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Institutional change and parental compensation in intergenerational attainment[1]

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Abstract

Previous research has shown how institutional changes, such as educational expansion, have weakened parental influence on educational attainment. We extend this analysis to occupational attainment and put forth a parental compensation hypothesis: as the origin-education (OE) association weakens, parents act to compensate for this in order to maintain their influence on the child's occupational attainment. We should see this as a strengthened origin-destination association net of education (net OD). Further, we study whether these compensatory actions are triggered by changes in educational institutions and whether the institutional changes that reduce educational inequality are the same ones that prompt parental compensation. We have linked data from five waves of the European Social Survey (2002–10) with data on educational institutions matched to birth cohorts born 1941–80 in 25 countries. We find weakened OE and strengthened net OD associations, supporting our parental compensation hypothesis. Multilevel mixed effects regression analyses reveal that reforms lengthening compulsory education, and the increased access to and the attainment of higher education have had a positive influence on parental compensation. As a conclusion, a later school leaving age seems to secure increased parental influence on children's occupational attainment, while parents seem to have reacted to a lesser extent on the changes in higher education.

Keywords: Intergenerational transmission of socioeconomic status; educational institutions; birth cohorts; parental compensation; social inequality; European Social Survey

Introduction

Classical theorists of stratification have claimed that occupational differentiation and hierarchies are necessary for the functioning of societies, and that as societies become more industrialized these positions become increasingly filled

according to merit rather than ascription (Davis and Moore 1945; Kerr, Dunlop, Harbison and Myers 1960; Lipset and Zetterberg 1959). Based on these theories, a weakening association between parents' and children's socioeconomic status has therefore been expected. Furthermore, educational expansion and other educational reforms have been assumed to lead to a reduction in the effect of parental origin on children's educational attainment, which should also translate into a weakening association between the socioeconomic statuses of parents and their children.

The research evidence for these two weakening associations has been diverse but may broadly be described as relatively little or no change having been found in studies conducted up until the 1990s (e.g. Shavit and Blossfeld 1993 for educational inequalities and Erikson and Goldthorpe 1992 for social class mobility), whereas at least some weakening has been found for many countries since then, in particular relating to educational inequalities (e.g. Breen, Luijkx, Müller and Pollak 2009 for education and Breen 2004 for social class mobility). Despite expectations to the contrary, the direct influence of parental origin on children's occupational attainment has persisted to a large extent (Breen 2004; Ballarino and Bernardi 2016).

We argue that as the association between parental origin and child's education weakens, parents act to compensate for this in order to maintain their influence on the child's occupational attainment. Similar arguments have been put forward in studies of educational attainment but the argument has only been extended to the study of occupational attainment recently (Ballarino and Bernardi 2016). More specifically, what we study is whether these compensatory actions are triggered by educational reforms and whether the reforms that reduce educational inequality are the same ones that prompt parental compensation in occupational attainment.

In sociological research, and more specifically in that focusing on social mobility, the relationships between institutions, inequality and intergenerational attainment have been studied surprisingly little. There are a few recent contributions that have examined the role of education policies in educational and income inequality (Brunello, Fort and Weber 2009; Checci and Van de Werfhorst 2014; Pfeffer 2008) but the research linked to intergenerational transmission is scarce (Brunello and Checci 2007). The research on the relationship between institutions and social mobility has tended to investigate these associations at the national level (Aakvik, Salvanes and Vaage 2003; Stadelmann-Steffen 2012), and even when comparisons have been made, the educational reforms included have been mainly from the past few decades (e.g. Schlicht, Stadelmann-Steffen and Freitag 2010). We aim to contribute to the literature by providing results on the association between specific educational reforms and changes in intergenerational occupational mobility, with cohort-level institutional data that covers various educational reforms over 40 years.

Changes in origin-education-destination associations

Studies on intergenerational social inequality tend to focus on the associations of parental origin (social class, socioeconomic status or education) with child's education (OE) and parental origin with child's occupational destination, either overall (gross OD) or net of educational attainment (net OD). Hypotheses about the weakening of these associations have been drawn from theories related to the industrialization of societies and increased merit selection (Davis and Moore 1945; Kerr et al. 1960; Lipset and Zetterberg 1959), as well as changes in educational policies that are expected to reduce inequality, in particular educational expansion. These theories also have implications for changes in the association between education and occupational attainment (ED), though here the expectation of increased merit selection (a strengthening association) has been contrasted with fears of educational inflation (a weakening association).

Recent research has tended to come to the conclusion that a weakening of the OE association has happened in Europe (e.g. Ballarino, Bernardi, Requena and Schadee 2009; Breen and Jonsson 2007; Breen et al. 2009; Doorn, Pop and Wolbers 2011). Moreover, educational expansion has also been found to be associated with increased social mobility opportunities (e.g. Breen 2010; Breen and Jonsson 2007; Hout 1988; Pfeffer and Hertel 2015). Part of the reduced OD association has been attributed to compositional change: as higher education expands, a greater proportion of the population is included in the more meritocratically functioning part of the labour market (Hout 1988; Pfeffer and Hertel 2015; see also Bernardi and Ballarino 2016). On the other hand, previous research has shown decreased returns to education, suggesting educational inflation (e.g. Van de Werfhorst and Andersen 2005; Wolbers, De Graaf and Ultee 2001), and a strong demand for non-merit characteristics by employers (Jackson 2007).

Parental compensation maintaining inequality

Different theories have been developed to explain the relative persistence of inequalities in education and these theories can also be extended to explain the persistence of the OD association.

The relative risk aversion theory (Breen and Goldthorpe 1997; Holm and Jæger 2008) argues that children and parents from all classes try to maximize the chances of the child obtaining a class position at least as high as the parental class position – that is, to avoid downward mobility. If the institutional settings change, it may be expected to influence the premises of educational decisions. For example, open educational pathways may enable the achievement of the same level of educational attainment, and hence socioeconomic prestige, as

parents, despite previous educational decisions, whereas increased tuition fees may prevent this. A recent cross-national study found the direct effect of social origin on occupational attainment to be stronger among individuals with lower education in the majority of the countries studied, pointing to a compensatory effect of parental background (Ballarino and Bernardi 2016).

The Maximally Maintained Inequality (MMI) theory introduced by Raftery and Hout (1993) takes the assumption about the institutional environment more directly into account. The theory argues that parents will try to maintain the strong relationship between family background and education unless an institutional force, such as an increase in higher education attainment, pushes them to change. Educational expansion on its own is not expected to reduce the OE association except when higher classes reach a saturation point. At this stage, educational inequalities begin to decline for that level but continue to be maintained at higher levels of education.

On the other hand, even at the levels of education where educational inequalities have begun to decline, socioeconomically advantaged children may obtain a better education. The Effectively Maintained Inequality (EMI) theory argues that when a level of education becomes more universal (less quantitative difference) socioeconomically advantaged families use their resources to obtain a qualitative difference at that education level (Lucas 2001). In other words, educational expansion pushes advantaged parents to compensate for the decreased quantitative advantage by using their resources and other means in order to secure their advantaged position and to ensure a high socioeconomic status for their children. The increased years of comprehensive education and increased access to higher education, for example, could trigger towards diminishing quantitative advantage.

There is relatively little empirical evidence on the means that parents may use to directly influence their children's occupational attainment even in situations where occupations are not passed from parents to children. One explanation put forward is that many employers demand non-merit characteristics, such as social skills and personal characteristics, in addition to – or even instead of – merit characteristics (Jackson 2007). Certain social skills can be seen as productive in specific occupations by employers and wider social networks can improve employment chances (Erikson and Jonsson 1998). Advantaged families may be able to provide information on career and employment processes, and to form clearer career aspiration, when simultaneously employers can also favour applicants from specific backgrounds for a job (Bernardi and Ballarino 2016; Hällsten 2013).

In conclusion, all of the theories above suggest that if some institutional or personal characteristic, such as educational expansion or lack of skills, threatens the desired educational or occupational outcome of the child, parents use their resources to compensate the negative prospects of their children. This also means that the weakening parental influence on children's education is likely to

push parental compensation to other areas that could benefit children's occupational outcomes. As a result, our *parental compensation hypothesis* assumes that since the origin-education association has weakened and families aim to hold the overall origin-destination association constant by increasing their direct influence (net OD) on children's occupational attainment. In other words:

The origin-destination association net of education has strengthened over time while the origin-education association has weakened (H1)

Changes in educational institutions

Social mobility research has only recently become interested in studying the relationship between policies and intergenerational transmission. As discussed above, parents aim to maintain their influence, and though policies have in many cases weakened the influence of origin on education, we also assume that parents respond to these changes. Naturally, only some institutions are expected to play a role in intergenerational attainment. As the previous literature has elaborated, the substantial institutional changes in education, such as educational expansion, have influenced educational and occupational inequalities and mobility (see e.g. Beller and Hout 2006). Educational reforms that have been studied previously include dead-end educational pathways, access to education, reforms in compulsory education and school tracking (Brunello and Checci 2007; Pfeffer 2008; Schlicht, Stadelmann-Steffen and Freitag 2010; Stadelmann-Steffen 2012). All of these have been found to be linked with changes in intergenerational attainment.

The influence of specific institutions on social mobility may vary between countries due to different national institutional systems (Pfeffer 2008; Schlicht, Stadelmann-Steffen and Freitag 2010). However, a lot of the European countries have gone through similar changes in educational systems, and greater social mobility is widely perceived in European societies. Therefore, a further examination of the specific changes in educational institutions and their relationship with intergenerational mobility is required. We focus on four different types of educational reforms: changes in the proportion of the cohort with completed tertiary education, reforms related to the removal of dead-end educational pathways, implementation and removal of fees in tertiary education, and changes in the minimum school leaving age.

Educational expansion, measured here as the proportion of the cohort with a tertiary education degree, has been expected to increase educational equality by increasing educational attainment and social fluidity, and producing more meritocratic labour markets (Breen 2010; Breen and Jonsson 2007). However, there is also a substantial amount of literature putting forth the argument that

expansion has not increased equality as much as could be expected: instead of improving opportunities of disadvantaged families, educational expansion has benefited middle- and higher-class families (Jonsson and Erikson 2007; Raftery and Hout 1993). This can imply that due to the positional value of education (see e.g. Di Stasio, Bol and Van de Werfhorst 2016), educational expansion has increased the importance of other factors in determining labour market outcomes. We expand this argument and suggest that educational expansion signals to parents their weakening influence on education and pushes them to increase their more direct influence – that is their influence through means other than education – on their children's occupational outcomes. In other words, we assume that:

> *Educational expansion has increased the direct influence of family background on children's occupational status (H2).*

The same could also occur independently of whether the parents pay attention to their weakening influence on education, if the labour markets have begun to value other family background related factors than education more than previously (e.g. Bernardi and Ballarino 2016: 5).

Educational expansion has required various changes in secondary and tertiary education systems, especially in relation to the removal of dead-end educational pathways that have opened up access to tertiary education and increased enrolment rates. However, there is only scarce comparative literature on the relationship between access to higher education and intergenerational attainment (e.g. Rijken, Maas and Ganzeboom 2007). Previous research has focused on how educational policies that reduce dead-end pathways are related to educational mobility: for example Pfeffer (2008) found in his comparative analysis that stratification at the secondary level, that is, the existence of dead-end educational pathways, had a negative association with educational mobility. Because systems with fewer dead-ends provide greater flexibility with regard to educational attainment, undermining the parental influence on children's education, we again expect parents to react against these policy changes by increasing their direct influence on their children's occupational outcomes. Reforms aiming to remove educational dead-ends can have a particular role for opening occupational opportunities and diminishing the importance of clear career aspirations. Rather than occurring slowly as a process like in the case of educational expansion, dead-end reforms are more specifically timed events that may be easier to observe and thereby also more automatically reacted on by parents. Therefore, we argue, similarly to the educational expansion hypothesis:

> *The removal of educational dead-ends has increased the direct influence of family background on children's occupational status (H3).*

One of the often-discussed institutional aspects of educational systems expected to have an impact on the openness of a society is the cost of education.

There has not been a strong common trend related to tertiary education fees and costs in Europe; some countries have developed heavy tuition fee systems, such as the UK, whereas other countries, for example the Nordic countries, consider free education as a strong element of a productive society. Tuition fees put financial constraints on pursuing higher education on children from poorer family backgrounds, lowering their university enrolment rates (Frenette 2007). For instance, Saar (2009) concluded that educational expansion did not weaken the association between origin and destination in Estonia, as happened in Sweden, because of the fees in higher education. This suggests that if educational fees are in place, the parental influence on their children's education is not threatened and as a result, parents do not need to use other means to obtain an advantage. Accordingly, we expect that:

> *The implementation of tuition fees in higher education has decreased the direct influence of family background on children's occupational destination (H4).*

When tuition fees are in place, families with high resources are better able to sustain their advantage to the next generation through education. However, some countries have removed tuition fees (such as Germany and Austria), in which cases the hypothesis is the opposite: the removal of tuition fees in higher education has *increased* the direct influence of family background on children's occupational outcomes.

Finally, we consider the role of the comprehensive schooling system. Most European countries have gone through major changes in compulsory education after World War II by extending the length of compulsory education and postponing educational tracking (Brunello, Fort and Weber 2009; Garrouste 2010). Reforms in compulsory education have been considered as one of the main educational changes that weakened the influence of family background, especially among children from low social origins, and diminished wage inequalities (Brunello, Fort and Weber 2009; Pekkarinen, Uusitalo and Kerr 2009). Furthermore, an increase in the age when finishing compulsory education has been found to have an equalizing effect on intergenerational transmission of socioeconomic status (gross OD); the older young people are, the less dependent they should be on their social background, which promotes both upward and downward mobility (Pöyliö and Kallio 2017). We agree with the previous literature that the reforms in compulsory education have weakened the OE association. However, similarly to our first hypothesis, it may be expected that the influence on the net OD association has been different. Staying longer with parents because of prolonged education also means that children may be longer under the direct influence of their parents. Thus, parents are likely to have a better chance to influence their children's occupational destinations through means other than education. As a result, we expect that:

Increasing the minimum school leaving age has strengthened the direct influence of origin on children's occupational attainment (H5).

Data and methods

We use data from the first five rounds of the European Social Survey (ESS) collected between 2002 and 2010. The ESS provides information on the education and occupation of the respondent as well as parental educational and occupational information from the time when the respondent was 14 years old. Our sample consists of all the countries that have taken part in ESS at least three times within the first five rounds (excluding Cyprus). As a result, 25 countries are included: Austria, Belgium, Bulgaria, Switzerland, Czech Republic, Denmark, Germany, Estonia, Spain, Finland, France, Hungary, the UK, Greece, Ireland, Israel, the Netherlands, Norway, Poland, Portugal, Russia, Sweden, Slovenia, Slovakia and Ukraine.

In order to study the intergenerational transmission of socioeconomic status, the observations are limited to respondents who were between 30 and 69 years old and who were born in 1941–80. Occupational attainment by the age of 30 is found to represent well the occupational destination of a person since attainment improves mostly during the first years in the labour market (Härkönen and Bihagen 2011). Respondents born outside the country of residence have been dropped because around 70 per cent of them had not reported the year in which they had migrated so it is impossible to know whether they lived in the country at the time the reforms took place. As a result, our total sample consists of 104,973 respondents.

Individual level variables

Children: The main individual level dependent variable is the respondent's occupation classified according to the International Socio-economic Index (ISEI), which is based on the International Standard Classification of Occupations (ISCO). For analysis purposes, we have centred the variable to its mean. When investigating OE and ED relations, we use respondents' education measured as reported years of full-time education, limited to 30 years and centred at 12 years. As control variables, we include age (centred at 35), gender and centred year of birth. Descriptive statistics of all the variables are shown in the Appendix (Table A.I).

Parents: The main independent individual level variable is parents' ISEI, which is derived from parental ISCO88. Since parents' ISCO is not available in the ESS dataset, we use online data on parental ISCO categories calculated for ESS respondents by Ganzeboom (2014). We use the dominance principle and choose the highest ISEI of the parents. Unfortunately, we do not have

information on other childhood family circumstances that may influence socioe-conomic attainment.

Cohort-level variables for institutional changes

We use four different cohort-specific variables that measure the changes in educational systems within countries: minimum school leaving age, removal of educational dead-ends, fees in tertiary education and the proportion of a cohort with completed tertiary education. All of these variables have been matched with the equivalent 5-year birth cohorts in each country according to whether they were influenced by the country-specific reforms. The decision to use 5-year birth cohorts instead of accurate birth years was twofold. First, the variable "proportion of a cohort with completed tertiary education" is taken from a comprehensive historical comparative dataset (Barro and Lee 2013), which provides information on educational attainment for 5-year age groups. Second, the information for other variables has been collected from various sources such as databases, articles and other publications (see Table A.II in the appendix for the list of main sources). Sometimes the implementation year of a reform or the information of the first cohort the reform affected differed slightly between sources, and therefore matching the reforms with 5-year birth cohorts is more reliable (for more information see Salonen and Pöyliö 2017).

The minimum school leaving age is measured in years of age. It has increased in all of the countries by two years on average. *The removal of educational dead-ends* measures the reforms in secondary and tertiary education which have reduced the blocked educational paths that have withheld the opportunity to proceed to higher education. The variable is coded in three categories: no reforms, one reform and two or more reforms. *The implementation of tertiary education fees* is a dummy variable that measures whether there were fees in tertiary education at the time the birth cohort was 18 years old. *The proportion of the cohort with completed tertiary education* is measured as the percentage of 25–29 year-olds within each cohort that have a tertiary education degree.

Methods

In order to analyse the associations between origin, education and destination, focusing on the influence of the institutions on parental compensation, we use linear multilevel mixed-effects regression models with country fixed effects and a random slope for parental ISEI (see Schmidt-Catran and Fairbrother 2016). Individuals are nested in 5-year cohort by country clusters, resulting in 200 combinations (level 2 units). The models also include country*origin and reform*origin interactions.

The regression models demonstrate the within-country association between children's and parents' socioeconomic status and how it is mediated by the institutional reforms given the individual-level covariates. We investigate the

influence of the educational institutions on OE and OD associations by includ-
ing an interaction between the reform and origin. The interaction term demon-
strates the direct influence of the educational reforms on the association
between origin and child's outcome. In addition, the models also provide infor-
mation on the variance in the influence of parental ISEI between cohorts (ran-
dom slopes), with which we can estimate the extent to which institutional
reforms explain differences in the influence of parental ISEI between cohorts.

The countries that we study have experienced a great deal of social change
during the 40 years covered by our institutional measurements. This means that
even when the changes in the institutions among nations may have been very
similar, the countries have differed considerably in other aspects that may also
have an influence on the associations of interest. In order to control for the
between-country variation, we use models with country fixed effects, levelling
out the initial differences in the associations and enabling the investigation of
institutional impacts across countries. However, this includes the possibility that
if the reforms have had contrasting influences on parental compensation
between countries, they may cancel each other out resulting in null findings.
Further, it is also possible that other simultaneous but unobserved institutional
changes that correlate with the observed ones in multiple societies are behind
any associations we find, although our comparative setup should reduce chances
to this.

Since the ESS data has a survey nature, we have adjusted the results for
survey sampling. That is, the regression models include ESS design weights as
sampling weights. Design weights denote the possibility that the observation is
included in the sample, thus correcting for possible sample selection bias. From
these sample weights we have created country-specific weights so that each
country has an equal weight in the results, regardless of the sample size in each
country. This way we can eliminate the possibility that specific countries with a
large sample size would dominate the results.

Descriptive results

To investigate the parental compensation hypothesis (H1), we use linear coun-
try fixed-effects regression analysis and demonstrate the origin-education-
destination associations descriptively. The regression models control for gender
and age, but no institutional variables are taken into account. First, we focus on
the general trend in the origin-education association over time. Figure I shows
the cohort*origin interaction association on children's education between 5-
year birth cohorts. Our results show, in line with previous research, a clear and
rapid decline in the OE association over time: it has declined by almost a third
between the first and last cohort, that is, in 40 years. This is a significant
decrease in parental influence on children's education.

Figure I: *Origin-education (OE) association across cohorts (1941–45 as reference)* *[Colour figure can be viewed at wileyonlinelibrary.com]*
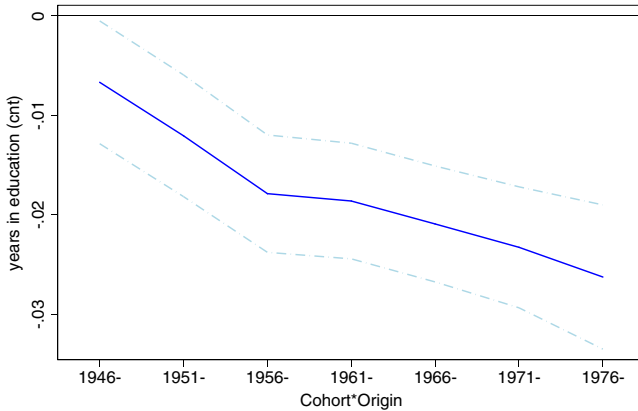
Now we turn to look at the changes in the ED association, the returns to education. Although our primary interest lies in the other two associations (OE and OD), the results on whether educational inflation has occurred in these countries, or whether the returns to education have remained stable or even increased, can include some important indicators when studying the influence of parents on children's outcomes. First, previous research has found clear results for educational inflation in Europe (Bol 2015; Van de Werfhorst 2009). When the value of education decreases, it naturally influences children's occupational outcomes, which is our main focus of interest here. Second, because parental influence on children's education has decreased significantly over time, educational inflation may further influence the reactions of parents. Inflation makes the children's outcomes less secured and thus parents might respond to it by securing occupational outcomes through other routes than education.

Our analysis of the ED association shows that the returns to education have not changed much over time. Figure II demonstrates a slight positive trend in the returns to education across the birth cohorts but the change between the first and last cohort is extremely small. These findings suggest that educational inflation has not taken place; in contrast they actually demonstrate an increase in the returns to education. This could support the theory that the labour market has become more meritocratic. However, in addition to the fact that the estimate is extremely close to zero, we have to keep in mind that it is an average trend over all of the countries. When looking at individual countries we can find both negative and positive coefficients for the change in the ED association. Even though all of the estimates are close to zero, the findings suggest that some, though very minor, educational inflation may have occurred in some of the countries, whereas in others the trend is the reverse.

Figure II: *Education-destination (ED) association across cohorts (1941–45 as reference) [Colour figure can be viewed at wileyonlinelibrary.com]*

Our results so far have shown a weakened OE association and only minor changes in educational returns. Now we turn to look at how the OD association has changed. We use two regression models to study the relationship: (1) a gross OD regression; and (2) a net OD regression where child's education is controlled. Figure III shows the cohort*origin interaction coefficients between birth cohorts in the 25 countries for both regression models. First, in relation to the gross OD association we find that there has not been a remarkable change between the cohorts. This is expected because parents are assumed to maintain the relationship stable. However, when we control for education and look at the net OD association, although we see that the change is relatively small, it

Figure III: *Origin-destination (OD) association across cohorts (1941–45 as reference) [Colour figure can be viewed at wileyonlinelibrary.com]*
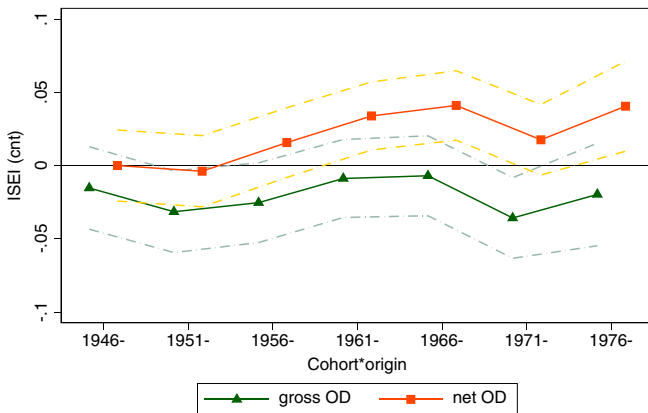
has strengthened over time. Since parents have less influence through education, the direct influence of origin on children's occupational destination has increased. In other words, parents compensate the declining influence on education by increasing their direct influence on the occupational outcomes of their children in order to secure their status attainment. This finding supports our parental compensation hypothesis (H1).

Multivariate analysis

When considering which educational institutions have a significant influence on the association between children's origin and destination, we start by looking at how different institutions have influenced the weakening OE association. Five different regression models were run: the first model does not include any institutional variables whereas in the subsequent models the institutional variables have been included separately with the main effect and an interaction with parental ISEI (see Table A.III in the Appendix).

The results demonstrate a clear influence of educational institutions on respondents' education: three out of four institutions have a significant main association with children's education, and a significant interaction effect with parental ISEI: school leaving age, proportion of cohort with completed tertiary education and removal of educational dead-ends. All of these three institutions seem to have a positive effect on educational attainment, which itself is not surprising due to their characteristics of promoting educational expansion, but they also contribute to the weakening of parental influence on children's education. To demonstrate how the reforms moderate the parental influence, we report the reform*origin interaction as marginal effects plots in Figure IV. Further, the variance results (Appendix Table A.III) show that the proportion of a cohort with completed tertiary education explains just under 24 per cent of the variance of parental ISEI between cohorts, whereas school leaving age explains 29 per cent and the removal of dead-end pathways over 35 per cent of the variance between cohorts.

Now we turn to look at the role of educational institutions in increasing the net OD – the direct influence of parents on children's occupational destinations, with a similar set of regression models. The first model includes only individual-level variables, whereas in the subsequent models the educational institutions are included individually as an interaction with parental ISEI (see Appendix Table A.IV). The influence of institutions on net OD is more diverse than we saw in relation to OE. It seems that again three out of four institutions have a statistically significant independent effect on children's occupational status. However, this time school leaving age, fees and removal of educational dead-ends are influential, whereas the proportion of a cohort with completed tertiary

Figure IV: *OE association and the reforms (marginal effects of parental ISEI, OE models)*
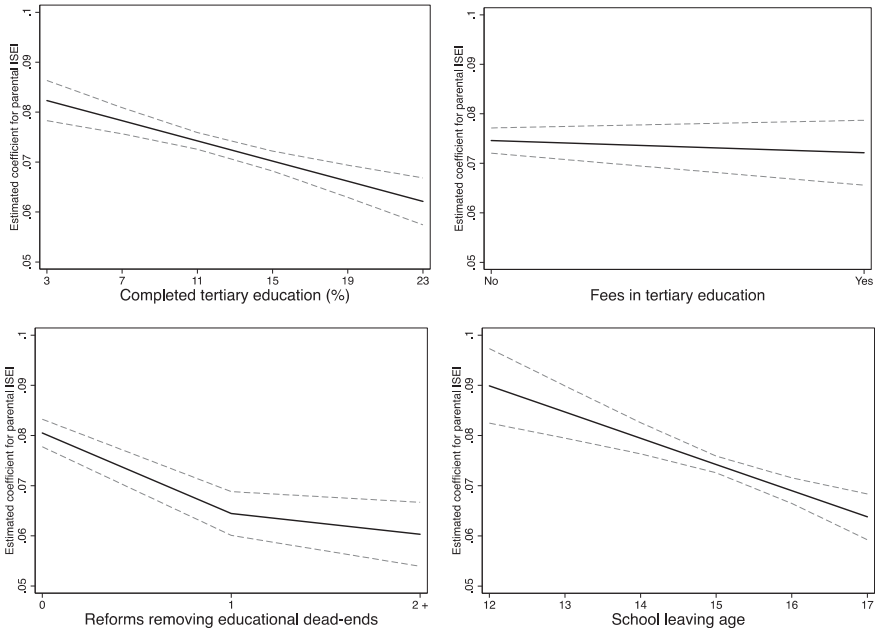

education seems not to be important for children's socioeconomic status in contrast with its effect on educational attainment.

When looking at the interaction coefficients between institutions and origin, we can see that school leaving age, proportion of the cohort with completed tertiary education and removal of dead-end reforms – the same three that were significant on OE – have a significant influence on net OD. Further, as Figure V demonstrates, the positive association expresses that the reforms in these three institutions have contributed towards the increase of direct parental influence on occupational outcomes. Since the reforms found to have weakened OE are the same ones that have increased the net OD, we argue that they have promoted parental compensation. We find a particularly strong influence of school leaving age on parental compensation.

In addition to the direct influence of the institution on OD, we can look at the variances in parental ISEI between cohorts and how including the educational institution in the model changes the variance. Despite the small values of the variances, our calculations show that school leaving age explains almost 18 per cent of the variance in parental ISEI between cohorts within countries. The results for the removal of dead-end pathways and the proportion that have completed tertiary education are merely 7 and 6 per cent respectively.

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Figure V: *Net OD association and the reforms (marginal effects of parental ISEI, net OD models)*
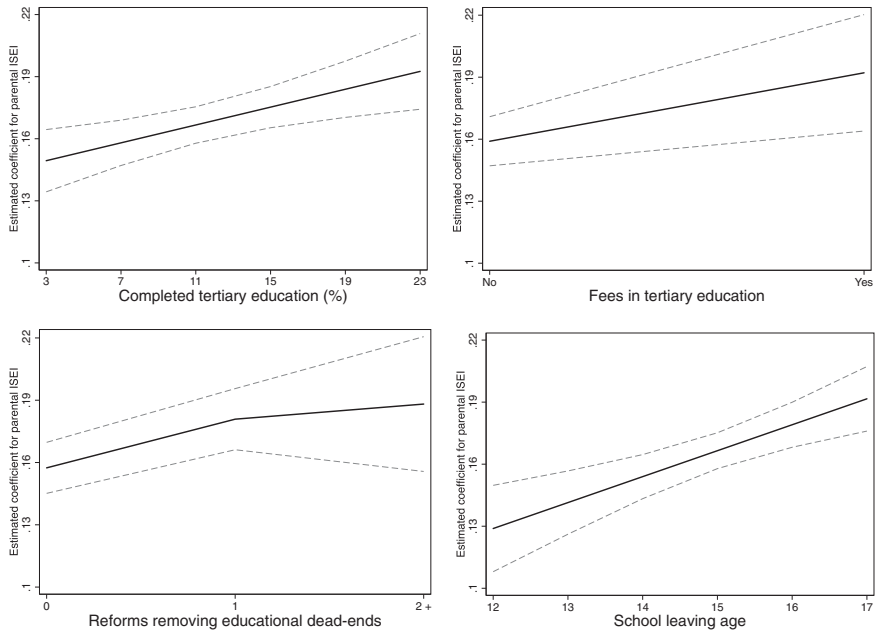
These overall results of the influence of educational institutions on net OD are not found in all of the countries studied and there is some variation between countries (see Appendix Table A.V). Therefore, we checked that these institutional influences on parental compensation are not due to the general development of European countries. We ran the analyses by controlling for cohort-level GDP per capita and found no significant changes in the results. This supports the hypothesis that the increase in parental compensation for the lack of influence on their children's education is not due to the overall development of the societies but the changes in educational institutions.

In addition, to check the robustness of these results we ran the regression models with altered control variables. If we replace age with ESS round or raise the minimum age of the respondents from 30 to 35 years, the results regarding the influence of educational institutions on the net OD association did not differ significantly. There were minor changes in results when limiting the age of respondents to under 55-year-olds; the proportion of the cohort with completed tertiary education loses its statistical significance on net OD whereas tuition fees become significant. This could suggest that tuition fees have had a bigger importance on the origin-destination relationship among the younger cohorts, whereas educational expansion was more influential among the older ones.

Conclusion

Various theories have been developed to explain the persistence of inequalities in education and the labour market. One set of theories (in particular MMI and EMI) argues that parents maintain these inequalities in every possible way they can. We have proposed a parental compensation hypothesis and assume that because parental influence on children's socioeconomic outcomes through education has weakened significantly, parents compensate for this by using other means to promote the desired social status for their children. Our results support this and show that the direct influence of parents, that is the origin-destination association net of education, has strengthened slightly, while the origin-education association has weakened. The findings are in contrast with some recent comparative studies indicating that net OD association would have remained stable or weakened (Ballarino and Bernardi 2016; Marks 2014). However, our pool of countries differs considerably from these studies.

We know from previous research that educational institutions differ between nations, and especially during the 1960s and 1970s European societies went through extensive educational reforms. Our analyses examined four different educational institutions and changes therein (school leaving age, the proportion of the cohort with completed tertiary education, the removal of educational dead-ends and fees in tertiary education) and how they have influenced the changes in OE and the net OD associations. Our results show that school leaving age, the proportion of the cohort with completed tertiary education and removal of educational dead-ends have influenced both the weakening OE and the increasing net OD.

The length of compulsory education has increased in all of the countries studied, meaning that children leave school at an older age. As a result, children live with their parents longer before making educational decisions. Even though the previous literature has demonstrated that extended compulsory education has weakened the OE association because children are not as dependent on their parents at a later age, it seems, according to our results, that increased time spent under parental influence, even at an early age, strengthens the direct influence of origin when looking at occupational attainment. Since parents have more time to affect their children – to promote values, preferences and pass on social capital – they have a greater influence on their children's socioeconomic outcomes even though their impact through education has diminished. This highlights the importance of childhood circumstances and equality of opportunity far before entering higher education.

Our results also demonstrate an influence of the removal of educational dead-end paths, that is, increased access to higher education, and the proportion of the cohort with completed tertiary education on parental compensation. Because of the increased opportunities in higher education, children have not been tied as much to their family origin with regard to educational decisions, but on occupational destination parental influence has strengthened due to

these changes in higher education. Educational expansion and better access to higher education has enabled educational mobility, reducing the origin-education relationship, to which parents react by increasing their direct influence on occupational outcomes.

Our analysis cannot examine the contents of parental compensation and thus we can only speculate what the factors influencing the increase in net OD are, or what the elements that parents use to influence their children's occupation are. Previous research has linked social networks, career aspirations and social capital with socioeconomic status attainment (e.g. De Graaf and Flap 1988; Lin, Vaughn and Ensel 1981; Seibert, Kraimer and Liden 2001). Still, there is only limited evidence on how parental social capital influences children's occupational outcomes, or if the importance of parental social resources on children's outcomes has increased simultaneously with the weakening OE association.

We assumed parents would react to the changes in educational institutions in order to compensate the weakening influence on children's education that the reforms promote. School leaving age seems to have contributed the most to the change in net OD, whereas other reforms have had a weaker influence. However, the lengthening of compulsory education has not required parents to react on it since the reforms have automatically provided them the opportunity to use the extended time at home to influence the child's occupational attainment. This may also extend to the results of other institutions; since increased parental influence is secured by longer compulsory education, parents do not need to react on the changes in higher levels of education as strongly. Therefore, the reforms in higher education (the proportion of the cohort with completed tertiary education and removal of dead-end educational pathways) do not hold a strong signalling value for parents to increase the strength of their direct influence on their children's occupations.

The increased school leaving age explains just under a fifth of the variation in parental compensation within countries (and other institutions even less), which leaves room to question what factors explain the remaining part. We acknowledge that there may be some other institutions or policies related to the labour market or income inequality, for example, that have had an influence on the OD association and parental compensation, but it is beyond the scope of this article to assess these. Also, adequate data on any specific policy reforms are very scarce before the 1980s. However, what we can conclude from the results here is that the reforms in compulsory education and reforms that increase access to higher education have been highly influential in changing the impact of family background on education and occupation. Further, these results are among the few empirical evidence on how specific changes in policies and institutions have influenced changes in intergenerational educational and occupational attainment.

(Date accepted: May 2017)

Appendix

Table A.I: *Summary statistics*

	Mean	SD	Min	Max
Individual-level variables				
ISEI (centred at mean 43.65)	0.31	16.72	−27.34	46.66
Parental ISEI (centred at mean 40.79)	−0.15	16.84	−24.94	49.06
Education in years (centred at 12)	0.78	3.25	−12.00	18.00
Birth year (centred at mean 1959.23)	0.03	10.35	−18.21	20.79
Age (centred at 35)	12.51	10.38	−5.00	34.00
Gender				
Male	47.06%			
Female	52.94%			
Birth cohort				
1941–1945	11.18%			
1946–1950	13.91%			
1951–1955	14.00%			
1956–1960	14.36%			
1961–1965	14.845			
1966–1970	14.50%			
1971–1975	11.90%			
1976–1980	5.31%			
Institutional variables				
Completed tertiary education (%) (centred at mean 11.27)	−0.17	6.49	−10.39	25.73
School leaving age (centred at mean 14.89)	0.03	1.34	−5.86	3.14
Fees in tertiary education				
No fees	75.43%			
Fees apply	24.57%			
Removal of dead-ends				
No reforms (0)	58.32%			
1 reform (1)	29.08%			
2 or more reforms (2)	12.60%			

Table A.II: *Main sources of policy variables*

Policy variable	Source
School leaving age[a]	Brunello, Fort and Weber (2009)
	Fort (2006)
	Garrouste (2010)
Fees in tertiary education[a]	Eicher (1998)
	Vossensteyn (2005)
Proportion of cohort with completed tertiary education	Barro and Lee (2013)
Removal of educational dead-ends[a]	Garrouste (2010)

[a] For country-specific details see Salonen and Pöyliö (2017).

Table A.III: *OE regression models, education as dependent variable*

	Model 1	Model 2	Model 3	Model 4	Model 5
Birth year (cnt.)	0.090***	0.090***	0.090***	0.090***	0.090***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Parental ISEI (cnt.)	0.060***	0.060***	0.060***	0.060***	0.060***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Completed tertiary education (%) (cnt.)		0.027**			
		(0.010)			
Completed tertiary education (%) (cnt.) * Parental ISEI (cnt.)		−0.001***			
		(0.000)			
1 dead-end reform			0.369**		
			(0.121)		
2 or more dead-end reforms			0.833***		
			(0.170)		
1 dead-end reform * Parental ISEI (cnt.)			−0.016***		
			(0.003)		
2 or more dead-end reforms * Parental ISEI (cnt.)			−0.020***		
			(0.004)		
Fees apply				−0.137	
				(0.181)	
Fees apply * Parental ISEI (cnt.)				−0.003	
				(0.004)	
School leaving age (cnt.)					0.203***
					(0.038)
School leaving age (cnt.) * Parental ISEI (cnt.)					−0.005***
					(0.001)
Constant	0.264**	0.264**	0.264**	0.264**	0.264**
	(0.089)	(0.089)	(0.089)	(0.089)	(0.089)
Variance (parental ISEI)	0.00009***	0.00007***	0.00006***	0.00009***	0.00007***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Variance (between cohorts)	0.20479***	0.18777***	0.16846***	0.20384***	0.16768***
	(0.02736)	(0.02508)	(0.02283)	(0.02750)	(0.02533)
Variance (within cohorts)	10.38731***	10.38750***	10.38796***	10.38728***	10.38799***
	(0.26471)	(0.26475)	(0.26476)	(0.26471)	(0.26480)

Note: Standard errors in parentheses. All the models control for country, gender and age.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
  $N = 104{,}973$.

Table A.IV: *Net OD regression models, ISEI as dependent variable*

	Model 1	Model 2	Model 3	Model 4	Model 5
Parental ISEI (cnt.)	0.148***	0.148***	0.148***	0.148***	0.148***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Birth year (cnt.)	−0.211***	−0.211***	−0.211***	−0.211***	−0.211***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Completed tertiary education (%) (cnt.)		0.026 (0.025)			
Completed tertiary education (%) (cnt.) * Parental ISEI (cnt.)		0.002** (0.001)			
1 reform on educational dead-ends			−0.564 (0.305)		
2 reforms			−1.543** (0.488)		
1 reform on educational dead-ends * Parental ISEI (cnt.)			0.023* (0.010)		
2 reforms * Parental ISEI (cnt.)			0.030 (0.019)		
Fees apply				0.964** (0.314)	
Fees apply * Parental ISEI (cnt.)				0.034 (0.018)	
School leaving age (cnt.)					−0.467*** (0.099)
School leaving age (cnt.) * Parental ISEI (cnt.)					0.013*** (0.003)
Constant	0.349	0.349	0.349	0.349	0.349
	(0.421)	(0.421)	(0.421)	(0.421)	(0.421)
Variance (parental ISEI)	0.00103***	0.00097***	0.00096***	0.00100***	0.00086***
	(0.00023)	(0.00021)	(0.00022)	(0.00022)	(0.00022)
Variance (within cohorts)	1.00887	0.99793	0.91811	0.96917	0.85305
	(0.15447)	(0.15400)	(0.13784)	(0.15441)	(0.14027)
Variance (between cohorts)	183.29835***	183.29337***	183.30244***	183.29887***	183.30705***
	(2.48191)	(2.48210)	(2.48232)	(2.48197)	(2.48283)

Note: Standard errors in parentheses. All the models control for country, education, gender and age.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
$N = 104{,}973$.

Table A.V: *Country by country mixed-effects regression results (OE, net OD and reform*origin)*

Country	Sample	OE	Net OD	Educational expansion	1 Dead-end reform	2 Dead-end reforms	Tuition fees	School leaving age
Austria	3362	0.059***	0.158***	−0.009*		−0.091***	0.084***	−0.094***
		(0.003)	(0.017)	(0.004)		(0.024)	(0.019)	(0.016)
Belgium	4200	0.061***	0.186***	0.001		0.001		−0.001
		(0.005)	(0.006)	(0.001)		(0.011)		(0.002)
Bulgaria	3570	0.097***	0.118***	0.006	−0.006**			−0.012
		(0.004)	(0.019)	(0.004)	(0.002)			(0.020)
Switzerland	4200	0.071***	0.207***	−0.007				−0.016
		(0.002)	(0.017)	(0.005)				(0.032)
Czech Rep.	4606	0.057***	0.172***	0.005	x	x	0.125***	0.038
		(0.003)	(0.015)	(0.005)			(0.010)	(0.020)
Germany	7263	0.078***	0.176***	0.000	−0.001		0.019	0.004
		(0.002)	(0.010)	(0.001)	(0.008)		(0.012)	(0.010)
Denmark	4347	0.066***	0.194***	0.003				0.019**
		(0.006)	(0.019)	(0.004)				(0.006)
Estonia	2823	0.057***	0.119***	0.013*				−0.059**
		(0.002)	(0.018)	(0.005)				(0.020)
Spain	4084	0.131***	0.161***	0.006*	0.132***	0.154***		0.074***
		(0.006)	(0.026)	(0.003)	(0.019)	(0.027)		(0.011)
Finland	5369	0.075***	0.169***	−0.007	0.038			0.013
		(0.007)	(0.013)	(0.004)	(0.023)			(0.008)
France	4651	0.074***	0.154***	0.001		−0.097***		−0.010
		(0.002)	(0.020)	(0.004)		(0.020)		(0.027)
UK	5392	0.059***	0.176***	0.000	0.018		0.117***	0.031
		(0.003)	(0.019)	(0.003)	(0.028)		(0.016)	(0.026)
Greece	4132	0.108***	0.168***	0.007***	0.069			0.021
		(0.014)	(0.022)	(0.001)	(0.040)			(0.011)
Hungary	4075	0.091***	0.152***	0.009	0.093***		0.093***	0.009
		(0.002)	(0.017)	(0.005)	(0.018)		(0.018)	(0.010)

Table A.V: *Continued*

Country	Sample	OE	Net OD	Educational expansion	1 Dead-end reform	2 Dead-end reforms	Tuition fees	School leaving age
Ireland	4447	0.052*** (0.003)	0.187*** (0.017)	-0.001 (0.001)	0.057* (0.023)		-0.057* (0.023)	0.025 (0.031)
Israel	2056	0.076*** (0.004)	0.119*** (0.033)	0.009* (0.005)	-0.034 (0.037)			0.071** (0.020)
Netherlands	5145	0.070*** (0.005)	0.167*** (0.012)	-0.002 (0.003)	-0.033 (0.041)	-0.030 (0.033)		-0.009 (0.014)
Norway	4697	0.072*** (0.004)	0.160*** (0.014)	0.005 (0.003)	0.016 (0.028)			0.020** (0.007)
Poland	4544	0.089*** (0.003)	0.154*** (0.019)	0.003 (0.002)	0.005 (0.019)			0.015 (0.009)
Portugal	4486	0.151*** (0.004)	0.120*** (0.018)	0.003 (0.005)	-0.023 (0.021)		-0.117*** (0.011)	0.001 (0.008)
Russia	3565	0.041*** (0.002)	0.101*** (0.011)	-0.002 (0.002)				0.101*** (0.011)
Sweden	4563	0.062*** (0.005)	0.163*** (0.009)	0.011*** (0.001)	0.055** (0.017)	0.086*** (0.019)		0.075*** (0.019)
Slovenia	2148	0.066*** (0.005)	0.146*** (0.021)	0.004 (0.006)	0.001 (0.031)			0.002 (0.069)
Slovakia	3762	0.051*** (0.004)	0.147*** (0.012)	-0.002 (0.006)				0.002 (0.006)
Ukraine	3486	0.037*** (0.003)	0.164*** (0.019)	0.003 (0.002)				0.069*** (0.015)

Note: Empty results indicate that there were no reforms on dead-ends or tuition fees in any of the cohorts.
x = results did not converge.
Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Note

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