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School tracking and its role in social reproduction: reinforcing educational inheritance and the direct effects of social origin[1]

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Abstract

The degree of social reproduction varies considerably between industrialized countries, raising the question of which institutional regulations promote or restrict this process. Education is considered the main mediator of social reproduction. Because school tracking – the sorting of children according to ability and interest at different ages – is known to affect educational attainment and the degree of tracking varies strongly across countries, it may thus account for differences in social reproduction. However, empirical studies are scarce, and the total impact of tracking on social reproduction remains ambiguous. Using the European Social Survey (ESS) 2012 and 2014 from 24 countries, we demonstrate that school tracking is strongly associated with higher degrees of social reproduction. Decomposing the process of social reproduction into educational inheritance, educational returns and direct effects of social origin, we find that although all channels contribute to social reproduction, the impact of tracking seems to be exerted through educational inheritance and to a similar degree through direct effects of social origin, whereas educational returns do not seem to be affected. Even net of educational attainment, social origin thus has a stronger effect on social status in tracked systems. We ascribe this effect to differences in qualitative choices within educational tracks, such as fields of study.

Keywords: Social reproduction; school tracking; direct effects of social origin; educational inheritance; ESS; Europe

Introduction

Educational attainment, social status, income and prestige are consistently distributed unequally across many countries (Breen and Jonsson 2005; Shavit and Blossfeld 1993). Thus, social stratification is considered an inherent feature of

modern societies. Nevertheless, social stratification can become problematic, especially when opportunities for intergenerational status mobility are scarce: people are less likely to accept inequality if their belief in future mobility is lower (e.g., Osberg and Smeeding 2006). Moreover, individual potential is not fully exploited if status relies heavily on parental background and less on ability. Although research has found that parental education and status have substantive effects on the next generation's status (e.g., Breen 2004; Dubow, Boxer and Huesmann, 2009; Hout 1988), the degree of such social reproduction varies substantially among countries (Breen and Jonsson 2005; Erikson and Goldthorpe 1992). These differences raise the question of which institutional regulations promote or restrict social reproduction and what the reasons are for these differences.

Educational attainment is considered a strong determinant of an individual's social status and thus a central element in the process of social reproduction (Blau and Duncan 1967; Bol and van de Werfhorst 2016; Dubow, Boxer and Huesmann, 2009; Müller and Karle 1993; Shavit and Müller 1998; Treiman 1970). Therefore, schools are considered one of the main institutions that affect status inequality (Domina, Penner and Penner 2017). Variation in educational systems between countries is well documented (e.g., Blossfeld et al. 2016), and it may help explain cross-national differences in social reproduction. One of the most diverse and most discussed aspects of educational systems is the degree of *school tracking* (e.g., Allmendinger 1989; Bol and van de Werfhorst 2016; Kerckhoff 2001), the sorting of children according to ability and interest at different ages. The degree of tracking varies considerably even between industrialized countries. Germany, for example, broadly offers as many as four different school tracks and assigns children to these tracks around an age of 10, whereas in Great Britain – with some exceptions – the age of first selection generally is around 16 after attendance of a comprehensive school.

Despite its potential significance, there has been little research on the influence of tracking on social reproduction, which remains ambiguous. Some studies have shown that tracking increases educational inheritance (e.g., Pfeffer 2008; van de Werfhorst and Mijs 2010) and amplifies the importance of educational degrees in the labour market (e.g., Allmendinger 1989), suggesting that social reproduction is stronger in tracked systems. On the other hand, credentialist and signalling theories predict a smaller direct influence of parental background in tracked systems because school degrees carry more information in these systems (e.g., Bol and van de Werfhorst 2011; Jacob, Klein and Iannelli 2015; Mastekaasa 2011), which would speak against increased social reproduction. Still, critics may point out that choices of fields of study or vocational tracks – which are likely affected by parental decisions – are more important in tracked systems (Jacob, Klein and Iannelli 2015).

In this paper, we address the question of how tracking affects social reproduction and assess how tracking in general, age of first selection, number of tracks

at age 15 and proportion of differentiated curricula, in particular, affect the processes of educational inheritance, educational returns and the direct (net) effects of social origin.[2] We draw on the European Social Survey (ESS, rounds 6 and 7), which offers data regarding more than 20 European countries and enrich the data with country-specific measures of tracking (see Bol and van de Werfhorst 2016). In a first step, we calculate country-specific linear regressions and assess the effects of parental education on occupational status. We then decompose this effect to analyse how parental education affects educational attainment, how educational attainment translates to occupational status and how parental education, net of respondents' education, affects status. Finally, we test the degree to which these processes vary depending on the country-specific degree of school tracking and further unpack how the single characteristics of school tracking affect social reproduction in general and educational inheritance, educational returns and direct effects of social origin, in particular.

We therefore offer a 'look under the hood' of social reproduction and contribute to the explanation of why inequalities may be more persistent in some countries than in others. This is an especially important task since persistent attempts to adjust educational systems require a more detailed understanding of intended and unintended consequences. In the United Kingdom, for example, recent political attempts have been made to revoke reforms of the 1960s and 1970s that expanded a less-selective comprehensive school system and to allow for more selective schools to be created. Studies analysing differences between school types, however, came to the conclusion that grammar schools would not foster social mobility or benefit children from lower-class backgrounds. On the contrary, the recommendation was to phase out existing selective schools, indicating the importance of evaluating the impact of educational systems and their characteristics (see, for example, Burgess, Dickson and Macmillan, 2014; Boliver and Swift, 2011; Gorard and Siddiqui, 2018).

Education and school tracking as central elements of social reproduction

Most research on intergenerational status mobility and status reproduction stresses the importance of education as a mediator between social origin and destination (Blau and Duncan 1967; Breen 2010; Breen and Jonsson 2005; Ishida, Muller and Ridge 1995; Treiman 1970; Treiman and Yip 1989; Warren, Sheridan and Hauser 2002), leading to three channels through which social origin can affect social destinations: access to education, educational returns and direct effects of social origin (see Figure I).

School tracking, as one of the key elements of the educational system, has been shown to affect the relationships between social origin and education and between education and social destination (e.g., Allmendinger 1989; Pfeffer 2008). As we will show, from a theoretical point of view, school tracking,

Figure I: *Social reproduction: mediating effect of education and moderating effects of school tracking*
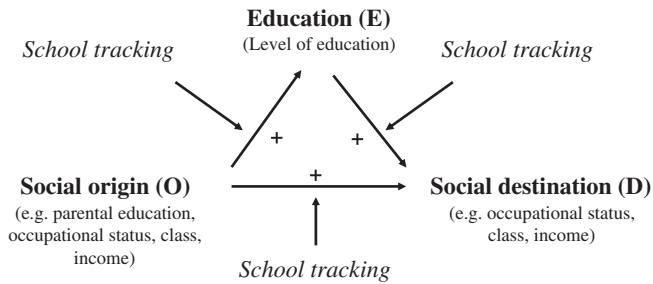
however, could affect all three relationships. As there are competing explanations for how tracking should affect the direct effect of social origin, the total effect of tracking on social reproduction remains ambiguous, requiring an empirical analysis of the impact of tracking on social reproduction in general and on all three channels to learn about the underlying mechanisms.[3]

Tracking – also known as educational stratification, ability grouping, sorting or differentiation – refers to the allocation of students into an educational environment that is more homogeneous in terms of the students' cognitive abilities (Bol et al. 2014; Marks 2006). Such an allocation can occur in multiple ways, for instance allocation to different schools, offering different curricula, assignment to different educational tracks (e.g., vocational and academic tracks), or assignment to different levels within the same school (e.g., comprehensive schools), and at different ages of children (Bol et al. 2014). Tracking mainly takes place during secondary schooling but may also occur post secondary education (Shavit et al. 2007).

The degrees of tracking vary internationally and, to a certain extent, within countries. Some countries track students into different schools by age 10, whereas others maintain a comprehensive secondary-school system (Hanushek and Wößmann 2006). When assessing the general country levels, at the higher end of tracking, the age of the first selection in Germany occurs around the age of 10. Typically, German students are tracked into different school types after completing elementary school. In contrast, the age of the first selection in the UK (with exceptions explained below) is 16, after graduating from secondary school. Comparing the number of tracks at age 15, Germany offers four different tracks ('Hauptschule', 'Realschule', 'Gymansium', and 'Gemeinschaftsschule'), whereas the UK generally offers one track (comprehensive school). In Germany, 69 per cent of the curriculum in primary and secondary education is tracked, whereas in the UK, only 15 per cent of the curriculum is tracked (see Online Appendix Table A1). The between-country differences in tracking may be complemented by countries offering exceptions from the predominant form of schooling (e.g., the United

Kingdom has 163 selective grammar schools that diverge from the majority non-selective comprehensive school system (Gorard and Siddiqui, 2018)). Moreover, countries with a more comprehensive school system may implement numerous subtler forms of student tracking (see, e.g., Blossfeld et al. 2016). In the UK and Germany alike, tracking may for example occur within comprehensive schools, in which students are sent to different classes based on not only subject interest but also level of qualification. Systems that track between educational programmes, instead of within programmes or schools, however, depict a stronger form of separating students based on their ability. Students are physically separated, and usually the full curriculum is tracked (Bol and van de Werfhorst 2016). Physically separating students may further increase inequality in attainment as students may be clustered due to characteristics such as poverty, immigration status or social background. This effect may even be reinforced by unequal access to schools due to housing prices (e.g., see Gorard 2016).

A general argument for tracking is that the curricula are tailored to the ability level of students, thus providing all students with the most efficient learning experience. An often-cited counterargument is that tracking creates homogenous classes and thus reduces positive spillover effects from stronger students (Zimmer 2003). More complex arguments refer to the impact of tracking on educational inheritance and educational returns (e.g., Allmendinger 1989; Parker, Jerrim, Schoon and Marsh 2016). As we will argue, tracking may also have an impact on social reproduction, depending on how direct effects of social origin are affected.

Tracking and educational inheritance

Early explanations for why *education* is inherited between parents and their children rest on the theory of cultural reproduction (e.g., Bourdieu 1973), which assumes that schools reward the class-specific habitus of upper-class children. One can also assume a more direct influence of parental education on children's education, through inheritance of cognitive ability (e.g., Marks 2014) or because highly educated parents are better equipped to help their children navigate educational careers (e.g., through assistance with schoolwork or education-relevant materials (Teachman 1987)). Parental education can also affect students' perceptions of the costs and risks of educational investments (e.g., Boudon 1974; Breen and Goldthorpe 1997; Breen, van de Werfhorst and Jaeger, 2014). However, empirical evidence yields mixed results (e.g., Becker 2003; Breen and Yaish 2006; Stocké 2007), suggesting that the mechanisms by which parental education affects children's education are complex and likely affected by a multitude of structural factors (Kerckhoff 1995).

How exactly should school tracking then affect this relationship between social origin and education? Notwithstanding the exact mechanisms underlying educational inheritance, several theoretical considerations suggest the effects of educational inheritance become stronger with higher degrees of school tracking. Schooling systems entail a variety of decisions involving parental advice, such as which courses to take, which level of schooling to choose (even within comprehensive schools) and which examinations to take (Lareau 1989). School tracking introduces more frequent (Kerckhoff 1993; Pfeffer 2008) and earlier decision making (Erikson and Jonsson 1996; McPherson and Willms 1987), thus increasing the influence of parents' strategic knowledge – which varies by parents' education and class. Thus, in systems that start tracking at an earlier age or in which a higher share of the curriculum is tracked, children from lower-class backgrounds are more likely to be assigned to a lower schooling track, giving them fewer opportunities to receive higher educational degrees.

One could argue that if tracking purely sorts students according to ability, children from all social backgrounds should eventually benefit from homogeneous groups. Indeed, it seems that tailored teaching methods in homogeneous groups are at least able to outweigh the negative impact of the lack of high-ability peers, suggesting that lower-ability students are at least not disadvantaged in tracked schooling systems (Duflo, Dupas and Kremer 2011; Zimmer 2003). However, there is evidence that tracking sorts not only according to ability but also according to social background (Marks 2006). Thus, children from lower social backgrounds should disproportionately be sent to lower tracks notwithstanding their ability, and school tracking should decrease these children's opportunities to earn higher educational degrees, thereby reinforcing educational inheritance. Whether the resulting educational inheritance translates to social reproduction depends on the degree to which educational credentials determine a person's status over the life-course.

Tracking and educational returns

Education is still known to be the single most important determinant of social position (Breen 2010; Müller and Shavit 1998). However, once individuals have obtained some type of educational degree, they still have incentives and opportunities for *intra*generational mobility. To secure their own family status, those who have not attained their parents' status are thus likely to seek upward mobility in their careers (Hillmert 2011). Opportunities for upward mobility are usually afforded through job and occupational changes.

How should school tracking affect this relationship between education and social position? From research on school-to-work transitions, we know that

highly tracked educational systems tend to award more occupation-specific credentials. With such occupation-specific credentials, access to occupations becomes more restricted, and credentials become more reliable signals for employers (Jacob, Klein and Iannelli 2015). Attending a certain school track thus limits the range of possible occupations one can enter after graduation and thus affects occupational status (Allmendinger 1989). It also becomes more costly to change jobs after graduation, and the likelihood of occupational changes and thus the chance for upward mobility over the life-course is reduced (Reichelt and Abraham 2017). In tracked systems, educational credentials are thus a stronger determinant of occupational status (Andersen and van de Werfhorst 2010; Bol and van de Werfhorst 2016; Kerckhoff 1995; Müller and Shavit 1998). Furthermore, selective processes (e.g., due to higher degrees of tracking) should equalize unobserved characteristics within educational groups and thus increase the explanatory power of educational degrees (Mare 1980; Jacob, Klein and Iannelli 2015).

As described earlier, children with lower social backgrounds should already be disproportionally assigned to lower tracks. Thus, school tracking may further reinforce social reproduction because of the greater deterministic power of educational credentials and reduced chances for occupational mobility.

Tracking and direct effects of social origin

Even though most research on social reproduction concentrates on the mediating role of education, more recent studies also focus on the direct effect of social origin on social destination, net of education (e.g., Bernardi and Ballarino 2016). The most common explanations for a direct effect of social origin lie in parental networks, favouritism, productivity (through non-cognitive skills that may become important after graduation), aspirations (Erikson and Jonsson 1998) or simply the inheritance of a family business (Bernardi and Ballarino 2016). Moreover, Jacob, Klein and Iannelli (2015) and Hällsten (2013) find that social origin affects occupational outcomes partly due to qualitative (or horizontal) differences in education, such as fields of study or different vocational tracks. Although providing the same level of education, these differences lead to occupations with different status and income (see also Triventi 2013; Reimer and Pollack 2010; van de Werfhorst, Sullivan and Cheung 2003). Accordingly, Lucas (2001) emphasizes that educational systems may reproduce within-group differences, for example through the type of institution. He argues that if qualitative differences are common, the socioeconomically advantaged will obtain a qualitative advantage.

Again, how should school tracking affect this direct relationship between social origin and destination? On the one hand, credentialist and signalling theories predict a stronger influence of formal degrees and a weaker direct

influence of parental characteristics (e.g., through networks or non-cognitive skills) in tracked systems (e.g., Bol and van de Werfhorst 2011; Collins 1979; Jacob, Klein and Iannelli 2015; Mastekaasa 2011; Spence 1973). As described above, in tracked systems, educational credentials carry more weight. Net of these credentials, tracking could thus reduce the direct impact of social background and consequentially have a negative impact on social reproduction.

On the other hand, tracking might reinforce the influence of social origin because the tighter linkage between qualifications and occupations increases the importance of qualitative educational choices, such as field of study or type of university, that are likely to be affected by parental decisions (in line with Jacob, Klein and Iannelli 2015). Moreover, as occupational changes become less likely, the occupation at labour market entry becomes more important for one's status over the life-course. Parental networks or strategic knowledge may thus be more important in tracked systems. From a theoretical standpoint, therefore, the direction of the effects of school tracking on the direct association between social origin and destination is ambiguous.

Summarizing the three theoretical mechanisms under study, we anticipate that school tracking reinforces educational inheritance and the impact of formal degrees on occupational status. However, the effects of tracking on the direct effect of social origin net of education remain ambiguous, leaving the total effect of school tracking on social reproduction unclear. We could assume an overall null effect of tracking on social reproduction if the stronger signalling power of educational credentials reduces the direct influence of social origin to a degree that counterbalances educational inheritance; for example, educational inheritance would be more pronounced, but parental networks after graduation might be less important. We would on the other hand assume an overall positive effect of tracking on social reproduction if, for instance, qualitative educational choices become more important; for example, if the type of vocational or academic training becomes more important, and this aspect should still be affected by parental decisions and resources.

Data and operationalization

To comparatively assess the impact of school tracking on the process of social reproduction, we draw on the sixth and seventh rounds of the European Social Survey (ESS) from 2012 and 2014.[4] This cross-national survey collects individual-level data from 29 (2012) and 22 (2014) countries. Each country provides a random sample of private households' residents over the age of 15 (European Social Survey 2016a, 2016b). Due to country-specific differences in accessibility or sampling frames, a variety of sample designs, such as stratified random samples, multi-stage sample designs or combinations, have been used.[5] Because the ESS draws independent samples, pooling the two years is

non-problematic and provides us with a larger sample and variety of countries. We restrict our sample to respondents younger than 35 years of age, as tracking systems in multiple countries were reformed during the 1960s and 1970s, and younger cohorts are more likely to have been affected by the current tracking system. After excluding respondents that have a missing value on any of the independent or dependent variables and after restricting the sample to respondents younger than 35 years of age, we arrive at a sample of 14,017 employees (unrestricted sample: 72,970) from 24 countries. We use the Socio-Economic Index of Occupational Status (ISEI) to measure social status (Ganzeboom, De Graaf and Treiman 1992). Because social class is only included as broad categories and income is only measured in deciles of the actual household income range in countries, the ISEI thus provides us with the most detailed operationalization of social status. The status values, which are included in the ESS dataset, are constructed using data from the pooled International Social Survey Programme (ISSP) waves from 2002 to 2007 and range from 11.01 (Subsistence Livestock Farmers) to 88.96 (Judges). We exclude respondents who are unemployed at the time of the interview, as we could not assign them a status value.[6]

Because the ESS contains respondents of different ages and at different points in their careers, our results may depend on the *intra*generational mobility regimes of the studied countries (i.e., social reproduction may seem greater when observing labour market entrants than when observing later-career employees). To assess these effects, we calculate additional analyses with subsamples of different age groups (see robustness checks section).

Social origin is measured using parental education (the highest level of mother's or father's education[7]). We use values based on the 'European Survey version of the International Standard Classification of Education' (ES-ISCED), which allows us to compare educational attainment across different countries. The ES-ISCED scale was introduced by Schneider (2010) and ranges from 1 (no formal qualification) to 8 (doctoral or equivalent level). We subsume the ES-ISCED into five categories to establish a clearer hierarchy of educational groups (compare Table I).[8] We use the same classification to measure the respondents' education. An alternative measure of social origin would be

Table I: *Aggregated ES-ISCED categories*

Aggregated ES-ISCED Categories	Description
1	No formal qualification and lower secondary education (I, II)
2	Upper-secondary qualification (IIIb, IIIa)
3	Post-secondary qualification and post-secondary non-tertiary qualification (IV)
4	Bachelor's degree level or equivalent (V1)
5	Master's degree level, equivalent or higher (V2)

parental occupational status, which is unfortunately not available in the ESS. The theoretical predications, however, are even clearer for parental education because of its importance for educational attainment.

School tracking is measured using an index, which is constructed by performing a factor analysis on three country-level indicators of tracking (Bol and van de Werfhorst 2016).[9] The first indicator is age at first selection, which signifies the start of the tracking process. The second indicator is the percentage of the total curriculum in secondary education that is tracked. The third indicator is the number of distinct school tracks that are available for 15-year-old students (Bol and van de Werfhorst 2016). The number of different educational programmes represents the number of choices in an educational system. This indicator measures the extent to which secondary education is differentiated between schools, which is usually characterized by separation of the full curriculum and by physically separating students (Bol and van de Werfhorst, 2016). Within-school differentiation is not captured by the indicator; however, the physical separation should have a larger effect on the mechanisms described above. The index is standardized and varies between 1.86 (Germany; highly tracked) and −1.04 (Norway and the United Kingdom,[10] with the lowest degree of tracking). The index only considers education in the form of schooling and ignores academic or informal training. The age of first selection and the number of tracks available at age 15 are measured in 2003, whereas the length of the tracked curriculum is measured in 2002. All single indicators vary substantively between countries (see Online Appendix Table A1).

Additionally, we control for factors that may influence occupational status, education and selection into schooling tracks. These include age, sex, household size and a dummy indicating whether the respondent was born in the country in which he or she is living. We simultaneously account for the respondent's partner and the partner's education with dummy variables. Table II presents the summary statistics for all the variables used in the analysis (pooled over all countries).

Analytical strategy

We are interested in how school tracking affects social reproduction and to what degree tracking affects the various relationships between parental education, educational attainment, and occupational status. To test the effects of tracking on the process of social reproduction, we follow the analytical approach of Jerrim and Macmillan (2015) and first calculate j country-specific regressions to analyse the effect of parental education on occupational statuses (β_j), which is our measure of intergenerational social reproduction (O on D):

$$D_{ij} = \alpha_j + \beta_j O_{ij}^{\text{Parent}} + \vartheta_j X_{ij} + \varepsilon_{ij} \nabla J, \qquad 1$$

Table II: *Descriptive statistics*

Variable	Mean	Std. Dev.	Min	Max
Tracking	0.04	0.97	−1.04	1.86
ISEI	42.45	20.90	11.01	88.96
Education	2.68	1.30	1.00	5.00
Parental education	2.73	1.38	1.00	5.00
Female	0.50	0.50	0.00	1.00
Age	26.54	5.08	14.00	34.00
No partner	0.56	0.50	0.00	1.00
Partner with lower or equal education	0.33	0.47	0.00	1.00
Partner with higher education	0.11	0.31	0.00	1.00
Persons in household	3.00	1.37	1.00	6.00
Migration status	0.10	0.31	0.00	1.00

Note: 14,017 observations from 24 countries.
Source: ESS round 6 and 7.

where D_{ij} is the occupational status of individual i in country j. α_j is the country-specific intercept, O_{ij}^{Parent} the highest level of individual i's parents' education, X_{ij} a vector of individual-level control variables (without education), and ε_{ij} the individual error term. ∇J refers to the same model being calculated for all j countries.

We then decompose the country-specific effects of parental education on occupational status (β_j) into three parts:

$$\beta_j = (\gamma_j * \lambda_j) + \delta_j \nabla J,$$

2

where $\gamma_j * \lambda_j$ signifies the effect mediated through the respondent's education. In detail, λ_j represents the effect of O on E (educational inheritance), γ_j represents the effect of E on D (educational returns), and δ_j represents the effect of O on D, net of educational attainment (direct effect of social origin). We estimate λ_j by regressing educational attainment on parental education, including all X_{ij} control variables:

$$E_{ij} = \tau_j + \lambda_j O_{ij}^{\text{Parent}} + \phi_j X_{ij} + \varepsilon_{ij} \nabla J.$$

3

The remaining effects γ_j and δ_j are estimated, including educational attainment E_{ij} in Equation (1) and again estimating j country-specific regressions:

$$D_{ij} = \omega_j + \gamma_j E_{ij} + \delta_j O_{ij}^{\text{Parent}} + \psi_j X_{ij} + \varepsilon_{ij} \nabla J.$$

4

Finally, we correlate $\beta_j, \gamma_j, \lambda_j$, and δ_j with the degree of school tracking t (Pearson's correlation (ρ)) to analyse whether and to what degree the total

Figure II: *Effect decomposition of social reproduction*
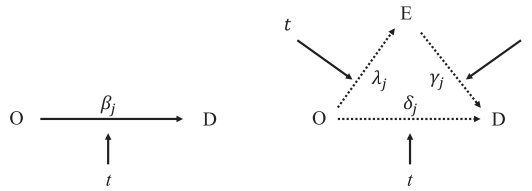
effect of social reproduction and the three single mechanisms vary according to the degree of school tracking. Figure II shows the parameters in which we are interested when assessing and decomposing the process of social reproduction.

Results

Social reproduction in industrialized countries

Does the process of social reproduction vary among industrialized European countries, and can tracking explain part of these differences? We find that net of individual-level control variables, and across all countries, the relationship between parental education (social origin) and occupational status (social destination) is positive. However, it varies to a large degree, confirming stark international differences in social reproduction (see Table III).

To assess whether and to what degree social reproduction varies with the degree of tracking, we correlate $\hat{\beta}_j$ with tracking and plot the relationship ($\rho = 0.529^{***}$). Figure III shows the total effect[11] of parental education on the respondent's occupational status ($\hat{\beta}_j$) for each country for different tracking levels, net of control variables. This first descriptive impression supports our expectation: the process of social reproduction seems more pronounced in countries with higher degrees of school tracking. In countries with the lowest degrees of tracking, one would expect an increase of approximately three ISEI scores with a one-unit increase in parental education, whereas countries with the highest degrees of tracking would exhibit an increase of more than six status scores. Although in general school tracking seems to be associated with higher levels of social reproduction, the questions of through which channels tracking affects this relationship remains.

School tracking and its impact on mechanisms of social reproduction

To obtain a more comprehensive picture of the mechanisms underlying the effect of tracking on social reproduction, we first decompose β_j into three parts: educational inheritance ($O\ to\ E, \lambda_j$) educational returns ($O\ to\ E, \gamma_j$), and the direct effects of social origin($O\ to\ E, \delta_j$), and analyse whether these effects vary by the degree of tracking (Table IV).

Table III: *Country details*

Country (j)	Number of observations (N)	Mean parental education (O^{Parent}_{ij})	Mean ISEI (D_{ij})	Beta (*measure of social reproduction*) ($\hat{\beta}_j$)*	School tracking (t)
Austria	364	2.29	40.70	6.12	1.82
Belgium	677	2.94	43.51	3.68	1.02
Bulgaria	251	2.52	40.48	6.57	−0.02
Czech Republic	591	2.68	43.62	5.86	1.62
Denmark	720	3.14	39.95	3.31	−0.87
Finland	870	3.08	40.60	3.17	−0.87
France	580	2.59	42.68	5.91	−0.47
Germany	1048	2.96	43.88	3.86	1.86
Hungary	339	2.25	36.74	6.49	1.42
Iceland**	245	3.13	41.05	1.28	−0.81
Ireland	818	2.42	41.79	4.51	−0.30
Israel	1111	3.06	45.39	2.50	−0.06
Italy	173	2.06	41.93	5.84	0.17
Netherlands	609	2.60	45.73	3.41	0.94
Norway	734	3.26	42.61	2.91	−1.04
Poland	779	2.21	42.91	4.40	−0.08
Portugal	456	1.52	37.36	5.27	−0.33
Russian Federation	500	3.66	43.73	1.78	−0.39
Slovakia	289	2.46	42.58	5.23	1.62
Slovenia	348	2.37	43.75	4.62	0.12
Spain	530	2.06	40.21	2.64	−1.02
Sweden	777	3.16	40.98	3.51	−0.87
Switzerland	669	2.59	45.51	4.95	−0.14
United Kingdom	539	2.62	42.84	2.75	−1.04
Complete sample	14,017	2.73	42.45	3.85	0.04

Notes: Observations represent j country-specific estimations $\hat{\beta}_j$; all estimates are weighted by the number of observations per country. Alternative weighting using the inverse of the point estimate's standard errors did not substantially change the results.
*Beta coefficients based on the estimation of Equation (1).
**Beta estimates for Iceland are non-significant.
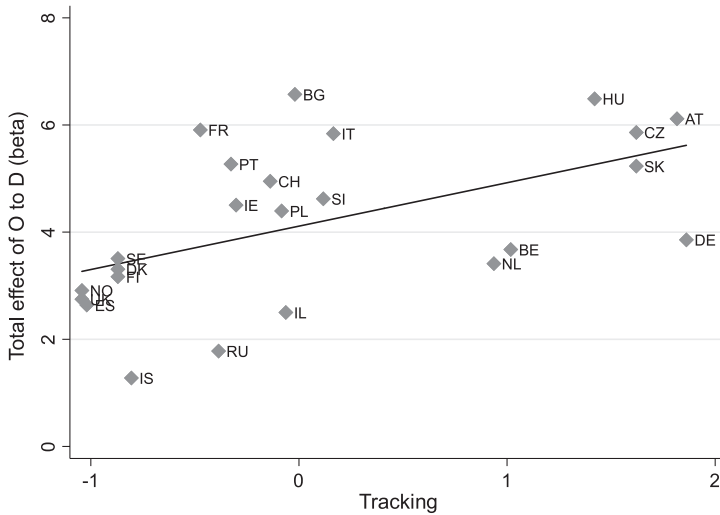*Source:* ESS rounds 6 and 7.

Figure III: *Total effect of parental education on occupational status by degree of school tracking*

Figure IV first shows the effect of social background that operates through education and the direct effect of social origin that operates net of education (A). Second, it disentangles the through-education effect and shows how the effects of educational inheritance $(O\ to\ E, \hat{\lambda}_j)$ and educational returns $(O\ to\ E, \hat{\lambda}_J)$ vary according to the degree of tracking (B).

The graphs indicate that the effect of social origin on destination, which is mediated through education, is larger in countries with high degrees of tracking $(\hat{\lambda}_j * \hat{\gamma}_j, \rho = 0.423^*)$. The bottom graphs further unpack the through-education effect and show that the association between parental education and educational attainment clearly increases with tracking $(\hat{\lambda}_j, \rho = 0.474^{***})$. With the exception of Germany, countries with high degrees of tracking (for example, Austria, the Czech Republic, Slovakia and Hungary) all have estimated coefficients above the average of 0.29, indicating that parents' education is a very strong determinant of educational attainment. Countries or territories with a low degree of tracking (for example, the United Kingdom, Norway, Denmark, Finland and Sweden) mostly fall below that value.

We do not find that educational returns, the relationship between education and occupational status, increase with school tracking $(\hat{\gamma}_j)$. This is surprising, as previous studies have emphasized higher importance of educational degrees for status with higher degrees of tracking or educational stratification (e.g., Allmendinger 1989; Shavit and Blossfeld 1993). Additional analyses show that these previous positive findings can be ascribed not only to the selection of specific countries but also to the omission of the effects of parental education on educational attainment and status. Failure to consider all the effects may therefore lead to incomplete conclusions when analysing the impact of

Table IV: *Effect decomposition of social reproduction*

Country (j)	Social reproduction (O to D; $\hat{\beta}_j$) [a]	Educational inheritance (O to E; $\hat{\lambda}_j$) [b]	Educational returns (E to D; $\hat{\gamma}_j$) [c]	Direct effects of social origin (O to D; $\hat{\delta}_j$) [c]	Through education effect ($\hat{\lambda} * \hat{\gamma}$)	School tracking (t)
Austria	6.12***	0.34***	11.02***	2.32**	3.79	1.82
Belgium	3.68***	0.33***	8.11***	1.03*	2.65	1.02
Bulgaria	6.57***	0.45***	10.88***	1.66*	4.91	-0.02
Czech Republic	5.86***	0.45***	8.36***	2.12*	3.74	1.62
Denmark	3.31***	0.19***	9.84***	1.49**	1.82	-0.87
Finland	3.17***	0.19***	10.21***	1.21**	1.96	-0.87
France	5.91***	0.41***	9.36***	2.09***	3.82	-0.47
Germany	3.86***	0.26***	9.94***	1.22*	2.63	1.86
Hungary	6.49***	0.53***	10.28***	1.00	5.49	1.42
Iceland	1.28	0.18***	9.01***	-0.36	1.64	-0.81
Ireland	4.51***	0.41***	8.16***	1.16*	3.35	-0.30
Israel	2.50***	0.15***	9.94***	1.02**	1.48	-0.06
Italy	5.84***	0.44***	7.11***	2.74**	3.10	0.17
Netherlands	3.41***	0.30***	7.70***	1.08*	2.33	0.94
Norway	2.91***	0.14***	9.88***	1.50**	1.41	-1.04
Poland	4.40***	0.37***	9.53***	0.88*	3.51	-0.08
Portugal	5.27***	0.37***	9.16***	1.90**	3.37	-0.33
Russian Federation	1.78**	0.23***	7.61***	0.03	1.75	-0.39
Slovakia	5.23***	0.41***	5.67***	2.91**	2.33	1.62
Slovenia	4.62***	0.17***	6.94***	3.45***	1.17	0.12
Spain	2.64***	0.36***	7.76***	-0.13	2.77	-1.02
Sweden	3.51***	0.24**	9.35***	1.28**	2.22	-0.87
Switzerland	4.95***	0.32***	8.77***	2.15***	2.80	-0.14

Table IV: *Continued*

Country (j)	Social reproduction $(\overline{O\ to\ D};\hat{\beta}_j)$ [a]	Educational inheritance $(O\ to\ E;\hat{\lambda}_j)$ [b]	Educational returns $(E\ to\ D;\hat{\gamma}_j)$ [c]	Direct effects of social origin $(O\ to\ D;\hat{\delta}_j)$ [c]	Through education effect $(\hat{\lambda}*\hat{\gamma})$	School tracking (t)
United Kingdom	2.75***	0.25***	6.88***	1.03+	1.72	−1.04
Complete sample	3.85***	0.29***	8.85***	1.30***	2.55	0.05

Notes: Significance levels:
[+] $p < 0.1$, [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$.
Slight differences between estimated effects of social reproduction $(\hat{\beta}_j)$ and calculated effects $\left(\hat{\beta}_j = \left(\hat{\gamma}_j * \hat{\lambda}_j\right) + \hat{\delta}_j\right)$ possible because of the rounding of estimated effects.
[a]Coefficients based on estimation of Equation 1.
[b]Coefficients based on estimation of Equation 3.
[c]Coefficients based on estimation of Equation 4.
Source: ESS rounds 6 and 7.

Figure IV: *The impact of school tracking on channels of social reproduction: (A) Through-education and direct effects of social origin; (B) Decomposition of through-education effect by school tracking*
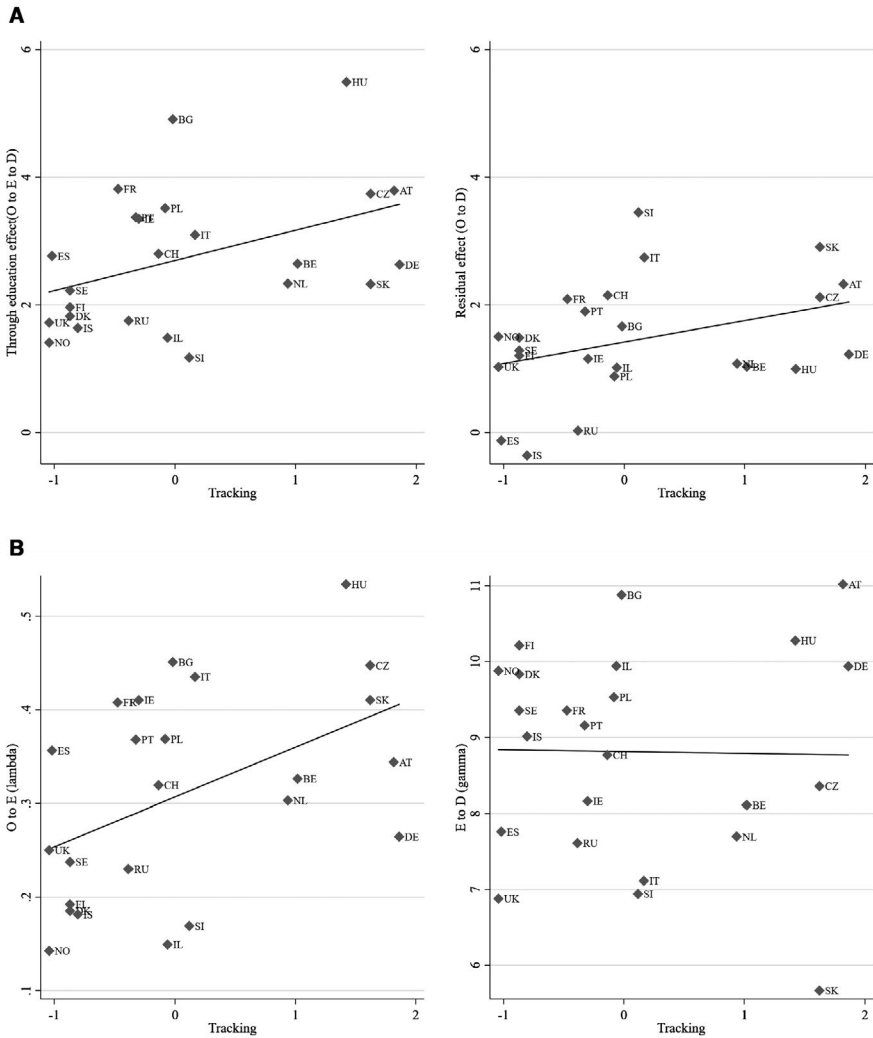
Note: Observations are j country-specific estimations for $\hat{\beta}_j$, $\hat{\gamma}_j$, $\hat{\lambda}_j$ and $\hat{\delta}_j$. All estimates are weighted by the number of observations per country.
Source: ESS rounds 6 and 7

tracking on either social reproduction or single parts of the OED triangle. Moreover, most of the studies date back around 25 years or more.

Analysing the impact of tracking on direct effects of social origin, or the association between parental education and occupational statuses, net of education, we find that it significantly increases with tracking ($\hat{\delta}_j, \rho = 0.363^+$). The effect of tracking on the direct effects of social origin is almost as large as the

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through-education effect. This finding supports theories that emphasize the increasing importance of qualitative educational choices, such as field of study or vocational fields with higher degrees of tracking, and opposes predictions derived from credentialist and signalling theories that assume a decreasing importance of parental characteristics with higher degrees of tracking. The increased importance of qualitative choices may be attributable to the tighter linkage between educational degrees and occupations: changes to other occupations become less likely and choices in the educational system carry more weight in determining one's status. The increased impact of direct effects of social origin might also be attributable to a greater importance of parental networks. Because higher degrees of tracking are usually associated with lower degrees of occupational mobility, and occupations at labour market entry become more important, parents' strategic knowledge and networks that facilitate access to more prestigious jobs play a greater role.

Because the direct effect of social origin is defined as the residual effect of social reproduction when taking into account education, the effect size is highly dependent on how educational groups are defined. A broader definition of education with fewer educational degrees and thus may more heterogeneity within educational groups would most likely give more weight to networks or qualitative educational differences in explaining occupational status, whereas a more fine-grained definition could theoretically explain more of the effect of parental education on the status.

To learn more about the specific characteristics of school tracking in the process of social reproduction, we also differentiate between the single indicators (age of first selection, proportion of differentiated curriculum and number of tracks at age 15). Table V reports the correlations of the indicators with country-specific effects for educational inheritance, educational returns and direct effects of social origin. Interestingly, the single indicators of tracking (although highly correlated) seem to affect social reproduction differently. Age of first selection and the proportion of differentiated curricula are both mainly associated with higher degrees of educational inheritance. They thus positively affect the through-education effect. This result is not surprising, given that a younger age of first selection should increase the weight of parental decisions and reduce the time during which students from lower social backgrounds could benefit from those with higher social backgrounds. Likewise, as the proportion of differentiated curricula increases, the time spent in the tracked system increases, which should reinforce the impact of social origin for the same reasons. These indicators are, however, not necessarily associated with a tighter link between education and occupation, which we argued would be the reason for stronger educational return effects and stronger direct effects of social origin. The number of tracks also seem to reinforce educational inheritance but surprisingly are associated with reduced effects of educational returns, resulting in a non-significant through-education effect. One reason why educational

Table V: *Interaction effect of school tracking and tracking components with social reproduction channels*

	Tracking * Social reproduction $(t*\hat{\beta_j})$	Tracking * Through education effect $(t*[\hat{\lambda}*\hat{\gamma}])$	Tracking * Direct effects of social origin $(t*\hat{\delta_j})$	Tracking * Educational returns $(t*\hat{\gamma_j})$	Tracking * Educational inheritance $(t*\hat{\lambda_j})$
Baseline (Tracking index)	0.529**	0.423*	0.363+	−0.017	0.474*
Age of first selection	−0.515*	−0.459*	−0.296	−0.027	−0.495*
Proportion of differentiated curriculum	0.463*	0.401+	0.280	0.139	0.386+
Number of educational programmes at 15 years old	0.493*	0.230	0.536**	−0.356+	0.403+

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$.

attainment may have less of an impact on status in systems with a higher number of educational tracks could be the tighter linkage between the educational systems and the labour market. Educational credentials become more important, restricting access to higher status jobs for those without a vocational or an academic degree and reducing the risk of having lower status jobs for those with a degree. As a consequence, average status scores for those with at least a vocational degree are closer to one another (thus reducing the effect of educational attainment on occupational status). We would also expect that qualitative choices in educational tracks become more important (as, for example, ICT-based occupations usually offer higher pay and status than social occupations). Indeed, the number of tracks is the only indicator that is associated with a stronger direct effect of social origin, further supporting the notion that qualitative differences in educational choices become more important in tracked systems and may further entrench social reproduction.

Robustness checks

To test the robustness of our results, we recalculated our models using different model specifications (see the Online Appendix for a thorough description of all robustness checks and results). The results were robust to various sample restrictions, education variables and imputed values using multiple imputation. As lower degrees of tracking might reflect a general preference for equal opportunities, in which case social reproduction would not necessarily be ascribable to school tracking itself, we controlled for additional variables when analysing the impact of tracking. To test for this alternative explanation, we control for social expenditures (World Bank, OECD, and Eurostat databases) and preferences for governmental redistribution (ESS). None of these measures change our results substantively. We also use the degree of vocational enrolment instead of tracking because tracking might insufficiently capture the connection between educational degrees and occupations. However, the relationship between vocational enrolment and the association between E and D remains insignificant, whereas direct effects of social origin become stronger with higher shares of vocational enrolment, again supporting the notion that qualitative differences in educational choices become more important.

Discussion and conclusion

Social stratification and mobility are core interests in sociology. Education has long been recognized as playing a central role in social reproduction and it is well known that educational systems affect both educational inheritance and educational returns. However, little is known about the influence of school tracking on social reproduction, theoretical predictions are unclear, and there is a lack of empirical evidence.

We use the European Social Survey (ESS) from 2012 and 2014, which provides us with data for 24 countries, and decompose the effects of social reproduction into three mechanisms through which it should operate: educational inheritance, educational returns and direct effects of social origin. We first find that for all countries, the association between parental education and occupational status is significant and positive. This association is stronger in countries with higher degrees of school tracking. Second, analysing whether and to what extent school tracking reinforces these relationships, we find that educational inheritance and direct effects of social origin are stronger in countries with higher degrees of school tracking. Whereas a lower age of first selection and a larger proportion of differentiated curricula are associated with greater educational inheritance, the number of educational tracks is mainly associated with larger direct effects of social origin. While the former effects can be explained by a greater parental influence at younger ages and less time for children to benefit from a diverse classroom setting, our explanation for the latter effect mainly rests on qualitative differences within educational groups. Choosing a field of study or vocational track is likely affected by parental background. A larger number of tracks is usually associated with a stronger connection to occupational labour markets. It thus becomes more difficult to change occupations, which means that deciding on the type of vocational or academic training (e.g., preparing for ICT or social occupations) determines occupational status already at a fairly early stage.

Contrary to both our predictions and previous findings, we do not find that tracking moderates the relationship between educational attainment and occupational status. It seems that in tracked systems, qualitative differences in educational choices become more important, whereas the level of educational attainment does not. Although further research is needed, we suspect that this result reflects that in countries with strong vocational systems, having obtained a vocational or academic degree generally is associated with higher status jobs. Variation in status is then mostly generated from qualitative differences in fields of study or vocational training.

Having found that school tracking reinforces social reproduction through two channels, we conclude that tracking has more complex effects on social reproduction than previously assumed, operating through education but also through direct effects of social origin. Our findings thus not only show that school tracking is associated with higher levels of social reproduction but also provide a more nuanced understanding of the mechanisms underlying the impact of school tracking.

We acknowledge that our findings are highly dependent on how we measure origin, education and destination. Moreover, countries with lower degrees of tracking may be more egalitarian in various ways, affecting cultural attitudes, values and public policies. However, multiple additional analyses indicate that the patterns are robust to other sample restrictions, definitions of education, country-level egalitarian norms or governmental spending. We also acknowledge

that the distribution of parental education within a country may be affected by national tracking regimes. For example, a highly tracked system may result in a larger share of graduates with vocational degrees. In this case, it would also be more likely that parents and children both obtain these degrees, which would contribute to an inheritance effect. Unfortunately, we cannot investigate this topic separately due to limitations in the data (i.e., we have no standardized information on previous tracking regimes or the education of grandparents).

We emphasize that our results cannot be interpreted as causal effects but instead as detailed descriptions that either support or disapprove theories regarding social reproduction, the effects of educational systems and school-to-work transitions. Our results also support theories that ascribe an equalizing function to both less-tracked education and selecting students into different tracks at a later age.

We suggest that researchers and policy makers should consider the complexity we demonstrated and, for example, focus on the inheritance of inequality between and within educational groups. We encourage further research that not only illuminates the role of school tracking but also evaluates institutional aspects and their impact on life chances and inequality.

(Date accepted: February 2019)

Notes

2. We acknowledge that our results cannot be interpreted as causal effects. For readability purposes, however, we sometimes use the words 'effect' or 'impact' even when referring to a partial correlation.

3. To the best of our knowledge, only one empirical study has analysed the total effect of school tracking on social reproduction, finding no effects on the association between social class and occupational status (Hadjar and Becker 2016). Although this finding seems surprising in light of previous studies that show the effects of tracking on educational inheritance, the reason may lie either in the focus on social class instead of education and the broad dichotomization of countries into those with low and high educational stratification or in the fact that mechanisms indeed cancel each other out.

4. We pool data for rounds 6 and 7 and disregard previous rounds because the classification of occupations (ISCO) changes from version 88 to 08.

5. To account for differences in selection probabilities, the ESS provides post-stratification weights (including design weights) that are based on age, gender, education and region. We use the weights as a robustness check. Because most of the variables are already included in our regressions, weighting does not substantively change our results.

6. We recalculated the analyses assigning an ISEI-value of 0 to all unemployed (see robustness checks section).

7. We calculated robustness checks with different operationalizations of parental education, none of which provided substantially different results (see robustness checks section).

8. We subsume levels I and II as some countries do not have respondents with no formal qualifications and subsume categories IIIb and IIIa as the difference between the two levels lies in access to further education, not in actual vertical educational differences.

9. Data source: http://thijsbol.com/data/. The eigenvalue of the underlying factor is 1.76, signifying high reliability.

10. We exclude Northern Ireland as a robustness check in our analyses as the higher number of selective secondary schools might bias the results. As only 3.6 per cent of the respondents in the UK are in Northern Ireland, the results do not change substantively.

11. To simplify the exposition, we sometimes use the words 'effect' or 'impact' when the estimated parameter refers to a partial correlation.

Bibliography

Allmendinger, J. 1989 'Educational Systems and Labor Market Outcomes', *European Sociological Review* 5(3): 231–50.

Andersen, R. and van de Werfhorst, H.G. 2010 'Education and Occupational Status in 14 Countries: The Role of Educational Institutions and Labour Market Coordination', *British Journal of Sociology* 61(2): 336–55.

Becker, R. 2003 'Educational Expansion and Persistent Inequalities of Education: Utilizing Subjective Expected Utility Theory to Explain Increasing Participation Rates in Upper Secondary School in the Federal Republic of Germany', *European Sociological Review* 19(1): 1–24.

Bernardi, F. and Ballarino, G. 2016 *Education, Occupation and Social Origin: A Comparative Analysis of the Transmission of Socio-Economic Inequalities*, Cheltenham: Edward Elgar.

Blau, P.M. and Duncan, O.D. 1967 *The American Occupational Structure*, New York: John Wiley & Sons.

Blossfeld, H.-P., Buchholz, S., Skopek, J. and Triventi, M. 2016 *Models of Secondary Education and Social Inequality: An International Comparison*, Cheltenham: Edward Elgar.

Bol, T. and van de Werfhorst, H.G. 2011 'Signals and Closure by Degrees: The Education Effect across 15 European Countries', *Research in Social Stratification and Mobility* 29(1): 119–32.

Bol, T. and van de Werfhorst, H.G. 2016 'Measuring Educational Institutional Diversity: External Differentiation, Vocational Orientation and Standardisation', in A. Hadjar and C. Gross, (eds) *Education Systems and Inequalities International Comparisons*, Bristol: Policy Press, pp. 73–94.

Bol, T., Witschge, J., van de Werfhorst, H.G. and Dronkers, J. 2014 'Curricular Tracking and Central Examinations: Counterbalancing the Impact of Social Background on Student Achievement in 36 Countries', *Social Forces* 92(4): 1545–72.

Boliver, V. and Swift, A. 2011 'Do Comprehensive Schools Reduce Social Mobility?' *British Journal of Sociology* 62(1): 89–110.

Boudon, R. 1974 *Education, Opportunity, and Social Inequality: Changing Prospects in Western Society*, New York: Wiley.

Bourdieu, P. 1973 'Cultural Reproduction and Social Reproduction', in R.K. Brown (ed.) *Knowledge, Educational and Cultural Change*, London: Tavistock, pp. 71–112.

Breen, R. 2004 *Social Mobility in Europe*, Oxford: Oxford University Press.

Breen, R. 2010 'Educational Expansion and Social Mobility in the 20th Century', *Social Forces* 89(2): 365–88.

Breen, R. and Goldthorpe, J.H. 1997 'Explaining Educational Differentials: Towards a Formal Rational Action Theory', *Rationality and Society* 9(3): 275–305.

Breen, R. and Jonsson, J.O. 2005 'Inequality of Opportunity in Comparative Perspective: Recent Research on Educational Attainment and Social Mobility', *Annual Review of Sociology* 31: 223–43.

Breen, R. and Yaish, M. 2006 'Testing the Breen-Goldthorpe Model of Educational Decision Making', in S.L. Morgan, D.B. Grusky and G.S.Fields (eds) *Mobility and Inequality: Frontiers of Research in Sociology and Economics*, Stanford, CA: Stanford University Press, pp. 232–58.

Breen, R., van de Werfhorst, H.G. and Jaeger, M.M. 2014 'Deciding under Doubt: A Theory of Risk Aversion, Time Discounting Preferences, and Educational Decision-making', *European Sociological Review* 30(2): 258–70.

Burgess, S., Dickson, M. and Macmillan, L. 2014 *Selective Schooling Systems Increase Inequality.* IZA Discussion Papers, No. 8505, Institute for the Study of Labor (IZA), Bonn.

Collins, R. 1979 *The Credential Society: An Historical Sociology of Education and Stratification*, New York: Academic Press.

Domina, T., Penner, A. and Penner, E. 2017 'Categorical Inequality: Schools as Sorting Machines,' *Annual Review of Sociology* 43: 311–30.

Dubow, E.F., Boxer, P. and Huesmann, L.R. 2009 'Long-term Effects of Parents' Education on Children's Educational and Occupational Success: Mediation by Family Interactions, Child Aggression, and Teenage Aspirations', *Merrill Palmer Q (Wayne State University Press)* 55(3): 224–49.

Duflo, E., Dupas, P. and Kremer, M. 2011 'Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya', *American Economic Review* 101(5): 1739–74.

Erikson, R. and Goldthorpe, J.H. 1992 *The Constant Flux: A Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press.

Erikson, R. and Jonsson, J.O. 1996 *Can Education Be Equalized?* Boulder, CO: Westview Press.

Erikson, R. and Jonsson, J.O. 1998 'Social Origin as an Interest-bearing Asset: Family Background and Labour-market Rewards among Employees in Sweden', *Acta Sociologica* 41(1): 19–36.

European Social Survey 2016a 'ESS Round 6 (2012/2013)', *Documentation Report* 2(3): 1–225.

European Social Survey 2016b 'ESS Round 7 (2014)', *Documentation Report* 3(1): 1–169.

Ganzeboom, H.B.G., De Graaf, P.M. and Treiman, D.J. 1992 'A Standard International Socio-economic Index of Occupational Status', *Social Science Research* 21(1): 1–56.

Gorard, S. 2016 'The Complex Determinants of School Intake Characteristics and Degregation, England 1989 to 2014', *Cambridge Journal of Education* 46(1): 131–46.

Gorard, S. and Siddiqui, N. 2018 'Grammar Schools in England: A New Analysis of Social Segregation and Academic Outcomes', *British Journal of Sociology of Education* 39(7): 909–24.

Hadjar, A. and Becker, R. 2016 'Education Systems and Meritocracy: Social Origin, Educational and Status Attainment', in A. Hadjar and C. Gross (eds) *Education Systems and Inequalities International Comparisons*, Bristol: Policy Press, pp. 231–58.

Hällsten, M. 2013 'The Class-origin Wage Gap: Heterogeneity in Education and Variations across Market Segments', *British Journal of Sociology* 64(4): 662–90.

Hanushek, E.A. and Wößmann, L. 2006 'Does Educational Tracking Affect Performance and Inequality?

Differences-in-differences Evidence across Countries', *Economic Journal* 116(510): C63–76.

Hillmert, S. 2011 'Occupational Mobility and Developments of Inequality along the Life Course,' *European Societies* 13(3): 401–23.

Hout, M. 1988 'More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s', *American Journal of Sociology* 93(6): 1358–400.

Ishida, H., Müller, W. and Ridge, J.M. 1995 'Class Origin, Class Destination, and Education: A Cross-National Study of Ten Industrial Nations', *American Journal of Sociology* 101(1): 145–93.

Jacob, M., Markus, K. and Iannelli, C. 2015 'The Impact of Social Origin on Graduates' Early Occupational Destinations – An Anglo-German Comparison', *European Sociological Review* 31(4): 460–76.

Jerrim, J. and Macmillan, L. 2015 'Income Inequality, Intergenerational Mobility, and the Great Gatsby Curve: Is Education the Key?' *Social Forces* 94(2): 505–33.

Kerckhoff, A.C. 1993 *Diverging Pathways: Social Structure and Career Deflections*, Cambridge: Cambridge University Press.

Kerckhoff, A.C. 1995 'Institutional Arrangements and Stratification Processes in Industrial Societies', *Annual Review of Sociology* 21: 323–47.

Kerckhoff, A.C. 2001 'Education and Social Stratification Processes in Comparative Perspective', *Sociology of Education* 74: 3–18.

Lareau, A. 1989 *Home Advantage: Social Class and Parental Intervention in Elementary Education*, London: Falmer Press.

Lucas, S.R. 2001 'Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects', *American Journal of Sociology* 106(6): 1642–90.

Mare, R.D. 1980 'Social Background and School Continuation Decisions', *Journal of the American Statistical Association* 75(370): 295–305.

Marks, G.N. 2006 'Are Between-and Within-school Differences in Student Performance Largely Due to Socio-economic Background? Evidence from 30 Countries', *Educational Research* 48(1): 21–40.

Marks, G.N. 2014 *Education, Social Background and Cognitive Ability: The Decline of the Social*, London: Routledge.

Mastekaasa, A. 2011 'Social Origins and Labour Market Success: Stability and Change over Norwegian Birth Cohorts 1950–1969', *European Sociological Review* 27(1): 1–15.

McPherson, A. and Willms, J.D. 1987 'Equalisation and Improvement: Some Effects of Comprehensive Reorganisation in Scotland', *Sociology* 21(4): 509–39.

Müller, W. and Karle, W. 1993 'Social Selection in Educational Systems in Europe', *European Sociological Review* 9(1): 1–23.

Müller, W. and Shavit, Y. 1998 'The Institutional Embeddedness of the Stratification Process: A Comparative Study of Qualifications and Occupations in Thirteen Countries', in W. Müller and Y. Shavit (eds) *From School to Work: A Comparative Study of Educational Qualifications and Occupational Destinations*, Oxford: Clarendon Press, pp. 1–48.

Osberg, L. and Smeeding, T. 2006 '"Fair" Inequality? Attitudes toward Pay Differentials: The United States in Comparative Perspective', *American Sociological Review* 71(3): 450–73.

Parker, P.D., Jerrim, J., Schoon, I. and Marsh, H.W. 2016 'A Multination Study of Socioeconomic Inequality in Expectations for Progression to Higher Education: The Role of Between-school Tracking and Ability Stratification', *American Educational Research Journal* 53(1): 6–32.

Pfeffer, F.T. 2008 'Persistent Inequality in Educational Attainment and its Institutional Context', *European Sociological Review* 24(5): 543–65.

Reichelt, M. and Abraham, M. 2017 'Occupational and Regional Mobility

as Substitutes: A New Approach to Understanding Job Changes and Wage Inequality', *Social Forces* 95(4): 1399–426.

Reimer, D. and Pollack, R. 2010 'Educational Expansion and its Consequences for Vertical and Horizontal Inequalities in Access to Higher Education in West Germany', *European Sociological Review* 26(4): 415–30.

Schneider, S.L. 2010 'Nominal Comparability Is Not Enough: (In-)equivalence of Construct Validity of Cross-national Measures of Educational Attainment in the European Social Survey', *Research in Social Stratification and Mobility* 28(3): 343–57.

Shavit, Y. and Blossfeld, H.-P. 1993 *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*, Boulder, CO: Westview Press.

Shavit, Y. and Müller, W.1998 *From School to Work. A Comparative Study of Educational Qualifications and Occupational Destinations*, Oxford: Clarendon Press.

Shavit, Y., Arum, R. and Gamoran, A. (eds) 2007 *Stratification in Higher Education: A Comparative Study*, Palo Alto, CA: Stanford University Press.

Spence, M. 1973 'Job Market Signaling', *Quarterly Journal of Economics* 87(3): 355–74.

Stocké, V. 2007 'Explaining Educational Decision and Effects of Families' Social Class Position: An Empirical Test of the Breen-Goldthorpe Model of Educational Attainment', *European Sociological Review* 23(4): 505–19.

Teachman, J.D. 1987 'Family Background, Educational Resources, and Educational Attainment', *American Sociological Review* 52(4): 548–57.

Treiman, D.J. 1970 'Industrialization and Social Stratification', *Sociological Inquiry* 40(2): 207–34.

Treiman, D.J. and Yip, K.-B. 1989 'Educational and Occupational Attainment in 21 Countries', in M.L. Kohn (ed.) *Cross-National Research in Sociology*, Beverly Hills, CA: SAGE Publications, pp. 373–94.

Triventi, M. 2013 'The Role of Higher Education Stratification in the Reproduction of Social Inequality in the Labor Market', *Research in Social Stratification and Mobility* 32: 45–63.

van de Werfhorst, H.G. and Mijs, J.J.B. 2010 'Achievement Inequality and the Institutional Structure of Educational Systems: A Comparative Perspective', *Annual Review of Sociology* 36: 407–28.

van de Werfhorst, H.G., Sullivan, A. and Cheung, S.Y. 2003 'Social Class, Ability and Choice of Subject in Secondary and Tertiary Education in Britain', *British Educational Research Journal* 29(1): 41–62.

Warren, J.R., Sheridan, J.T. and Hauser, R.M. 2002 'Occupational Stratification across the Life Course: Evidence from the Wisconsin Longitudinal Study', *American Sociological Review* 67(3): 432–55.

Zimmer, R. 2003 'A New Twist in the Educational Tracking Debate', *Economics of Education Review* 22(3): 307–15.

Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Appendix Table A1: Country values for tracking and its components

Appendix Table A2: Interaction effect of school tracking with social reproduction channels based on various sample and measurement definitions