nation-wide school leaving exams, allocating funds, and the like.

Italy

In 1962, a unitary system of compulsory primary and lower level secondary education replaced a two-tier system of lower level secondary education. Higher level secondary education remains highly differentiated into several segments: 5 year institutes of general education and various vocational schools of either 5, 4, or 3 year length. Since 1969, students graduating from either general or vocational 5 year schools qualify for post-secondary education; students from 4 year secondary school can attend an additional preparatory course for access to post-secondary education. Dating back to a law from 1859, power in educational matters has been highly concentrated at the national level (national curricula, central inspectors, etc.).

New Zealand

Up to the age of 16 students attend one of several possible types of comprehensive school ('primary school', 'primary' plus 'intermediate school', 'composite school'). Secondary education is also comprehensive and shows a low degree of within-school streaming by subject that allows students to prepare for both academic and vocational careers. Traditionally, central governance dominates educational policy in New Zealand (central funding, national curriculum, etc.) although major reform of its administrative structure in 1989 points towards decentralization of power.

Northern Ireland

In central features, especially the locus of political control, the education system of Northern Ireland resembles that of England and Wales. Yet, until recently one important difference was the maintenance of a secondary education structure that is divided into non-selective intermediate schools up to age 16 on one hand and grammar schools that can only be attended after a successful transfer test at age 11 on the other hand. Only grammar schools allowed access to post-secondary education.

Norway

The education system is marked by a traditionally strong commitment to comprehensive schooling throughout the primary and secondary sector (*Grunnskole*). General and vocational upper secondary programmes normally start at the age of 16 and are both pathways to higher education. The national Ministry of Education draws up national curricula and allocates funds to municipal and country authorities who were only granted autonomy in their expenditure decisions in the late 1980s.

Poland

Polish students attend one common school for the first 8 (prior to 1969 seven) years of their educational career. Afterwards they choose between distinct types of secondary schools: lower vocational schooling that is considered terminal or academic secondary education at either a *liceum* or *technicum* (reflecting the traditional emphasis of the Polish education system on technical education). Both *liceum* and *technicum* end with the *matura* certificate that is required for the transition to higher education. In the socialist state, the locus of control of educational matters was exclusively on the national level.

Slovenia

The Slovenian education system has seen some of the most sweeping structural changes throughout the 20th century. Originating from the Austrian–Hungarian system, it used to select students after fourth grade into either 4 years of further primary schooling or 8 years of '*gymnasium*'. In 1958, comprehensive school covering the first 8 years was introduced and secondary education largely resembled that of other socialist countries (4 year general secondary or professional school as well as shorter vocational programmes). Between 1980 and 1990, this tripartite structure was temporarily replaced by a comprehensive secondary school system. Arguably, traditional community control of education could be maintained throughout the 20th century due to the peculiar character of 'soft socialism' or 'self-management socialism' of the Yugoslavian state (1976–1990).

Sweden

Sweden's present school system is known as one of the most open and structurally uniform systems. Compulsory, comprehensive schooling up to age 16 (9 years) is normally followed by the transfer to an integrated upper secondary school (*gymnasieskola*) that comprises an academic, general (semi-vocational), and vocational branch. This comprehensive structure of education has gradually replaced what used to be a highly stratified system (comprehensive *grundskola* introduced in 1962 after an experimental phase in the 1950s; integrated upper secondary school in 1971). Since then the Swedish system has practically gotten rid of any dead-end paths. Efforts to restrict the strongly centralized educational administration and control can be noted for the 1980s. Extensive market-oriented reforms began in the 1990s and, therefore, do not fall into the time frame of interest here.

Switzerland

In its central structural features the Swiss education system corresponds to the German system: it selects students early in their career (after grades 4–6 depending on the canton) into one of three types of secondary education. *Gymnasium* prepares for later post-secondary education, *Sekundarschule* (corresponding to the German *Realschule*) for entrance into higher level vocational programmes, and *Realschule* (corresponding to the German *Hauptschule*) is typically followed by vocational apprenticeships. Although the 26 federal states (cantons) possess nearly exclusive regulatory authority over educational matters, a national Conference of Cantonal Directors of Education (*EDK*)

ensures a relatively high degree of commonality across cantons. [The French- and Italian-Swiss systems combine features of the Swiss–German systems with those of France and Italy, respectively.]

USA

Student pathways up to higher secondary education are of a fairly linear character: students move from elementary school, through middle school (grades 6–8), or junior high school (grades 7–9) into (senior) high school that ends after grade 12 and confers access to post-secondary education. Ability-based tracking within schools is common. In nearly all states regulation of education occurs at the local level. Local school boards have high control over educational content and structure and financial resources are chiefly derived from local property taxes and distributed within local school districts.