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Is Meritocracy Not So Bad After All? Educational Expansion and Intergenerational Mobility in 40 Countries

Herman G. van de Werfhorst[a,b]

Abstract

In the face of continued socioeconomic inheritance, the belief that the simple expansion of educational opportunities will create meritocratic societies has been met with skepticism. It is well documented that within expanding educational systems, class-advantaged families attempt to secure further advantages for their offspring. Conversely, for many, the modernist belief that educational expansion is a means to achieving a fairer society remains compelling. Studying trends in intergenerational occupational mobility in 40 countries from four continents, I examine whether educational expansion enhances occupational mobility, and whether such trends are counteracted by heightened persistence between social origin and destination within education groups. The results indicate that educational expansion over time, and the policies supporting it, are linked to improved intergenerational occupational mobility. Furthermore, this increased mobility through expanded educational opportunities is not negated by a strengthening of within-education elite persistence in occupational status, suggesting that occupational mobility patterns can genuinely change through educational expansion. The modernist ideology around educational expansion as a driver of social mobility may warrant renewed attention.

Keywords

intergenerational mobility, social stratification, education, comparative research

A classical question in the social sciences is whether and how educational expansion matters for the level of social mobility in developed economies. Educational expansion may improve educational opportunities for all, especially for students from less advantaged backgrounds, and thereby alleviate the level of intergenerational social mobility in societies (Ballarino et al. 2009; Beller and Hout 2006; Bernardi and Ballarino 2014; Breen 2010; Katrňák and Hubatková 2022; Pfeffer and Hertel 2015).

Insights into the role of educational expansion are crucial for contemporary debates on the desirability of the societal model of meritocracy. With modernization, societies became increasingly oriented to education as a channel to match the increasing demand for a skilled labor force. Expansion and meritocratization are "complementary processes of the progressive bureaucratization and

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rationalization of Western industrial society" (Windolf 1997:125). Societies became more "meritocratic," according to modernization theory, leading to higher levels of intergenerational social mobility, because (a) education expanded to meet the increased demand for skilled labor, (b) merits defined by education became the central distributive factor for reaching more advantaged positions, and (c) inequalities in access to education by socioeconomic background were contested to reduce the waste of talent (Bell 1974; Maas and van Leeuwen 2016; Treiman 1970). An essential element of the skill-oriented model was that societies focused on expansion of education (Goldin and Katz 2009).

However, the meritocracy, defined as a societal model in which social positions are distributed on the basis of merit, has been criticized for a number of reasons. Critics consider the meritocracy a "deeply elitist project" (Mijs and Savage 2020:397). First, the meritocracy personalizes success and failure, ignoring the relevance of structural barriers to achievement (Anderson 2007; Sandel 2020). Second, meritocracy legitimizes economic inequalities that result from interpersonal differences in skills and talent (Batruch et al. 2023; Mijs 2021). Third, even if access to education equalizes, resourceful families find new ways to keep their children ahead within expanding educational categories via the quality of the institution students attend or the choice of selective (e.g., honors) programs or particular fields of study (Jackson et al. 2008; Jerrim, Chmielewski, and Parker 2015; Torche 2011; Van de Werfhorst and Luijkx 2010). Hence, the empirical claim that providing access to more advanced levels of education will improve opportunities for less advantaged families is falsified by the increased relevance of more detailed educational categories that ultimately put a break on rising levels of social mobility.

This empirical critique implies that efforts to increase educational participation rates will not increase intergenerational mobility. But is this true? If educational expansion has historically significantly enhanced opportunities for wider groups of populations to obtain higher status positions, would that not imply that wider access to education could still be an effective route to a more egalitarian society? What if the effects of educational expansion are so large that no counter-trend created by elites for their children would be sufficient to erase mass gains? The critique of the meritocracy mostly comes from the United States, a society where the educational system has arguably become less meritocratic. Rising tuition fees in higher education (Hout 2012), and rising socioeconomic segregation across schools (Owens, Reardon, and Jencks 2016), have made it harder for students from less advantaged families to reach higher levels of attainment.

To assess the role of educational expansion in processes of intergenerational mobility, it is crucial to integrate a comparative perspective looking at many different contexts with different educational policies and distributions, with a statistical decomposition approach that allows the researcher to examine indirect and direct paths in the mobility process. Educational expansion may, for instance, affect socioeconomic inequality in education, the returns to education in the labor market, or the direct effects of family background on occupational attainment for people within the same level of education. Importantly, following the *compositional argument*, if the direct association between social origin and destination is lower among higher-educated groups than among lower-educated groups, educational expansion itself can remove barriers to social mobility (Breen 2010; Hout 1988; Pfeffer and Hertel 2015).

The current state of the art in the literature decomposes intergenerational mobility for a few contexts (e.g., two U.S. cohorts in Bloome, Dyer, and Zhou 2018) or for countries separately (Breen and Müller 2020). Little is known about the possible role of expansion-promoting policies for the various components of the mobility process. This is unfortunate, as the level of expansion is simply a distributional characteristic, and its effect can only be understood through the

contextual circumstances under which it takes place (Jackson 2021).

A more encompassing empirical analysis covering a large set of societies and the role of expansion for various elements of the intergenerational mobility process is still lacking. I integrate examination of the role of contextual factors for intergenerational mobility—in particular educational expansion and policies promoting it—within the analytic decomposition literature by addressing the following research question: How does educational expansion matter for intergenerational occupational status mobility?

Decomposition is important to test three broad theoretical claims about social change, meritocratization, and intergenerational mobility. The first claim is that *context matters*: through expansion (and the policies promoting it) intergenerational persistence declines both through education and directly from parents' occupational status to children's occupational status. Tendencies toward meritocratization are so strong under this model that compensatory processes among advantaged families to counter equalizing trends are not so strong that they can cancel out the increased openness of society. A second claim is that *context does not matter*: with educational expansion, resourceful families will keep their children ahead in their educational and occupational attainment, leading to highly similar patterns of mobility across societies and across time. A third claim centers on *direct persistence*: even if expansion equalizes educational attainment, the direct association between origin and destination (i.e., within broad levels of educational attainment) is much more persistent to change and may even strengthen to compensate a loss of advantage by resourceful families.

This study analyzes the intergenerational mobility process for many different countries and birth cohorts, covering four continents, using internationally comparative survey data. Using country fixed-effects models, I describe whether and how educational participation rates, and policies likely promoting them, are associated with the various components of the mobility process. The results are strongly in line with the claim that context matters: educational expansion reduces the intergenerational persistence of occupational socioeconomic status, both through education and directly from origin to destination. Possible counter-trends discussed in the literature, such as increased relevance of high-quality education within broad categories of attainment, increased roles of genes, or increased compensation by families via use of their resources, are apparently not so strong that they have modified the equalizing role of educational expansion. Together, these findings may give more credence to the modern claim that education is still a route toward a meritocratic society.

THEORETICAL BACKGROUND

Educational Expansion and the OED Triangle

A consistent finding in the social mobility literature is that social advantage, be it in the form of social class position, occupational status, or income, is transmitted across generations (Hout and DiPrete 2006). While the strength of such patterns may vary across time and place, it is undisputable that children of more advantaged families reach higher positions themselves, partly through socioeconomic differences in educational attainment, and partly directly. Social mobility is partly a function of structural change—children end up in different positions than their parents due to changing occupational structures—and partly due to "social fluidity," or relative mobility, the relative advantage that children reap from their parental background independent of structural change (Goldthorpe 2007).

A general structural-functionalist theory of social mobility would predict rising fluidity with modernization, because it would be both inefficient and increasingly morally disputed to allocate social positions based on family background (Parsons 1940; Treiman 1970). Yet, consensus has built that this

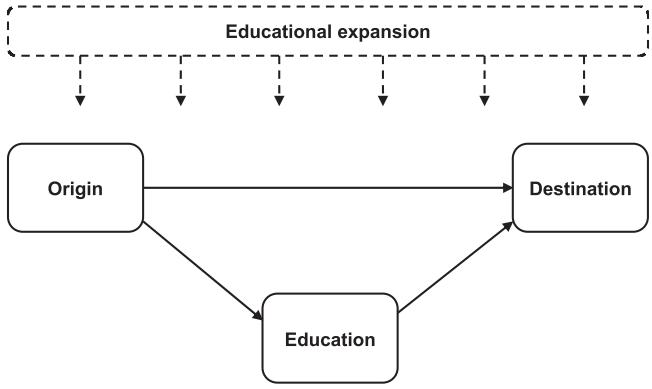

Figure 1. Educational Expansion and the Origin-Education-Destination Triangle
Note: Origin and destination refer to occupational status of the parents and the child, respectively. The path from Origin through Education to Destination is the indirect path (OED). The path running directly from Origin to Destination is the direct path (OD|E) that assesses the relation between occupational status of the parents and the children for individuals with the same level of education. The sum of these paths is the total intergenerational persistence of occupational status.

general hypothesis needs to be abandoned. As Goldthorpe (2007:160) writes, there is "scarcely . . . compelling evidence of a tendency towards greater social fluidity of the 'worldwide' and 'secular' kind that the functionalist theory would predict." Instead, rising levels of fluidity are found in specific time periods or countries (Breen and Müller 2020; Bukodi, Paskov, and Nolan 2020). It is therefore important to focus on education as an important mediator between social origin and destination, as processes in and through education could vary between societies and these may explain cross-national variation in (trends in) social mobility patterns.

An important conceptual model for such an analysis is the Origin-Education-Destination (OED) triangle (see Figure 1). This model decomposes intergenerational persistence of socioeconomic position (e.g., social class, occupational status, income) into an indirect path that connects Origin and Destination through children's education and a direct path that connects Origin and Destination independent of education, that is, within levels of educational attainment.

The mobility process can be decomposed into several elements, each of which may be affected by educational expansion. First, there is the OE path, which indicates the extent of inequality in educational attainment between families of different socioeconomic statuses. Second, the ED path indicates the returns to education in the labor market. Third is the direct association between origin and destination, that is, within levels of educational attainment. This direct path indicates that children from resourceful families generally achieve more advantaged positions themselves within the pool of similarly educated individuals (OD|E).

A fourth pattern emerges when origin and education interact in predicting destination. This interaction effect is usually negative, indicating that returns to education are lower for children from more advantaged backgrounds (Brand and Xie 2010), that is, the advantage children gain from advantaged backgrounds is stronger for individuals with lower levels of education (Bernardi and Ballarino 2016; Torche 2011). The heterogeneity in returns to education also varies across the career (Cheng et al. 2021). Note, too, that the descriptive finding of stronger OD associations for lower levels of education (e.g., non-college relative to college) disappears when a broader set of covariates is used to model the likelihood of going to college (Breen, Choi, and Holm 2015; Forster, van de Werfhorst, and Leopold 2021; Zhou 2019). In a comparative framework, as used in the present study, such covariates are typically not available.

Therefore, this study adopts a more macro-sociological approach to study the effects of promoting more education in a society on patterns of intergenerational mobility (explained below).

Three Theoretical Claims about Educational Expansion and Intergenerational Mobility

If we examine the societal context, specifically educational participation rates, in relation to the various components of the social mobility process, we can test three broad theoretical claims. While these claims could potentially be extended to other contextual factors such as social policies, politics, labor markets, or the economy, my focus in this study is on educational expansion and its underlying policies.

First, we can consider what we might call the "*contextual dependency theory*," which suggests educational expansion may have the anticipated impact on social mobility, both indirectly through education and directly from origin to destination. This means societal context, such as the level of educational participation in a society, can affect social mobility if education is made more equitable across students from diverse socioeconomic backgrounds, or if labor market outcomes become more equal across various education categories. For example, if resources like education vary more strongly between social origin groups, the intergenerational persistence of socioeconomic position becomes stronger (Hertel and Groh-Samberg 2019). Moreover, expansion can also influence social mobility without affecting the indirect path through what is known as the compositional hypothesis (Breen 2010; Hout 1988; Torche 2011): if social mobility is higher among more educated populations, expanding education can lead to increased social mobility, or reduced intergenerational persistence of socioeconomic positions. One reason why the compositional effect is found is that college graduates enter meritocratic labor markets, in which social origin provides less of an advantage. Another reason is that social origin is especially important for individuals without higher-level qualifications, as resourceful parents can more easily help their children than can less advantaged parents in such circumstances.[1] Following the contextual dependency theory, we can hypothesize that educational expansion is associated with reduced indirect and direct associations between origin and destination.

A second perspective of sociological scholarship is less optimistic about the social mobility effects of societal contexts and policies. This perspective, which we may call the "*ineffective context theory*," suggests societal context may not have an equalizing effect through education. In this view, policies aimed at expanding education or equalizing resources among families may not actually lead to more equitable education or affect the labor market value of educational qualifications. Examples of this perspective include cultural reproduction theory, which suggests resourceful families monopolize the educational system even if it expands (Bourdieu 1998). Another example is the maximally maintained inequality thesis, which argues that expanding systems can serve elites as much as anyone else (Raftery and Hout 1993).[2] Additionally, the compensatory advantage hypothesis posits that elites can ensure their children's educational attainment partly by being better able to deal with circumstances that might harm children's educational attainment (Bernardi 2014). From these perspectives, one could derive that children of well-educated families may benefit from educational expansion, leaving inequalities largely unaffected (at least until some level of saturation takes place in the take-up of levels of attainment by advantaged social classes).

Another version of the ineffective context theory argues that even if education is equalized across socioeconomic origins, education can become a stronger stratifier in the labor market, meaning the combined OE and ED paths do not improve social mobility levels through education (Jerrim and Macmillan 2015). In economics, this perspective finds support among scholars who challenge the "Scandinavian fantasy" by claiming

that educational mobility between generations is very similar in the United States and Denmark (Landersø and Heckman 2017). An interesting study on Finland showed that intergenerational persistence in educational attainment increased because inequality rose in one particular educational transition that expanded most rapidly (Härkönen and Sirniö 2020). Expansion does not necessarily improve social mobility. From the ineffective context theory, we can hypothesize that educational expansion is not associated with the strength of the indirect or direct association between social origin and destination.

A third theory departs from the indirect path through education and explicitly addresses trends *within* levels of education. In its most general form, this theory, which we call the "*direct persistence theory*," posits that, when equalizing tendencies through education occur in societies that would naturally promote social mobility, resourceful families will use alternative channels to maintain their children's advantage in the labor market within categories of education, thereby limiting social mobility.

These alternative channels could include detailed educational pathways not captured by the observed broad education categories, such as the quality of the educational institution, the field of study, or the attainment of postsecondary degrees (Alon 2009; Jackson et al. 2008; Jerrim et al. 2015; Shavit, Arum, and Gamoran 2007; Torche 2011). In this way, inequality is "effectively maintained" (Lucas 2001; Lucas and Byrne 2017). For example, following closure theory, Alon (2009) theorizes about how expansion can coincide with such compensatory forces within the educational system. Confronted with widening access to college education, elite institutions have become more selective by introducing selection on test scores (e.g., the SAT), and advantaged social classes take actions to enhance their children's performance on those tests. Relatedly, Shavit and colleagues (2007) concluded that higher-education expansion was "inclusive" by opening opportunities to attain a college education, but binary and diversified systems of higher education diverted lower-class students away from first-tier institutions.

Another avenue could be that family resources give offspring a direct advantage in the labor market when education is equalized (Bernardi and Ballarino 2016; Friedman and Laurison 2020; Pöyliö, Erola, and Kilpi-Jakonen 2018). For example, Friedman and Laurison (2020) theorize about a "class ceiling" that limits opportunities for nonelite children in high-level employment even within the pool of graduates of highly selective institutions. Similarly, Rivera (2012) found that large law firms recruit on cultural tastes that likely signal social class background, selecting among applicants with prestigious law degrees (although Mastekaasa [2004] did not find a direct origin-class effect on elite status in large Norwegian firms).

Less "agentic" versions of direct persistence theory might involve genetic sources of inequality. Even if education gets more equally distributed across social classes, adult attainments may persistently be reproduced across generations if genetic predispositions to socioeconomic success are transmitted from parents to children (Belsky et al. 2018). All in all, the direct persistence theory would lead to the hypothesis that, even if the indirect path gets weaker with more educational expansion, the direct path from origin to destination occupation, given one's education, gets stronger.

Why We Need a Decomposition to Test the Three Claims

The three claims about the effects of educational expansion on social mobility can be put to empirical test by means of decomposition. In its easiest form, we can make a distinction in the indirect O-E-D path, and the direct OD path given E. The sum of these paths equals the total intergenerational persistence. Table 1 summarizes the expectations following from the three broad theoretical claims.

The contextual dependence theory argues that educational expansion, or policies that promote expansion, reduces the OE slope (more equal opportunities in an expanding

Table 1. Theoretical Expectations on the Relationship between Educational Expansion and Components of the Occupational Mobility Process

	Educational Expansion Effects On:		
	Indirect Path	Direct Path	Total Intergenerational Persistence
Contextual dependence theory	Negative	Negative	Negative
Ineffective context theory	Zero	Zero	Zero
Direct persistence theory	Negative	Positive	?

system), or reduces the ED slope (Araki 2020; Bernardi and Ballarino 2014) (with a larger supply of qualifications, labor market returns go down, ceteris paribus),[3] which sums up to a reduced total intergenerational persistence. Ineffective context theory simply states that expansion does not matter for OE, ED, and the total intergenerational persistence. Policies toward expansion will not be effective to achieve more social mobility, because educational inequality is maintained, and school-to-work linkages are unchanged.

Direct persistence theory assumes that, even if the indirect path through education gets weaker as a consequence of expansion (or expansion-promoting policies), there will be compensation through the direct component, leading to stronger direct transmission within broad education categories. As noted earlier, this can happen within education through the detailed pathways within broad categories of attainment, or outside education when, for example, family networks or genes compensate for equalized educational attainments. A lot of sociological scholarship would assume that, when intergenerational persistence via education goes down, resourceful families compensate for their children's loss of advantage by indirect means. In other words, the direct path would get stronger with more expansion. Much of the critique toward the meritocracy emphasizes the increased relevance of such within-education processes.

With the decomposition, we can simulate what would have happened to the social mobility process if only the participation rates in various levels of education changed, and the covariances between origin, education, and destination stayed the same. This approach allows us to evaluate the compositional argument of social mobility. From the literature, we may think that expansion has quite a mechanical relation to social mobility. As Hout (1984:1358) writes: "Origin status affects destination status among workers who do not have bachelor's degrees, but college graduation cancels the effect of background status. Therefore, the more college graduates in the work force, the weaker the association between origin status and destination status for the population as a whole." Similarly, Breen (2010:368) summarizes the compositional argument as follows: "[I]f the origin-destination association is weaker at higher levels of education, and if educational expansion results in increasing shares of successive cohorts reaching higher educational levels, this compositional change will lead to a reduction in the gross association between origins and destinations." In our decomposition, inspired by Bloome and colleagues (2018), we can isolate and simulate the participation rates in various educational levels while keeping the covariances between origin, education, and destination constant.

RESEARCH DESIGN

Data

The analysis is based on a combination of international social survey data. First, I use rounds 1 to 7 of the European Social Survey (ESS, collected in 2002 to 2014), for which parental occupations were coded into three or four digits according to the International Standard Classifications of Occupations

(ISCO, Ganzeboom 2013).[4] Second, I use all available surveys from the International Social Survey Programme (ISSP) that contain occupational codes of both parents and children, collected between 1985 and 2019.[5] I study societal context at the level of country-cohort, for five-year birth cohorts from 1920–24 until 1975–79. Taking respondents age 35 to 70, limiting to country-cohorts with a minimum of 20 observations in each of three educational categories (see below), and with data on at least three cohorts, I use a total of 175,804 individuals from 297 country-cohorts and 40 countries. See Table 2 for a description of the sample sizes per country.[6]

I weighted the data in several ways. First, I used the individual sampling design weights provided by the ISSP and ESS teams. For the ISSP, this was done by the national teams for each wave, and set to 1 for country-years in which this was not provided. For the ESS data, I used the sampling design weight variable (*dweight*). Second, I added a weight derived from the individual-level data, referring to the lower share of less-educated respondents to have reported a parental ISEI score. More specifically, I reweighted individual cases by the data source and survey year–specific ratio of the sample proportion of one's educational group divided by the selected sample proportion of one's educational group. This individual-level weight variable I call "education-specific origin weight." The multiplication of these two weight variables constitutes the individual weight variable used in the final analysis. Robustness checks that omit this individual-level weight variable show that the individual weighting procedure has little effect on the results.

Third, I carefully analyzed the proportion of missing cases (on any of the Origin, Education, or Destination variables) relative to the total sample, by country-cohort. The mean proportion of individuals having missings on any of the OED variables relative to the total database is 0.46 (for origin 0.41, for education 0.05, and for destination 0.08). Appendix Figure A1 shows the proportion of missing values by country-cohort. Given the non-negligible number of missings, a "missing cases weight variable" is created by the inverse of the proportion of missing cases (on any of the three O-E-D variables), rescaled at mean = 1. A robustness check replacing the education-specific origin weight with the missing cases weight in creating the overall individual weight variable shows very little effect of whether and which weights are used. I thus use the education-specific origin weight variable, multiplied with the sampling design weight.

Besides the individual weight variable, because I use a two-step design for the decomposition analysis, I created a weight by aggregating social mobility parameters estimated by country-cohort on the individual-level data, to the country-cohort level (see below). This group-level weight variable is based on the inverse of the standard error of the intergenerational persistence measure, so that more imprecise estimates get lower weight. These estimation weights are rescaled to mean 1. The individual-level weight variable and the estimation weights are multiplied in the individual-level data, before aggregation was performed.

Variables

I follow a linear approach to social mobility, using rank scores for origin occupational status and destination occupational status, using the International Socio-Economic Index of occupations (ISEI, Ganzeboom, Graaf, and Treiman 1992; Ganzeboom and Treiman 1996).[7] Parental occupation was asked of respondents' (i.e., children's) situation when they were in their mid-teens. Destination occupation is asked about the current or last occupation.

ISEI is a well-known occupational status score intended for use in international comparisons, based on a weighted average income and education by detailed occupation. A different procedure has been used to achieve ISEI scores for the ISSP and ESS datasets. The ISSP surveys have used many different ways to code occupations over the years, including national codes and the International Standard Classification

Table 2. Sample Sizes per Country

Country	*N*	Country	*N*	Country	*N*	Country	*N*
Australia (AU)*	5,254	Denmark (DK) *^	5,336	Italy (IT) *^	1,261	Russia (RU) ^	4,273
Austria (AT)*^	5,713	Estonia (EE) *^	3,261	Latvia (LV) *^	1,307	Slovakia (SK) *^	3,785
Belgium (BE)*^	4,767	Finland (FI) *^	5,738	Lithuania (LT) *^	1,407	Slovenia (SI) *^	4,348
Britain (GB)*^	5,183	France (FR) *^	7,137	Luxembourg (LU) *^	1,240	Spain (ES) *^	4,545
Bulgaria (BG)^	3,718	Germany (DE) *^	14,894	Netherlands (NL) *^	6,211	Sweden (SE) *^	5,582
Chile (CL)*	799	Greece (GR) *^	4,157	New Zealand NZ) *	780	Switzerland (CH) *^	7,721
China (CN)	843	Hungary (HU) *^	10,327	Norway (NO) *^	5,989	Taiwan (TW)	1,871
Croatia (HR)^	1,788	Iceland (IS) *^	1,582	Philippines (PH)	2,380	Turkey (TR) *	1,092
Cyprus (CY)^	2,116	Ireland (IE) *^	4,981	Poland (PL) *^	5,768	Ukraine (UA) ^	3,272
Czech Republic (CZ)*^	8,600	Israel (IL) *	3,991	Portugal (PT) *^	6,506	United States (US) *	6,281

Note: Total = 175,804. Countries marked with * are OECD member states. Countries marked with ^ are part of Europe.

of Occupations (ISCO) of various years (ISCO1968, ISCO1988, ISCO2008). I assigned ISEI scores using crosswalks made available by the International Social Mobility File (ISMF) project (Ganzeboom et al. 1992; Ganzeboom and Treiman 1996).[8]

Rank scores are now the standard approach in studying intergenerational mobility in earnings (Bloome et al. 2018; Chetty et al. 2014). Rank scores are also valuable for studying occupational status mobility, because they relate to sociology's interest in intergenerational mobility after taking account of structural variations in the labor market across cohorts, countries, and generations (Song et al. 2020; Xie et al. 2022). Taking rank scores for parents and children separately, and by country and cohort, adjusts for changes in the occupational structure by design. Whereas the class mobility literature separates structural mobility from social fluidity by examining (margin-independent) odds ratios, the ranked approach of linear variables similarly neutralizes structural change by taking the rank scores of parents' and children's occupations by country-cohort. Both the ranked persistence approach and the assessment of social fluidity using odds ratios aim to find intergenerational associations after taking account of structural change; that is, intergenerational associations that are indicative of the level of social mobility in a society.

Given the nature of the data, with children reporting about their parents—as is the case in most mobility studies—parents' occupational structure is ranked by children's cohort. A consequence of the retrospective design is that we do not pay attention to differential fertility by parental status, which could have an independent effect on total mobility patterns observed in society (Breen and Ermisch 2017; Mare and Maralani 2006).

Education of the respondent (the child in the intergenerational data) is measured in three categories: lower-secondary or less; upper-secondary or some postsecondary; college degree or more. Again, the ISSP and ESS vary in how they assess education, with the ISSP using more idiosyncratic methods by country and survey year. I coded the education variable into three categories based on ISSP national codebooks. For the European Social Survey, education is harmonized in variables *edulvla* (rounds 1 to 4) and *edulvlb* (round 5 onward).

Occupational statuses of origin and destination are ranked in *ridit* scores by country-cohort. A *ridit* is similar to a proportional-rank score, but it takes the mean ranked value between the lower and upper bound of a category, and can therefore better deal with large categories (Bross 1958).

Besides the variables of the OED triangle, we are interested in the relation with context, in particular educational expansion and policies that promote expansion, all at the country-cohort level. I use two measures of tertiary educational participation: *university participation per 10 capita* from the Cross-national Time Series (CNTS) Data Archive when the respondent was 15 years old (Banks and Wilson 2022), and an aggregation of *the cohort's proportion of tertiary degree-holders* from the microdata. Then, I use the participation rate in *any level above lower-secondary education*, also from the microdata. Finally, I use *participation rates in secondary schooling per 10 capita*, also from the CNTS database, and again measured when the respondent was 15 years old.[9] As a robustness check, I estimated a structural equation model using the four expansion indicators as manifest variables of a latent educational expansion index.

I then investigate the relevance of two educational reforms that are predictive of the level of educational expansion and equalization of education, all varying between and within countries over cohorts. These variables are only available for a subset of European countries, based on an educational reform database (Braga, Checchi, and Meschi 2013): *minimum school-leaving age* and *tracking age*. These contextual variables are precisely matched to individuals' life courses in the microdata (assuming subjects went through education nominally). Both policies have been studied in the context of intergenerational social mobility (Pöyliö et al. 2018; Rauscher 2016; Reichelt, Collischon, and Eberl 2019; Sturgis and Buscha 2015).

A Decomposition Approach

Country is identified by *j*, cohort by *k*, and individuals by *i*. *D* signifies destination status, *O* origin status, and education groups are defined by *e*. A total intergenerational persistence measure is decomposed for each country-cohort separately, between a component that is established *between education* categories (i.e., the indirect path from origin through education to destination), and a component that is established *within education* categories (i.e., the direct path from origin to destination, for each educational category separately).

The decomposition is inspired by Bloome and colleagues (2018) and Torche and Corvalan (2018). The total intergenerational persistence for country *j* and cohort *k* is represented by β_1^{jk} in the following linear regression model (from Equation 2 onward, I omit superscripts ^{jk} for readability). The total intergenerational persistence measure is the sum, over all education groups, of the share of education group *e* (π_e) times the education-specific contribution to intergenerational persistence. This education-specific contribution to the intergenerational persistence B_e is a sum of an indirect path B_e^b and a direct path B_e^w. The indirect path includes both the OE and ED slopes. The first step of the decomposition approach is to estimate these indirect and direct paths for each country-cohort.

$$D_i = \alpha + \beta_1^{jk} O_i + \varepsilon_i \tag{1}$$

$$\begin{aligned}\beta_1 &= \sum_e \pi_e B_e = \sum_e \pi_e (B_e^b + B_e^w) \\ &= \sum_e \pi_e \left(\frac{(\mu_{ed} - \mu_d)(\mu_{eo} - \mu_o)}{\sigma_o^2} + \frac{(O - \mu_{eo})(D - \mu_{ed})}{(O - \mu_{eo})^2} \right) \\ &= \sum_e \left(\pi_e \left(\frac{(\mu_{ed} - \mu_d)(\mu_{eo} - \mu_o)}{\sigma_o^2} \right) + \pi_e \left(\frac{(O - \mu_{eo})(D - \mu_{ed})}{(O - \mu_{eo})^2} \right) \right) \\ &= \sum_e \left((\pi_e B_e^b) + (\pi_e B_e^w) \right)\end{aligned} \tag{2}$$

$$\beta_1^{jk} = \beta_{jk}^b + \beta_{jk}^w$$

The second step of the decomposition approach is to test whether the sizes of the indirect and direct paths of the social mobility process are related to educational participation statistics and policies promoting expansion measured at the country-cohort level (*C*). This is done with regression models on the country-cohort dataset, with weights used that are inverse to the standard error of the total persistence parameter β_1^{jk} from the individual-level analysis (see above). Given that the between- and within-components are related, I use seemingly unrelated estimation techniques that allow for a correlation between the error terms ε_{jk}^b and ε_{jk}^w of the equations predicting the between-component and the within-component (Equations 3 and 4).[10] The models include country fixed effects ζ_j. Robust standard errors are used. I performed robustness checks that include controls for time trends in mobility patterns.[11] I also estimated curvilinear slopes of expansion.

$$\beta_{jk}^b = \alpha + \gamma C_{jk} + \zeta_j + \varepsilon_{jk}^b \tag{3}$$

$$\beta_{jk}^w = \alpha + \gamma C_{jk} + \zeta_j + \varepsilon_{jk}^w \tag{4}$$

RESULTS

Descriptive Statistics and Overall Trends

Figure 2 shows how education has expanded across the countries under investigation, using the country-cohort database. In all societies, the proportion of the population with a college degree has risen, and the proportion with at most lower-secondary education has declined.

For the compositional argument to hold, we would need to see a baseline pattern in which the OD association gets weaker with achieved individual-level education. Figure 3 shows these results, based on a linear model estimated on the microlevel data including country fixed effects and clustered standard errors by country-cohort. The model predicts

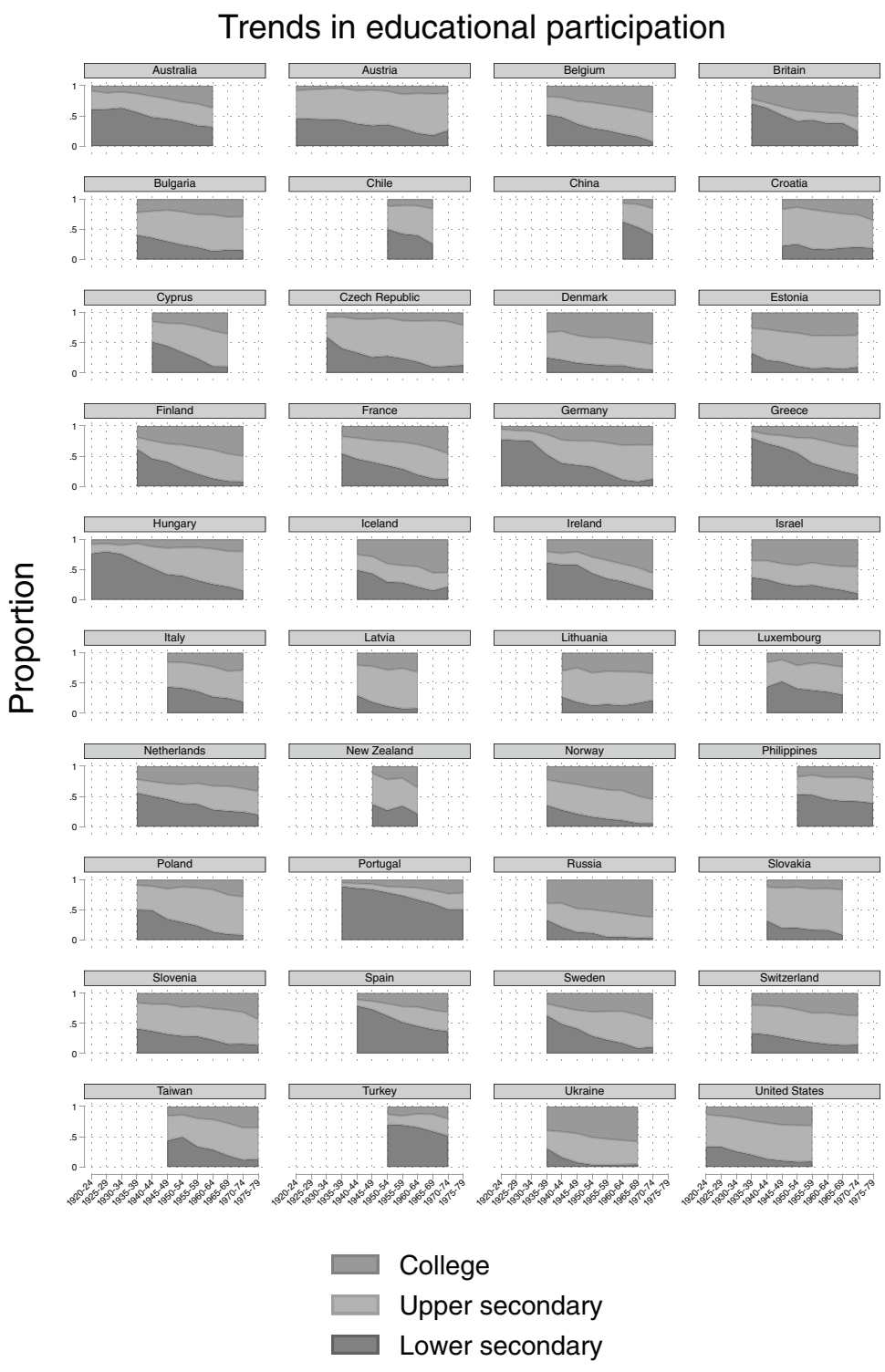

Figure 2. Trends in Educational Participation by Country
Note: This figure shows the proportions in each of the three educational levels over cohorts, by country. The graph shows educational expansion because the share of respondents with college education is increasing over time, and the share of lower-secondary education declines.

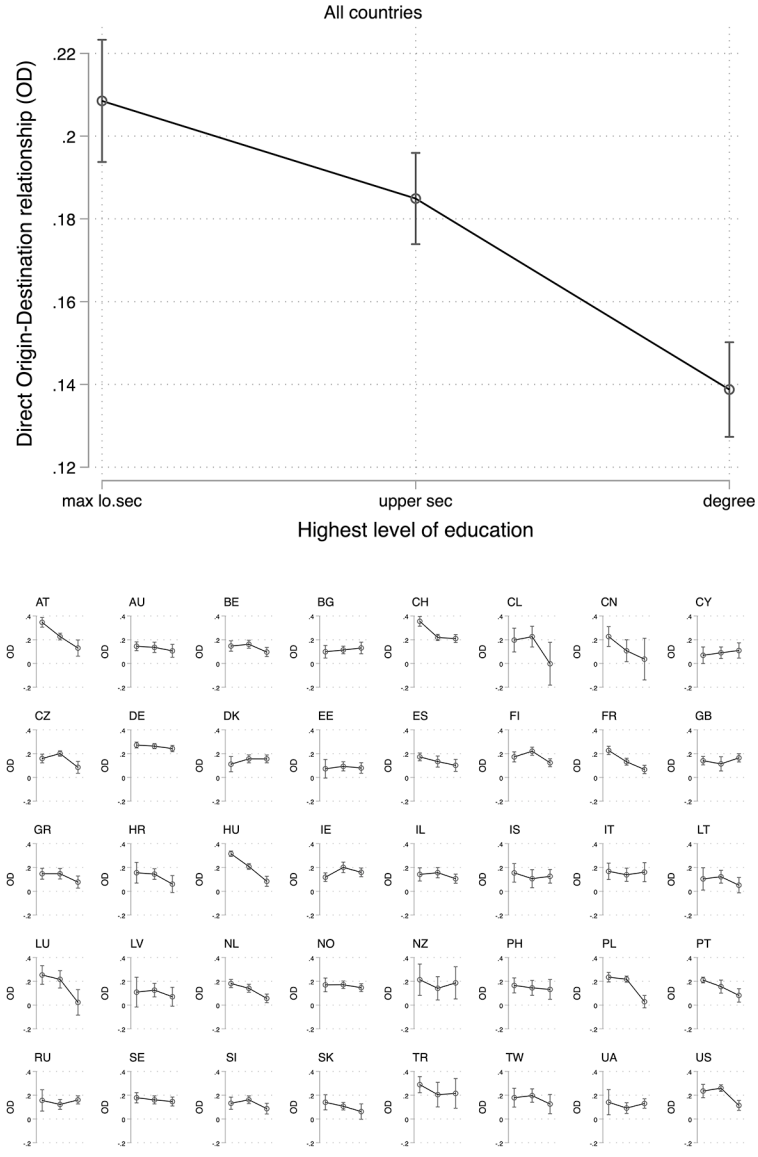

Figure 3. Status Attainment Model with Origin × Education Interactions on Microdata
Source: ESS and ISSP.
Note: Pooled model is with country fixed effects. Clustered standard errors by country × cohort. The upper part of the graph shows that the direct association between origin and destination is lowest for persons with a college degree, and highest for persons with at most lower-secondary education. The lower part of the graph shows these associations by country.

destination rank by origin rank and education categories, and adds interaction terms between education category and origin rank. In line with much of the literature, the OD association is weaker for graduates of tertiary education than for those with lower levels of education (Bernardi and Ballarino 2016; Torche 2011). This means the direct benefits one reaps from coming from a more advantaged socioeconomic background in terms of

own socioeconomic attainment are larger for individuals with less education than for those with more education. Conversely, coming from a relatively disadvantaged background has particularly strong negative repercussions on children's occupational attainment if they have less education.

The finding of Figure 3 is relevant for our analysis as the compositional argument rests on it: if indeed the direct origin effect is weaker among graduates from higher levels of education, educational expansion would predict a weakening of the total intergenerational persistence. With the present decomposition analysis, we can investigate whether expansion is relevant simply through such compositional change, or whether expansion is also associated with changing covariances between origin, education, and destination.

Table 3 shows the description of the country-cohort dataset. We have 297 country-cohorts with estimates of the direct and indirect components of intergenerational persistence, and estimates of educational expansion insofar as these are based on the microdata. The measures of secondary-school participation and university participation per capita, taken from external sources, have fewer observations (218 and 219). We have fewer observations for the two educational reform measures, as these are only available for a selection of European countries. The average total intergenerational persistence measure is 0.291. The total intergenerational persistence is split rather evenly between the indirect (OED) and direct (OD) paths. The correlation matrix of all country-cohort variables can be found in Appendix Table A1.

Figure 4 shows trends in the direct and indirect persistence components, and its sum being the total intergenerational persistence, by country. Countries differ in the estimated size of the intergenerational persistence and its components. Some countries, such as Austria, Belgium, Greece, France, Hungary, Ireland, the Netherlands, Norway, Portugal, Switzerland, and Turkey have a clearly declining level of intergenerational persistence (i.e., more mobility). Other countries show more stability in the overall persistence, for example, Britain, Italy, Poland, and Spain. In Bulgaria we see rising intergenerational persistence, largely through increasing direct persistence. Overall, we see the sharpest decline in the direct OD association in most, but not all, countries. It is the variation in the two components of intergenerational persistence across countries and cohorts that is examined in the following analyses.

Contextual Factors and Intergenerational Persistence

The analysis proceeds by examining the associations between contextual variables and the direct and indirect (i.e., through education) components in intergenerational persistence of occupational status. This analysis reports the results of models summarized by Equations 3 and 4. For ease of interpretation, all contextual variables were *z*-standardized for this analysis. Figure 5 shows the results of separate country fixed-effects models for each of the moderator/contextual variables. The interpretation of coefficients is how much of the intergenerational persistence components change with one standard deviation increase in the contextual variable (holding constant for overall country-level differences in persistence components). So, for example, given that the average indirect path is 0.14 (Table 3), an effect size of –0.01 indicates about a 7 percent reduction of the intergenerational between-education persistence of occupational status, if the contextual variable rises with one standard deviation.

Figure 5 shows that educational expansion is associated with declining levels of intergenerational persistence. Both the indirect path and the direct path of intergenerational persistence are lower if participation in higher-education and secondary-education rises in a society. For the indirect path, this implies that education gets more equally distributed across socioeconomic backgrounds, or the returns to education go down. For the direct path, this finding implies that the direct association between origin status and destination

Table 3. Description of the Country-Cohort Dataset

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Birth cohort	297	6.461	2.515	0	11
All Countries					
Total intergenerational persistence	297	.291	.083	.050	.619
Indirect path of intergenerational persistence	297	.136	.048	.032	.273
Direct path of intergenerational persistence	297	.155	.073	−.020	.492
OECD Countries					
Total intergenerational persistence	238	.296	.084	.050	.619
Indirect path of intergenerational persistence	238	.135	.044	.032	.253
Direct path of intergenerational persistence	238	.161	.076	−.020	.492
Europe					
Total intergenerational persistence	235	.289	.082	.050	.619
Indirect path of intergenerational persistence	235	.137	.046	.048	.273
Direct path of intergenerational persistence	235	.152	.074	−.020	.492
Origin education slope	297	2.712	.982	.493	8.405
Average destination rank by education	297	.516	.028	.393	.648
Proportion above lower-secondary (microdata)	297	.676	.192	.109	.964
Proportion with tertiary degree (microdata)	297	.253	.130	.033	.677
Secondary-school participation per 10 capita (CNTS)	218	5.058	2.797	.703	11.883
University participation per 10 capita (CNTS)	219	1.140	.811	.000	4.339
Minimum school-leaving age	180	14.552	1.592	10	18
Tracking age	173	13.218	1.960	10	16

Source: Country-cohort database.

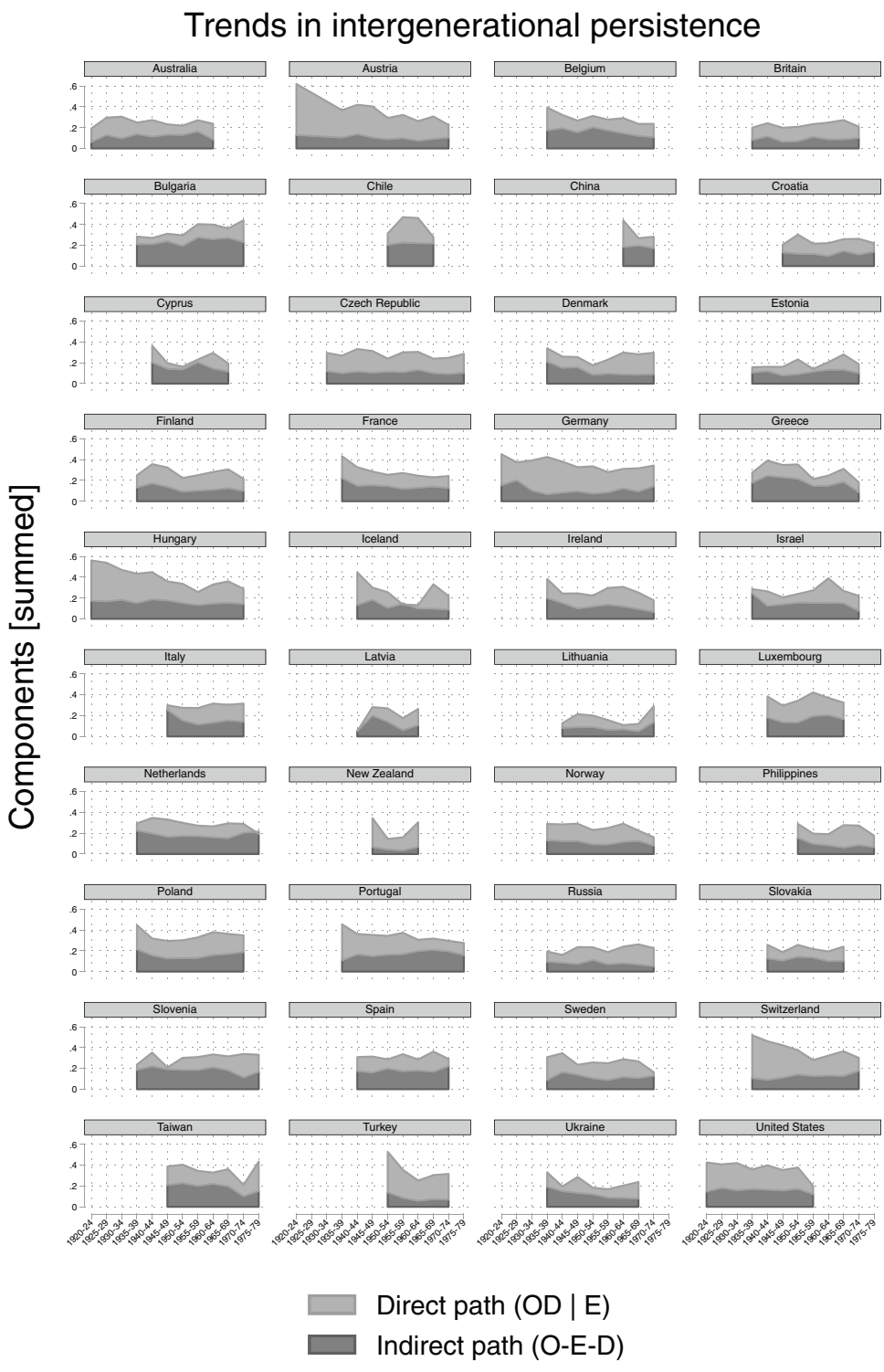

Figure 4. Trends in Direct and Indirect Paths of Intergenerational Persistence
Note: This figure shows trends in the total Origin-Destination relationship decomposed into indirect (O-E-D) and direct (OD | E) paths, by country.

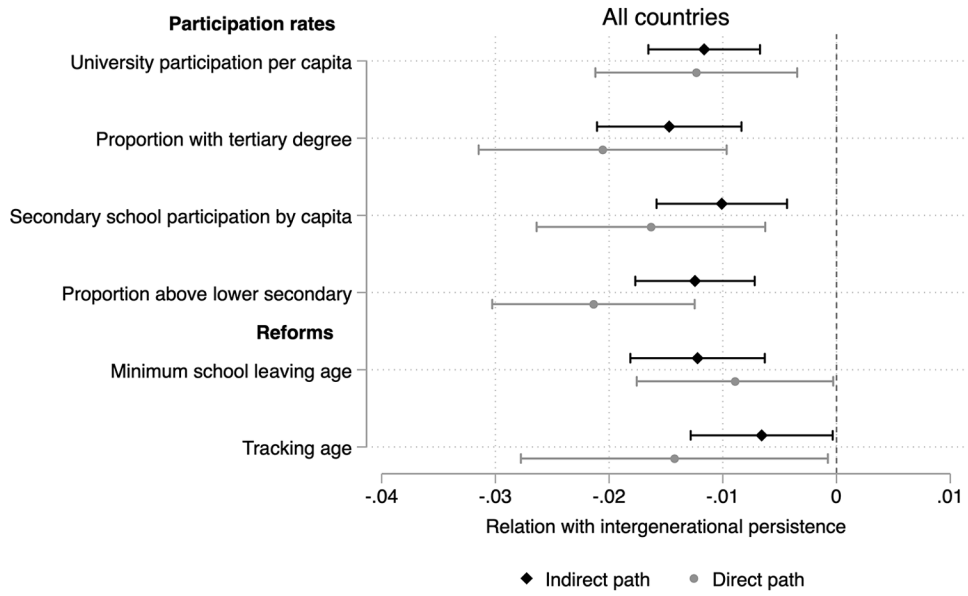

Figure 5. Associations between Educational Expansion and Policies and Components of Intergenerational Persistence of Occupational Status
Note: Separate models for each moderator. 95 percent CIs displayed. Country fixed-effects models. This figure shows the results of the main model, in which the strengths of the indirect path (O-E-D) and the direct path (OD | E) are modeled as a function of educational participation rates and policies that promote expansion (minimum school-leaving age and tracking age).

status declines if education expands. In terms of effect sizes, for every standard deviation increase in educational participation rates, the total intergenerational persistence, being the sum of the direct and indirect paths, reduces by approximately 0.02 to above 0.03. This equals around 10 percent of the average intergenerational persistence level.

Looking at the educational reform variables, we see that minimum school-leaving age has the anticipated association. The longer a cohort goes to school as a minimum standard, the weaker the association between origin and destination status. Here too, the pattern is such that both the indirect path through education and the direct OD association are reduced with rising minimum school-leaving ages. I also find that the direct component is reduced with longer compulsory schooling, indicating the intergenerational persistence is lower if students attend school longer. A later tracking age is also associated with reduced intergenerational persistence, for both the direct OD link and the indirect path through education.

ROBUSTNESS CHECKS

Appendix Table A2 shows a number of robustness checks. I replicated models on more developed economies, by examining only member countries of the Organization for Economic Cooperation and Development (OECD), and then only European countries.

I also separately estimated the models for men and women, including the gender-specific calculation of the origin and destination rank scores, and underlying mobility parameters. Given that we have similar sample restrictions (minimum 20 observations in every education category for each country-cohort), the number of available

country-cohorts decreases (N = 204 for women and N = 229 for men). The overall pattern is most clearly replicated among men; both the direct and indirect components of intergenerational persistence are declining with more educational expansion. For women, the associations between educational expansion and the indirect paths are closer to zero, indicating that the indirect O-E-D path is not weakening with more expansion. The direct OD persistence declines with more expansion, somewhat more so than for men.

I also estimated models on absolute ISEI scores of parents and children, rather than the proportional scores, similar to recent mobility studies (Hout 2018), and I estimated mixed models, complemented with a fixed and random slope of cohort. Then, to summarize the overall predictive effect of educational expansion, I estimated a structural equation model using a latent educational expansion variable and the four expansion variables as manifest variables, again with cohort effects, and this time including the educational reform variables as controls. Then, I performed two robustness checks using a different approach to weighting.

The general pattern in the robustness checks is similar to the results in Figure 5: more expansion is associated with weaker intergenerational persistence, both directly and indirectly, through education. Only the mixed model with cohort effects shows the direct path is less strongly associated with expansion, and in one case even positively. The structural equation model that includes a slope for cohort shows the direct OD persistence is not associated with educational expansion. Still, we see little evidence that direct OD persistence goes up with more expansion, as would be assumed by the direct persistence theory. The indirect path gets weaker, implying more social mobility through education, and this trend is not compensated with a strengthening of the direct OD association.

ADDITIONAL ANALYSES

The Appendix reports some additional analyses. First, nonlinearities are estimated between expansion and the mobility parameters. Only the direct OD path shows a curvilinear relationship with expansion (Appendix Figure A2): at higher levels of expansion there is a less steep decline of the OD path. Nevertheless, the negative association never becomes positive, implying that even extremely high educational participation rates are not associated with compensatory processes.

Second, I explicitly addressed the compositional argument that changing participation rates affect the direct OD path. Manipulating the π_e-parameters of Equation 2, which indicate the sizes of the education groups, we can see what happens to the direct OD path if only participation rates change, but not the covariances between Origin, Education, and Destination. Simulating two scenarios, more expansion than factually observed, and less expansion than observed, the results show that, overall, expansion seems to have affected mobility more through the changing covariances between the mobility variables than through changing proportions going into higher levels of education (Appendix Figure A3).

Third, I follow earlier studies that use instrumental variable models with education policies as instruments of educational distributions at the country-cohort level (Checchi and Van de Werfhorst 2018), using the minimum school-leaving age as an instrument. These models, shown in Appendix Table A3, are estimated to show *contextual-level* causal effects of educational expansion on the country-cohort-level association between origin, education, and destination, not the causal effects of expansion on the size of the *individual* causal effect of education, to the extent that the role of education is differentially affected by omitted individual variables over time (such as ability) (Zhou 2019). The instrument is predictive of educational expansion in the expected direction: a higher minimum school-leaving age is predictive of higher rates of participation in secondary and tertiary education. With some, but not all, of the expansion variables, it appears that the direct OD association goes down with expansion.

Fourth, again following the IV approach, I estimated the effect of educational expansion on the separate OE and ED slopes, using a modeling approach similar to Bloome and colleagues (2018) rather than mathematical decomposition. Appendix Table A4 shows the OE slope consistently goes down with expansion, and also the average occupational rank per educational category declines.

CONCLUSIONS AND DISCUSSION

Using an innovative combination of a comparative perspective and statistical decomposition techniques, this study contributes to the debate on the role of education for social mobility. More specifically, it addressed the question of whether educational expansion improves social mobility, by decreasing the intergenerational persistence of occupational status. The estimated average intergenerational persistence of occupational status over 40 countries and birth cohorts from 1920 to 1979 was similar to published estimates of the average rank-rank occupational status persistence across many cohorts in the United States (Song et al. 2020), slightly higher than rank-rank income persistence in Norway (Markussen and Røed 2020), lower than rank-rank occupational status persistence in most cohorts in China (Xie et al. 2022), and similar to the average rank-rank income persistence in a comparison of the United States, the United Kingdom, and Sweden (Gregg et al. 2017). Yet, intergenerational persistence is a function of educational expansion.

Sociological scholarship is not in agreement on the role of expansion. First, educational inequality can be maintained when the advantaged classes monopolize the educational system, as a classical Bourdieusian argument would hold (Bourdieu 1998). Expansion of education can then coincide with a maintenance of inequality. Educational inequality can be "maximally maintained" when inequality would only go down if the advantaged classes have saturated their participation at a certain level (Raftery and Hout 1993). Even if education gets more equally distributed across students coming from different socioeconomic backgrounds, elites find pathways within levels of attainment to "effectively maintain" their advantage (Lucas 2001). Moreover, resourceful families can also help their offspring outside education, for instance, by using their resources or transmitting their genes.

Empirically, the evidence on the role of expansion for educational inequality and social mobility is mixed. Some studies find no declining (or sometimes even rising) educational inequalities with expansion (Bar Haim and Shavit 2013; Härkönen and Sirniö 2020), others find declining educational inequalities (Ballarino et al. 2009; Blanden and Macmillan 2016; Breen et al. 2009; Katrňák and Hubatková 2022). Similar discrepancies exist regarding occupational mobility, with some studies finding rising mobility rates with expansion (Breen 2010; Pfeffer and Hertel 2015), and others refuting the hypothesis that educational expansion reduces intergenerational persistence of socioeconomic advantage (Knigge et al. 2014; Pöyliö et al. 2018). It would be relevant to know under which conditions studies find support for the educational expansion effects on social mobility, while others do not.

Possible avenues for further research could be related to the particular historical phase that is studied, whether studies rely on comparative or single-country data, or whether a linear or categorical approach of social mobility is used (although the above-mentioned studies do not clearly diverge on the issue based on this choice). The importance of the historical period is demonstrated in a recent paper on Denmark, which showed that compulsory schooling laws increased intergenerational educational mobility for cohorts born until the 1960s, but further expansion of higher-education since the 1970s cohorts no longer improved educational mobility (Karlson and Landersø 2024).

Given that the current study uses a very large dataset covering many different countries and time periods in terms of educational

expansion—variation that is needed to empirically study the relation between expansion and social mobility—I was able to disentangle three broad arguments presented in the literature and put them to empirical test. To elucidate this debate, it is necessary to statistically decompose the intergenerational mobility process in an indirect path from Origin through Education to Destination, and a direct OD path, and to do so for a large number of contexts that vary in educational participation rates.

In particular, one broad theory in the sociology of stratification is *contextual dependency theory*: "context matters." Educational expansion, and policies that promote expansion, improve educational opportunities and affect the school-to-work link, so that intergenerational mobility increases. A second theory is *ineffective context theory*, which, with some simplification, holds that "context does not matter." Developed economies have very similar patterns of social mobility, and with rising educational participation, inequality is maintained in education, and the value of education on the labor market does not change as long as the occupational structure upgrades correspondingly.

A third argument gets more sociologically interesting, and contends that families will find ways to keep their offspring ahead even if educational expansion would reduce inequalities through education. Expansion may reduce the intergenerational persistence *insofar as it goes through broad categories of educational attainment*, but may be linked to strengthening intergenerational persistence *within* education groups (i.e., a strengthening direct OD path). This can happen through more detailed pathways in education, but also outside the education system, by using parental resources to find more prestigious occupational positions. Or compensation within educational categories may happen through the transmission of genes, which may become more important in egalitarian systems (Engzell and Tropf 2019). If expansion "threatens" the maintenance of inequalities, such direct transmission processes will gain strength. A lot of social stratification research follows this line of reasoning, which I summarize as a *direct persistence theory*.

The results are mostly in line with the contextual dependency theory. With expansion, the origin-education association goes down, as does the average occupational rank that an educational level brings. Moreover, the direct association between parental occupational status and children's occupational status conditional on broad categories of education goes down with educational expansion. This latter finding is important because the direct persistence theory would predict that inequalities would be strengthened within broad levels of educational attainment. Such compensatory actions are apparently not so strong that they protect direct intergenerational persistence when education equalizes. This central finding holds when we study minimum school-leaving age policies and tracking age policies, suggesting that educational policies that promote expansion not only equalize education but also promote occupational status mobility. For minimum school-leaving age, this finding is at odds with some earlier studies. These studies concluded that compulsory schooling laws equalize educational opportunities, but are much more weakly related to "total" social mobility because resourceful families compensate for reduced opportunities to ensure advantage in the labor market (Pöyliö et al. 2018; Rauscher 2016; Sturgis and Buscha 2015).

These results address important facts for contemporary debates on the meritocracy. Proponents of meritocratic allocation procedures have been criticized as being insensitive to structural barriers to attainment. Such barriers certainly exist; inequalities in educational attainment are found across the board, and educational attainment strongly predicts labor market careers. Even a full meritocracy could still have intergenerational persistence of status, when merits are transmitted between generations. But the expansion of education did equalize opportunities. Equality of opportunity may be more damaged by anti-meritocratic tendencies that make it hard

for children of less advantaged families to do well in school than by meritocratic allocation. For instance, economic inequality is likely to reduce social mobility (Chetty et al. 2017; DiPrete 2020; Mitnik, Cumberworth, and Grusky 2016).

Of course, we could only consider cohorts that have fully entered the labor market, which restricts our analysis to birth cohorts until 1980. These were the cohorts that experienced expansion, and it is possible the equalization of opportunities stalled after that because expansion halted. Indeed, we found nonlinearities in the direct persistence, suggesting that the direct OD association no longer goes down after a rather high level of expansion has been reached. Nevertheless, even if rising downward absolute mobility is a recent phenomenon that needs further study, first studies on this matter suggest that patterns of social fluidity (i.e., relative mobility) are not so different from before (Nennstiel 2021; Thijssen and Wolbers 2016).

Another caveat of our study is that while it captures a broad set of occupational statuses, the extremes of the socioeconomic distribution are not well-studied with the comparative data at hand. Relatedly, we do not know how the patterns would change if we used data on income rather than occupational status. Nevertheless, as the overall intergenerational persistence is rather similar between occupational status and income, and given that occupational status is still a valuable indicator of social advantage, the current findings do give more support for the modernist agenda of educational expansion and meritocratization than contemporary critics of the meritocracy would have it. Similar to Goldin and Katz (2009), who claim that a lack of educational expansion in recent decades has magnified economic inequalities, I would argue that a focus on expansion may promote further social mobility. A common concern is that educational participation cannot grow unlimitedly. While this is naturally true, one may learn from the massive efforts in the 1930s United States to get everybody to a high school diploma. Contemporary critics likely had similar concerns that "high school for all" was a bit too ambitious for the talents available in society.

APPENDIX

Table A1. Correlation Matrix of Variables in the Country-Cohort Database

		1	2	3	4	5	6	7	8	9	10	11	12
1. Birth cohort	r	1											
2. Total intergenerational persistence	r	−.30	1.00										
	p	.00											
3. Indirect path of persistence	r	−.14	.47	1.00									
	p	.02	.00										
4. Direct OD persistence	r	−.25	.82	−.11	1.00								
	p	.00	.00	.05									
5. Average destination rank by education	r	.09	−.03	.14	−.13	1.00							
	p	.12	.55	.02	.02								
6. Origin education slope	r	−.25	.65	.67	.29	.08	1.00						
	p	.00	.00	.00	.00	.17							
7. Proportion above lower-secondary (microdata)	r	.55	−.40	−.26	−.28	−.01	−.32	1.00					
	p	.00	.00	.00	.00	.85	.00						
8. Proportion with tertiary degree (microdata)	r	.48	−.45	−.29	−.32	−.28	−.41	.67	1.00				
	p	.00	.00	.00	.00	.00	.00	.00					
9. Secondary-school participation per 10 capita (CNTS)	r	.65	−.43	−.30	−.28	−.17	−.43	.51	.64	1.00			
	p	.00	.00	.00	.00	.01	.00	.00	.00				
10. University participation per 10 capita (CNTS)	r	.67	−.30	−.22	−.19	−.21	−.24	.62	.59	.71	1.00		
	p	.00	.00	.00	.01	.00	.00	.00	.00	.00			
11. Minimum school-leaving age	r	.50	−.29	−.36	−.10	−.12	−.35	.61	.43	.33	.56	1.00	
	p	.00	.00	.00	.18	.12	.00	.00	.00	.00	.00		
12. Tracking age	r	.42	−.43	−.11	−.40	−.09	−.29	.52	.42	.39	.44	.35	1.00
	p	.00	.00	.17	.00	.25	.00	.00	.00	.00	.00	.00	

Source: Country-cohort database.
Note: r = correlation coefficient; p = *p*-value.

Table A2. Robustness Checks of Intergenerational Persistence

	Basic Model (a)				Only OECD (b)				Only Europe (b)				Only Men (c)				Only Women (c)			
	Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path	
	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se
Participation rates																				
University participation per capita	−.012	.003	−.012	.005	−.010	.003	−.016	.005	−.010	.003	−.014	.005	−.013	.003	−.006	.005	−.005	.003	−.009	.005
Proportion with tertiary degree	−.015	.003	−.021	.006	−.011	.004	−.028	.006	−.013	.004	−.022	.006	−.012	.005	−.015	.008	−.006	.004	−.024	.006
Secondary-school participation per capita	−.010	.003	−.016	.005	−.009	.003	−.021	.006	−.009	.003	−.019	.006	−.013	.004	−.010	.006	−.004	.004	−.014	.007
Proportion above lower-secondary	−.012	.003	−.021	.005	−.011	.003	−.026	.005	−.011	.003	−.023	.005	−.012	.004	−.012	.006	−.005	.003	−.020	.005
Reforms																				
Minimum school-leaving age	−.012	.003	−.009	.004	−.012	.003	−.009	.005	−.012	.003	−.009	.005	−.011	.004	.000	.006	−.008	.003	−.014	.006
Tracking age	−.007	.003	−.014	.007	−.007	.003	−.014	.007	−.007	.003	−.014	.007	−.015	.005	.003	.006	−.001	.004	−.014	.007

	Absolute ISEI (d)				Mixed-Model with Cohort Random Effects (e)				Structural Equation Model with Cohort Effects (f)				No Individual Weights (g)				Individual Weights Based on Missings in Total Original Samples (h)			
	Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path		Indirect Path		Direct Path	
	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se
Participation rates																				
University participation per capita	−.017	.003	−.011	.005	−.015	.005	.016	.008					−.010	.003	−.015	.005	−.013	.003	−.015	.005
Proportion with tertiary degree	−.024	.004	−.015	.006	−.013	.005	−.012	.007					−.013	.004	−.022	.006	−.015	.004	−.026	.007
Secondary-school participation per capita	−.016	.004	−.012	.006	−.005	.005	.000	.008					−.009	.003	−.020	.006	−.010	.004	−.024	.007
Proportion above lower-secondary	−.021	.003	−.017	.005	−.013	.005	−.015	.007					−.011	.003	−.023	.005	−.011	.003	−.025	.005
Educational expansion index									−.261	.107	−.161	.118								
Reforms	−.017	.003	−.007	.005																
Minimum school-leaving age	−.015	.004	−.011	.007	−.013	.004	.009	.007	−.004	.003	.012	.005	−.012	.003	−.010	.005	−.014	.003	−.009	.005
Tracking age					.001	.004	.002	.008	.001	.005	−.001	.006	−.007	.003	−.015	.007	−.007	.003	−.017	.007
Birth cohort									.006	.005	−.009	.004								

Note: All models use standardized predictor variables on the country-cohort dataset, and use weights for the imprecision of the underlying microlevel estimates, and the varying representativeness by education category.
(a) As in Figure 5.
(b) OECD member states only, and European countries only (see Table 2 for list of countries).
(c) Models by gender calculate O and D and mobility parameters by gender.
(d) The underlying OED models are estimated with absolute ISEI score for origin and destination status.
(e) To assess the relevance of cohort, a mixed model is estimated with country-cohorts nested in cohorts, with a random effect of birth cohort across countries.
(f) Structural equations model with four expansion measures as manifest variables, and educational expansion as a latent variable. Reform variables are entered in the same model. The model adds a slope for birth cohort, and covariance between expansion on the one hand, and cohort, tracking age, and minimum school-leaving age on the other. Clustered standard errors at country level.
(g) Unweighted for individual weights.
(h) Using individual weights based on partial nonresponse in estimation sample relative to total sample in the individual-level data, by country-cohort.

Table A3. Instrumental Variables Regression of Intergenerational Persistence on Educational Participation Rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Proportion above Lower-Secondary Education			Secondary-School Participation per 10 Capita			Proportion with Tertiary Degree			University Participation per 10 Capita		
	1st Stage	2nd Stage Indirect Path	2nd Stage Direct OD Path	1st Stage	2nd Stage Indirect Path	2nd Stage Direct OD Path	1st Stage	2nd Stage Indirect Path	2nd Stage Direct OD Path	1st Stage	2nd Stage Indirect Path	2nd Stage Direct OD Path
Minimum school-leaving age	.077***			1.120***			.040***			.389***		
	(.007)			(.130)			(.003)			(.033)		
Proportion above lower-secondary education		−.100***	−.073*									
		(.021)	(.034)									
Secondary-school participation per 10 capita					−.007***	−.003						
					(.002)	(.003)						
Proportion with tertiary degree								−.192***	−.140*			
								(.040)	(.067)			
University participation per 10 capita											−.020***	−.010
											(.005)	(.008)
Constant	−.440***	.168***	.296***	−13.175***	.122***	.255***	−.483***	.119***	.260***	−4.743***	.119***	.253***
	(.108)	(.017)	(.028)	(2.018)	(.011)	(.018)	(.053)	(.010)	(.017)	(.519)	(.010)	(.018)
Observations	180	180	180	132	132	132	180	180	180	132	132	132
N Countries	22	22	22	19	19	19	22	22	22	19	19	19
F-test (df = 1)	124.53***			74.06***			140.41***			135.36***		
Durban-Watson Endogeneity test (df = 1)		6.291*	2.239		5.043*	.287		6.956**	.306		.903	.966
R-squared		.574	.550		.564	.439		.570	.532		.612	.436

Note: The instrumental variables model estimates, as the first stage, the level of educational participation PART in country-cohort *jk* as a function of the instrument (minimum school-leaving age), adding country fixed effects ζ_j, with the equation $PART_{jk} = \alpha + \gamma C_{jk} + \zeta_j + \varepsilon_{jk}$. In the second stage, the intergenerational persistence (between and within separately), is modeled as a function of the predicted level of educational participation from the first stage, modeled with the equation $\beta_{jk}^{b,k} = \alpha + \gamma \widehat{PART_{jk}} + \zeta_j + \varepsilon_{jk}^{b,k}$. Minimum school-leaving age is available for 22 countries. The F-tests confirm the instrument is relevant. The effect of educational expansion (second stage) is consistently negative on the indirect path of intergenerational persistence. On the direct OD link the results differ between educational participation variables taken from the microdata and from the CNTS database. Similar to descriptive results of Figure 5, the direct component also declines with more expansion if participation measures are used from the microdata. If we resort to the CNTS participation statistics, there is no longer an effect of expansion on the direct OD association. Note that the Durbin-Hausman endogeneity test is not significant for these within-models, suggesting the educational participation variables can be treated as exogenous (in which case the results of Figure 5 may be preferred). Standard errors are in parentheses. Models include country fixed effects.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed).

Table A4. A Model-Based Approach to the OE and ED Associations

	Proportion above Lower-Secondary Education				Secondary-School Participation per 10 Capita				Proportion with Tertiary Degree				University Participation per 10 Capita			
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	Average Destination Rank by Education Group		Origin-Education Slope		Average Destination Rank by Education Group		Origin-Education Slope		Average Destination Rank by Education Group		Origin-Education Slope		Average Destination Rank by Education Group		Origin-Education Slope	
Minimum school-leaving age	.078*** (.007)		.073*** (.007)		1.130*** (.130)		1.085*** (.128)		.041*** (.003)		.039*** (.004)		.391*** (.033)		.385*** (.033)	
Proportion above lower-secondary education		−.023* (.011)		−2.387** (.485)												
Secondary-school participation per 10 capita						−.002* (.001)		−.114** (.035)								
Proportion with tertiary degree										−.045* (.020)		−4.487*** (.937)				
University participation per 10 capita														−.007* (.003)		−.321** (.100)
Constant	−.462*** (.110)	.555*** (.009)	−.386** (.112)	4.661*** (.405)	−13.291*** (2.020)	.549*** (.006)	−12.660*** (2.027)	3.489*** (.249)	−.490*** (.053)	.543*** (.005)	−.468*** (.057)	3.484*** (.253)	−4.759*** (.520)	.548*** (.006)	−4.683*** (.522)	3.428*** (.242)
Observations	180	180	180	180	132	132	132	132	180	180	180	180	132	132	132	132
N Countries	22	22	22	22	19	19	19	19	22	22	22	22	19	19	19	19
F-test (df = 1)	125.98***		110.17***		75.31***		71.84***		143.77***		122.14***		136.12***		136.33***	
Endogeneity test Chi-square (df = 1)		9.656**		3.201		5.477*		.594		.14		5.176*		.277		.184
R-squared		.643		.487		.644		.574		.687		.459		.682		.570

Note: The OE association is estimated by a stereotype logit model on the three-category education variable, yielding a logit coefficient that indicates the odds to move up one level rather than stay below, across the range of the origin rank score (that ranges from theoretical values 0 to 1). The stereotype logit model relaxes the proportional odds assumption often plaguing ordinal logit models. The ED association is modeled by examining the average destination rank by education category, controlling for social origin status. Using a centered origin variable, the model predicts destination rank by origin rank, for each education group separately. The intercepts of these models inform us of the average destination rank by education group, for each country-cohort separately. Standard errors are in parentheses. Models include country fixed effects. There are slight differences in the first-stage results due to different weights used.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed).

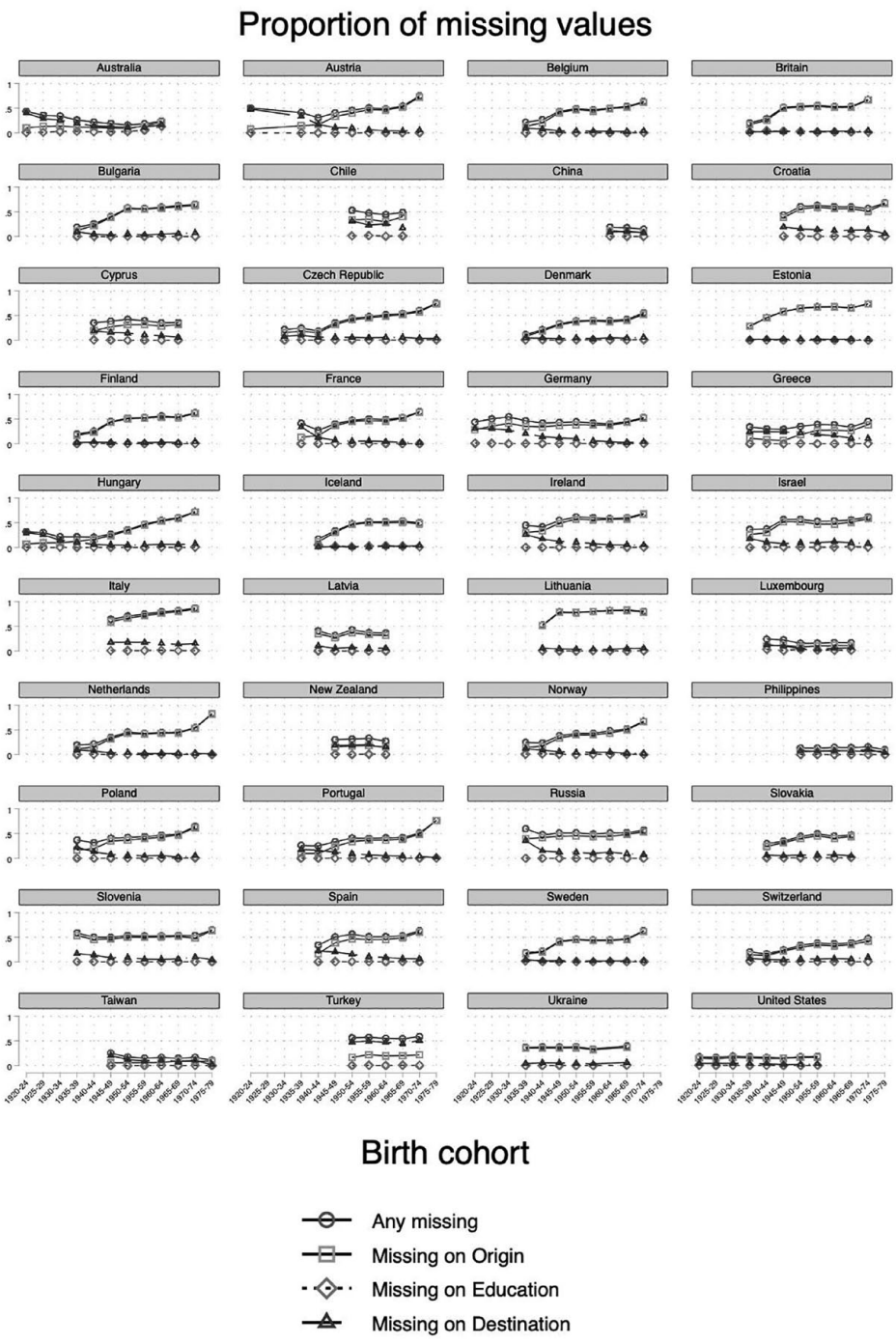

Figure A1. Missing Values by Country-Cohort
Note: Proportion missing values of total pool of respondents, by country-cohort.

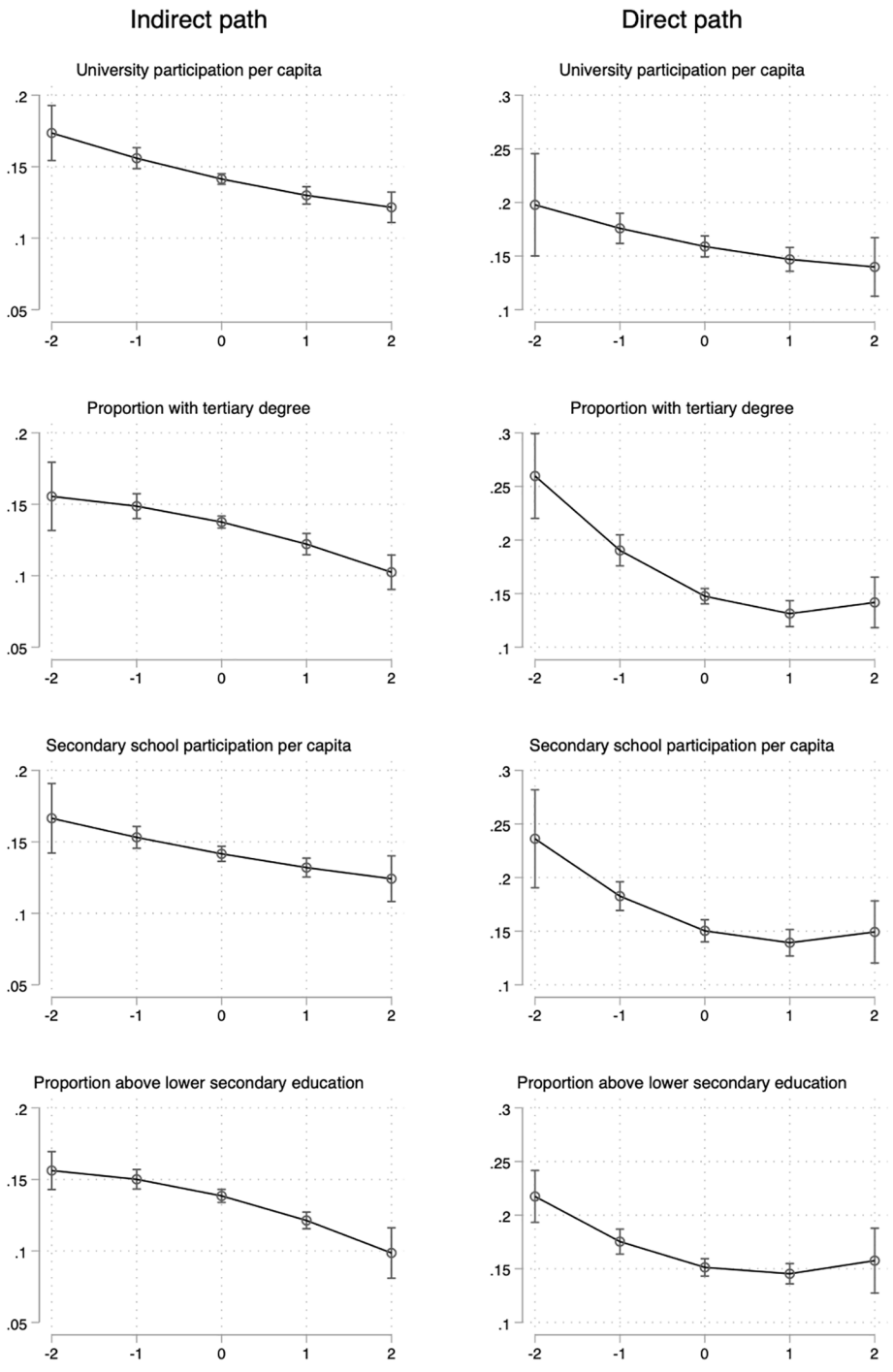

Figure A2. Nonlinear Patterns in the Association between Educational Expansion and Intergenerational Persistence

Note: Curvilinear slopes were estimated for the models with the educational participation rates. Models include country fixed effects. F-tests showed the direct path is better estimated as a curvilinear pattern (except for the association with university participation per capita). For the indirect path, the linear model is preferred. The figure shows results of the curvilinear patterns.

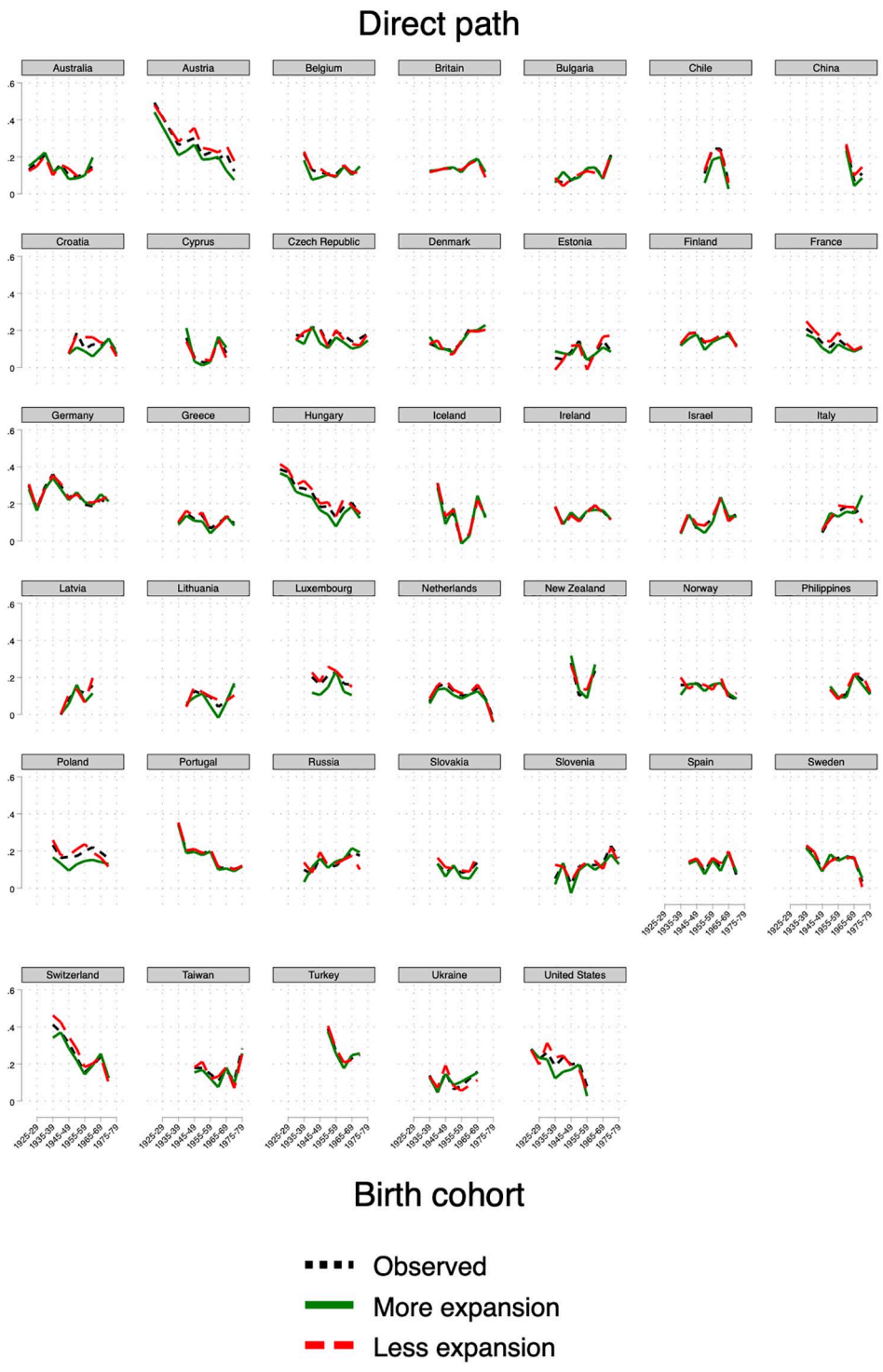

Figure A3. The Direct Path of Origin to Education under Different Simulated Educational Distributions

Note: The "more expansion" scenario half the size of the middle education category is moved to the highest level, keeping the relative sizes of the lowest two categories the same. The "less expansion" scenario brings half the size of the middle education category to the lowest category, and keeps the remainder in the same relative distribution between the middle and the higher category.

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Data Note

Replication code for this study is available on the Open Science Framework at https://osf.io/8br39/.

Notes

1. We cannot rule out that the limited opportunities for parents of college-educated children to move their children ahead is because the labor market position of children cannot endlessly grow. Education partly functions as a positional good in labor markets, and individuals with a college degree will be allocated to less-advantaged labor market positions accordingly (Di Stasio, Bol, and Van de Werfhorst 2016; Wiedner 2024).
2. To be sure, the Maximally Maintained Inequality hypothesis is more elaborate than that, and states that inequality can decline when elites have "saturated" their attainment at a particular educational level. I cannot go into this hypothesis here for reasons of space.
3. Obviously the trend in the returns to education depends not only on educational expansion, but also on the structural change in the labor market. But given that we measure the labor market outcomes (D) in a rank score by country-cohort, structural change is neutralized. Expansion, then, may reduce ED in terms of the average rank score an educational level attains.
4. The DEVO project, led by Ganzeboom, coded father's and mother's occupations for rounds 1 to 5 of the European Social Survey (see http://www.harryganzeboom.nl/ESS-DEVO/index.htm). For ESS round 6 (seven countries) and round 7 (two countries), national teams coded father's and mother's occupations; this was disseminated in the national files through http://www.europeansocialsurvey.org. These files are currently available upon request from the ESS support team.
5. ISSP rounds with information on parents' and children's occupational codes are 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1997, 1999, 2009, and 2019.
6. With this age limit, the models thus assume that occupational status careers are rather stable after the age of 35, and that selective mortality till the age of 70 does not harm the quality of our data.
7. In the ISSP data, parental occupation was mostly only asked for the father. The ESS asked occupations of both parents. I used father's occupation in this study. If the highest of either parent is taken as the origin's occupational status for ESS, and father's occupational status for ISSP, the results are strongly in line with the current findings.
8. See http://www.harryganzeboom.nl/ISMF/index.htm.
9. The external expansion data were merged to when the respondent was 15 years old to reflect the educational distribution a respondent was facing when deciding to continue schooling. The expansion data from the microdata reflect the participation rates of the cohorts themselves, as this would be another way to consider the relationship between expansion and social mobility. The participation rate at secondary school per 10 capita can be larger than 10 because the absolute participation rates are divided by the size of the age group that is typically enrolled in this level. If participation rates are larger than 10, the total size of the student population exceeds that of the respective cohort, which can happen when other age groups participate at this level (Banks and Wilson 2022).
10. Seemingly unrelated estimation assumes the same range and marginal distribution of the dependent variables. I also estimated separate models and found similar results as the ones presented here.
11. It is not self-evident that controlling for general trends across cohorts is a wise decision. Including a cohort trend may open up a collider path with cohort-related omitted variables that are a consequence of both educational expansion and social mobility. One could, for instance, think of general prosperity, or other measures of modernization. The problem will not be solved by using lagged variables, as there will be autocorrelation of such modernization variables over time. However, given that most mobility studies control for time trends, and methodological research shows that controlling for confounders may be more important than the risk resulting from introducing colliders (Ding and Miratrix 2015), I show these results as robustness checks.

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