How do parents' educational fields affect the choice of educational field?

Abstract

This study examines the links between parental education and students' choice of field of study in Norwegian higher education. In our interpretation of the results, we suggest a status group perspective that integrates risk aversion models, micro-class theory, and cultural reproduction schemes. Complete Norwegian register data for all individuals born from 1955 to 1980 allow for a fine-grained examination of diverse fields of study not attempted in earlier studies. The findings reveal that intergenerational reproduction of educational fields is widespread, but its extent varies across fields of study. The tendency is most pronounced among children of professional, educated parents with masters and higher-level degrees. Moreover, the analysis shows that students who do not choose the same field as their parents none the less tend to choose educational fields close to those of their parents.

Keywords:

Social reproduction

Educational field

Educational choice

Status group reproduction

Introduction

Prior research establishes strong correlations between social background and educational attainment (see, e.g., Breen and Jonsson 2005; Breen et al. 2009; Thomsen et al. 2017).[1] Much also has been learned about the impact of social background on choice of postsecondary educational field (e.g. Davies and Guppy 1997; Ayalon and Yogev 2005; Jackson et al. 2008; Hällsten 2010; Kraaykamp, Tolsma and Wolbers 2013; Thomsen 2015;

Thomsen et al., 2017; Munk and Thomsen 2017). Most studies find that individuals from more advantaged social backgrounds (e.g. high socio-economic status [SES], high income, high educational attainment or service class) tend to choose prestigious fields of study. While valuable, such studies miss possible horizontal differences within the service class and between different educational fields with the same level of prestige, selectivity and labour market outcomes. In this paper, we differentiate 27 educational fields for both parents and children and pose the question of how parents' educational fields affect their children's chosen fields of study. More specifically, we investigate (1) the extent to which individuals complete degrees in the same fields as their parents and (2) whether children who do not follow in their parents' footsteps tend to choose fields of study similar to their parents'.

Answering these questions is important as the expansion of higher education in recent decades has led to inflation of educational credentials, and the distinctions between educational fields have become more relevant to life chances. Fields of study exert considerable effects on the labour market (Reimer, Noelke and Kucel 2008; Kelly, O'Connell and Smyth 2010). Some fields lead to occupations with high levels of prestige, power and wealth, while others do not (for a review, see Gerber and Cheung 2008). Educational choice, is however not only about hierarchy, prestige, power and wealth, but is also connected to cultural factors like values and identity. From a unidimensional perspective, it is difficult to understand why students choose fields such as the humanities and theology. Our multidimensional approach emphasising cultural differences within the highly educated middle classes, suggests a framework that makes such choices reasonable.

To improve understanding of educational choice, we develop what we label a status group perspective that combines insights from micro-class theory with elements of Breen and Goldthorpe's (1997) relative risk aversion hypothesis (see also Boudon 1974) and Bourdieu's cultural reproduction scheme (Bourdieu and Passeron 1990). This hybrid framework is used

to develop a theoretically informed typology of closeness between educational fields at the postsecondary level. From an empirical standpoint, this research demonstrates the advantages of using highly detailed national register data. Survey data, which have informed most previous research on these associations, do not permit such a detailed assessment. Finally, we argue that the Norwegian case provides a good test of these self-recruitment processes as access to tertiary education in the country is nearly unrestricted by economic barriers (i.e. free tuition, affordable loans and generous public subsidies for students). The comparatively low costs make the choice of field of study more real for most students than in countries where economic barriers may significantly restrict this choice. Furthermore, in contrast to countries like UK and the USA, the Norwegian education system lacks private elite institutions at both secondary and tertiary level.

Previous studies

Previous studies on choice of educational field usually retain the hierarchical approach (Kraaykamp, Tolsma and Wolbers 2013: 891) from the literature on educational attainment. Comparisons are made between high and low categories of social background variables (e.g. social class variables, SES scales, cultural capital and family income) and educational fields (e.g. using indices of different average outcomes, such as average income, SES or the probability of high income, unemployment and obtaining a service class position) (Hansen 1997; Davies and Guppy 1997; Ayalon and Yogev 2005; Jackson et al. 2008; Zimdars, Sullivan and Heath 2009; Hällsten 2010; Reimer and Pollak 2010; Thomsen et al. 2017). In a process analogous to the effectively maintained inequality regime characterizing secondary school tracking in the United States (Lucas 2001), these studies find that people with high social origins (e.g. high SES, high income, higher education or service class) tend to choose prestigious, high-income fields, whereas working-class students choose less selective programs of shorter duration that carry less social advantage (Ayalon and Yogev 2005;

Hällsten 2010; Reimer and Pollak 2010). Although much of the higher educational system has been opened to students from working-class backgrounds, class-based differences persist in recruitment inequalities for elite educational fields (Davies and Guppy 1997; Hansen 1997, 1999; Zimdars, Sullivan and Heath 2009; Strømme and Hansen 2017). While valuable, the hierarchical approach misses possible horizontal differences within the service class and between educational fields with the same level of prestige, selectivity or average labour market outcomes. We examine these differences through a detailed classification of the educational fields of both parents and children.

Van de Werfhorst, de Graaf and Kraaykamp (2001) are highly aware of the horizontal differences between educational fields but do not treat the vertical status dimension due to their limited number of observations. They introduce fathers' education level as a separate variable covering all tertiary education and identify only seven educational fields. For instance, they cluster together medical and caring fields, 'which might underestimate intergenerational reproduction of medical doctors' (van de Werfhorst, de Graaf and Kraaykamp 2001: 290–1). Helland's (2006) findings offer further evidence that parental social background predicts students' choice of field of study, at least at the masters' level. Helland's (2006) study on Norwegian elite education shows that students tend to choose either the same or proximal educational fields as their parents'. Helland (2006), however, does not inform us about how the connection between parents' and children's choices plays out in the broader landscape of educational fields and at the masters' and bachelors' levels. Addressing this question is a central contribution of our study using a broader selection of birth cohorts.

Kraaykamp, Tolsma and Wolbers (2013) also pay attention to horizontal differences but maintain a hierarchical conception of educational fields in their explanations. They find that parental field of study is important to both children's education level and field. Their

measurements are somewhat more fine-grained than those of Van de Werfhorst, de Graaf and Kraaykamp (2001). They identify 11 educational fields and distinguish between the medical and the caring fields, but it remains uncertain whether reproductive tendencies occur among physicians, dentists or nurses. Theoretically, Kraaykamp, Tolsma and Wolbers (2013) maintain the hierarchical status attainment model. In our paper, we expand the number of educational fields (27 within tertiary education) and employ a theoretical model which opens up more qualitative differences between educational fields understood as nominal categories.

The previous research with the most in common with our study analyses reproductive tendencies at the occupational level. Weeden and Grusky's (2005) micro-class approach posits that mechanisms previously ascribed to large, aggregate classes actually operate more strongly at the occupational level. Inspired by the micro-class approach, van de Werfhorst and Luijkx (2010) examine how the father's occupational domain affects the child's choice of educational field. They find that 'children often choose fields affiliated to their father's occupational domain' (van de Werfhorst and Luijkx 2010: 708) and that this choice helps children to attain similar class positions as their parents (710). Similarly, Munk and Thomsen (2017) study how recruitment into 14 fields of higher education at the university (masters') level varies among 13 categories of paternal occupation (10 maternal occupations) and find that students tend to choose fields closely related to their parents' occupational categories. Jonsson et al. (2009) adopt the micro-class perspective and find that reproductive mechanisms are stronger at the occupational (or micro-class) level than at the level of big aggregate classes. They also report that the degree of reproduction varies between occupations and uncover 'pockets of extreme micro-class rigidity' (Jonsson et al. 2009: 983). This perspective is highly relevant to our analysis. How we expect the strength of these mechanisms to vary among educational fields and where we expect to find pockets of rigidity are described in the following.

The Norwegian Context

We talk of students *choosing* fields of study, but in some cases, these choices might be restricted or constrained. In Gambetta's (1987) classic trichotomy, the structuralist view on educational choice considers human action to be 'channelled by external constraints which do not leave any substantial room for choice' (8) and explains educational choice as 'what one can do' (168). We claim that these restrictions are weaker in Norway than most countries and that the Norwegian context seems especially suitable for a study on choice in the educational field for several reasons. First, Norway's population enjoys unfettered access to an open, universal system of higher education (Reizel 2011). Norwegian students enjoy the same educational options due to free tuition, generous student scholarships and state-sponsored loans for living expenses.

Second, unlike countries like the USA (Khan 2011: 7) and UK (Reay et al. 2005: 10), the Norwegian tertiary system lacks an upper tier of elite institutions which draw academically gifted and wealthy students away from middle- and lower-tier institutions. In order to secure an elite position in Norway, it is far more important what educational field one has graduated in than from what institution (Gulbrandsen et al. 2002: 58). Furthermore, strict legislation governing private schooling at the primary and secondary level, precludes the establishment of elite institutions grooming for elite careers. With the exception of a large, private business school, Norwegian higher education institutions are state owned (Ahola et al. 2014). Admission is centralized, and grade-point average in upper-secondary school is the only sorting criteria when the number of applicants exceeds the number of available spots. The application process involves no essays or letters of intent.

Finally, Norway's generous social insurance scheme and safety net mitigate labour market risks, even for graduates who make the wrong choices in postsecondary education. The relatively egalitarian character of the Norwegian educational system, embedded in a

social democratic society, makes it an ideal context in which to study choice of field in higher education.

Theorizing Choice of Educational Field

At present, two main explanatory frameworks dominate the literature on the intergenerational reproduction of educational attainment: the rational action approach inspired by Boudon (1974) and cultural reproduction theory inspired by Bourdieu (e.g. Bourdieu and Passeron 1990). We develop a perspective integrating status group formations based on educational fields with elements of both these theories and the micro-class approach.

The rational action approach departs from the framework that holds that the rewards and risks of educational choices depend on parents' social position (Breen and Goldthorpe 1997). Boudon (1974) distinguishes between primary and secondary effects of social origin. Primary effects are caused by differences in academic ability between social classes, which, in turn, affect educational attainment. Secondary effects are caused by the varying costs and benefits of educational choices for social classes. A crucial assumption in the rational choice perspective is that the main objective of educational decisions is to avoid social demotion (Breen and Goldthorpe 1997). If this is the universal motivation for educational choices, children of highly educated parents derive greater benefits from pursuing lengthy higher education. Students from working-class backgrounds accomplish the goal of avoiding downward social mobility at lower educational levels than the children of, for example, lawyers and doctors. It, therefore, is rational for upper-class children to pursue more education than working-class children.

While writing in the same theoretical framework, Erikson and Jonsson (1996) put more emphasis on cultural factors than Breen and Goldthorpe do, and highlight the importance of factors like middle class parents' ability to help with school work, to convince their children that higher education is not that difficult, and to instil in one's children an

appreciation of schooling and education. The latter point may be seen as what economists in the Beckerian tradition call the consumption value of education (Lazear 1977, Jacob, McCall & Stange 2011), even though this concept often refer to non-academic institutional characteristics like student activities, sports, and dormitories.

Cultural reproduction theory claims that the educational system expects and rewards cultural capital and thus reproduces social inequalities in educational achievement as cultural capital is unevenly distributed by social background (Bourdieu and Passeron 1990; Sullivan 2001). Individuals are selected into tertiary education based on their socialized dispositions, which ultimately leads to inequalities in educational attainment based on parental educational attainment (Bourdieu and Passeron 1990). Children's upbringing may equip them with different kinds of capital depending on their parents' educational fields and shape their educational preferences (van de Werfhorst, Sullivan and Cheung 2003). Bourdieusian theory also assumes that individuals' positions in the social structure shape their preferences in lifestyle and educational field (Reay, David and Ball 2005). Here, socialization and the development of habitus are important components. As part of a middle class habitus is a sense of entitlement (Kahn 2011) and an ease with which middle class students encounter higher education (Reay et al. 2005). Bourdieu compares such ease with being 'like a fish in water' (Bourdieu & Waquant 1992: 127). Upper and middle class students take for granted the pursuit of higher education, and such ease and taken-for-grantedness, may be even more apparent in students following in their parents' footsteps.

Drawing on Bourdieu's work, Hodkinson and Sparkes (1997) propose a model of career decision making in which parents' education may affect children's choice of educational field by restricting their 'horizons for action'. The horizons for action narrow the range of possibilities and students' perceptions of what is possible, available or appropriate. No-one considers the whole range of possible opportunities in education or the labour market

(Hodkinson and Sparkes 1997: 35). Parents' educational fields likely affect children's horizons for action and may exclude various options from any consideration.

Here, we assume that both the rational action approach and Bourdieusan theory can contribute to explaining students' choice of educational field. Students may prefer to maintain their parents' social position, but in what fields they seek to obtain that position may well be formed by their upbringing and influenced by their parents' educational fields. For instance, a nurse's child may be motivated to avoid social demotion but seek to maintain her parent's social position in the medical field. We believe that status group formation based on educational fields may be an important factor in such reproductive processes.

Commonalities to our perspective can be found in the micro-class theory of Weeden and Grusky (2005), developed further by Jonsson et al. (2009). Jonsson et al. (2009: 986) specify four mechanisms distinguished by the type of resources that facilitate social reproduction. First, children acquire the same skills (human capital) as their parents, which may increase their relative abilities in their parents' educational fields. If we assume that students tend to choose educational fields in which they are relatively able, this pattern may provide a reason for expecting students to be more inclined to choose the same educational fields as their parents.[2]

Second, children grow up in a culture marked by their parents' occupation and class location and, through it, may acquire a taste for their parents' education and occupations. The abovementioned sense of entitlement and ease may also be even stronger in the parents' educational field. The culture in which children grow up is also influenced by the parents' social network (which also may affect children's horizons for action), and this social network may constitute a resource in its own right when it comes to securing jobs, often in occupations similar to the parents'. Finally, parents' economic resources may play important roles in children's educational choices, both shaping their taste for pecuniary rewards and making

different educational choices possible. Economic resources may also be non-fluid, such as a dentist's practice, and may increase the probability of choosing dentist education. Jonsson et al. (2009: 983) report empirical support for their theoretical claims and find that the strength of the reproductive tendencies varies considerably among occupations.

We argue that these reproductive tendencies at the occupational level can be understood in terms of Max Weber's concept of status groups, which also applies to educational status groups. Weber (1947: 424) defines status groups as social groups with a common social status and prestige based on a way of life, education or occupation. Education thus is an important component of status group formation and can even be seen as a 'pseudo-ethnicity' (Collins 1979: 72). Children growing up in a status group environment likely internalize group-specific values, identities and codes of honour, including group-specific rankings of educational fields. Rational action models of social reproduction assume that children tend to choose educational fields to at least maintain their parents' social position. Within a social environment with status group features, this relative risk aversion hypothesis may lead to an expectation that children tend to choose educational fields that ensure membership in their parents' status group. Choosing the same educational field as one's parents also helps children reach a similar class position as their parents (Van de Werfhorst and Luijkx 2010: 710). In addition, if members of a status grouping with similar education share a group-specific culture that also dominates the educational institutions they attend, one might expect that students who grow up in this culture have relative advantages in the competition for good grades in the same or similar educational fields as their parents'. In part, the reason for such an expectation may be found in the sense of entitlement and ease that may characterise students with parents with similar education.

In the empirical world, ideal types like status group are blurry. The degree of education-based status group formation likely varies among educational groups, and we

expect that the tendency to reproduce parents' educational fields increases with the degree of status group formation. Status group features probably are most apparent in educational groups that also share the other two status group characteristics (lifestyle and occupation). In some cases, a single educational category may form a status group; classical professions (e.g. lawyers, physicians and graduate engineers) are examples of such distinct group identities (see, e.g., Collins 1979: 137). Other educational groups do not form single status groupings but may be part of status group formations that overlap with other educational fields.

Accordingly, we expect that professions may constitute important 'pockets of micro class rigidity' (Jonsson et al. 2009: 983). Some high-status professions exhibit crucial elements of identity formation based on both educational content and the destined (and, in some cases, certified) occupations. We thus expect:

HYPOTHESIS 1: A higher degree of self-recruitment across generations in professions than more general educational fields

One source of the considerable variability in the process of status group formation across professions may be differences in social status and prestige. Doctors and lawyers have higher social status than teachers (Helland et al. 2016), and such differences may result in differences in the degree of intergenerational educational reproduction. Hence, we expect:

HYPOTHESIS 2: A higher degree of self-recruitment across generations in high-status professions than lower-status professions

An important difference between high- and low-status professions is the length of study required. The importance of years of schooling may also create differences among

educational groups that are not professions. We expect that the duration of an educational program may strengthen the tendency to develop a common culture and identity. Status group formation in general may be more intense among those who have completed masters' degrees (and their children) than among those who have completed bachelors' degrees.

HYPOTHESIS 3: A higher degree of self-recruitment across generations into masters'-level education than bachelors'-level education

In many cases, these three dimensions—professional or general education, social prestige and study length—overlap, especially the latter two dimensions. However, these dimensions are analytically distinguishable.

Even though we may find a tendency among students to choose the same educational field as their parents, there is little reason to expect that this correlation is anything near complete. Most students do not follow their parents' footsteps precisely; the question is how far the apple falls from the tree. The status group perspective may be relevant to answering this question as well. Most educational groups do not constitute a single status group, but status group formations may encompass several similar educational groups. In general, educational groups close in content or occupation may also belong to the same status group. We, therefore, expect that children who choose differently than their parents nevertheless tend to select educational fields perceived to be close to their parents'.

One dimension of closeness is the content of educational fields. For example, mathematics forms a central part of the curriculum for both engineering and the natural sciences. An understanding of closeness based on similar content recalls van de Werfhorst's (2001) argument that different educational fields equip students with various amounts of four kinds of resources: cultural, economic, technical and communicative. Van de Werfhorst's

distinction between economic and cultural resources resembles Bourdieu's (1986) axis ranging from economic to cultural capital. However, these dimensions are not the only possible ones. For instance, if one puts more emphasis on the technical resources dimension (van de Werfhorst 2001) or the hard–soft distinction (Biglan 1973), those trained in mathematics and natural science clearly are much closer to engineers than any other group. If the categories of economic and cultural capital assume greater importance, then engineering is closer to business administration. The organization of the disciplines in university faculties may also play a role in status group formation, and students in social sciences faculties may have perceived commonalities and shared academic identities.

Another dimension in the perceived closeness of educational categories is whether they lead to similar occupational sectors and industries. Educational groups that find employment in the same sector or industry may be culturally closer to one another and develop status group features. This pattern could be facilitated by any of the mechanisms described in the micro-class approach (Weeden and Grusky 2005). For instance, hospital staff may have common cultural features regardless of whether they are physicians and nurses, as do those employed in education.

Closeness between education in content or labour market position thus may lead to the development of a common culture and identity that, to some extent, clusters different educational groups with common status group features. Common status group features may, in turn, affect the choice of educational field through the mechanisms described. Such status group formation may influence students' horizons for action so that if they do not wish to choose the same educational field as their parents, they primarily consider fields close to those of their parents. Similarly, parents' educational fields may influence children's preferences and values so that children who do not choose the same fields as their parents prefer those

close to their parents'. Parents' educational fields may also equip children with skills that give them comparative advantages in fields close to those of their parents.

HYPOTHESIS 4: Students choose and pursue educational fields close to their parents' educational fields.

Operationalization of closeness

Our classification of educational fields takes into account both horizontal differentiations across fields and vertical differentiations (in the degree of status group formation, prestige and average income) between educational areas within each field. Based on these considerations, we operationalize the following six fields of closeness:

- Health (masters' degrees: 'physicians', 'dentists' and 'other health care educations'; bachelors' degrees: 'nursing' and 'other health care studies')
- Education (masters' degrees: 'education science'; bachelors' degrees: 'teaching'; 'vocational teachers', 'pre-school teachers')
- Social sciences (masters' degrees: 'psychology', 'economics' and 'other social sciences'; bachelors' degrees: 'social sciences'; 'social work')
- Arts and humanities (masters' degrees: 'theology' and 'arts and humanities'; bachelors' degrees: 'performing arts and art teacher' and 'arts and humanities')
- Business administration (masters' degrees: 'law' and 'business administration'; bachelors' degree: 'business administration')
- Natural sciences and technology (masters' degrees: 'graduate engineering' and 'natural sciences'; bachelors' degrees: 'engineering and technicians' and 'natural sciences')

We group educational fields as close based on similarities in content, although we recognize that other sources of status group formation (e.g. occupational characteristics) may be equally important. This grouping is hypothetical, and some educational programs could be placed in more than one field. Law could be placed in both the social sciences and business administration, and graduate engineering in both the natural sciences and business administration (historically, many graduate engineers take management positions in major companies). Finally, psychology is grouped with the social sciences as it is taught in the social sciences faculties at Norwegian universities; however, it could also be grouped with the health fields. Within these larger fields of closeness, we expect differences in the strength of reproduction tendencies due to relative risk aversion. The children of nurses may choose any educational field within the health domain, whereas the children of physicians and dentists have to choose the same fields as their parents to avoid social demotion.

Data and methods

In this study, we use Norwegian register data on all individuals born from 1955 to 1980 who have attained college- or university-level degrees. The individual-level data covering the entire population of Norway are derived from national registers on demographics, education, and tax and income. To sharpen the focus on tertiary educational fields, we exclude all those who had not completed tertiary education by the end of 2009.

Independent variables

The central independent variable is parents' fields of education at the tertiary level. We divide educational fields into the 25 categories mentioned. In addition, we include two categories at the bachelors' level ('police, military etc.' and 'other BA'). We apply the same classification scheme to the parents' and children's fields of education. As described in the following, the various combinations of these two variables are used to classify the degree of

intergenerational similarity in educational choices. See Table A3 in online supplements for descriptive statistics of these variables.

Parental income is measured as Consumer Price Index-adjusted individual labour income. To operationalize parental income, we use the sum of the mother's and father's average income during the years when the child was 10–18 years old. We then divide these averages into deciles according to the child's birth year. Averages over several years have been shown to be a better measure to demonstrate long-term effects on income from parental background (Mazumbder 2005). In Norway, combining the mother's and the father's income has been shown to be a better measure of family economic resources (Hansen 2010). In addition, the analysis includes controls for sex and for three-year birth cohort dummies to examine trends over time and dummies for the level of centrality of the municipality the students lived in at age 16.

Dependent variable

To examine our hypotheses, the dependent variable is constructed from the education of both the parents and the children. In our operationalization, we categorize the outcome variable according to the following fourfold scheme: (1) SAME, choosing the same educational field as one parent; (2) CLOSE, choosing an educational field similar to that of at least one parent; (3) DIFFERENT, choosing an entirely different educational field than either parent; and lastly, (4) LOW ORIGIN, choosing any field of higher education when neither parent has higher education.

<Table 1>

Methods

The dependent variable has multiple categories, so we employ multinomial logit regression (Long 1997). Such models offer advantages in assessing both relative and absolute effect sizes. Very small categories tend to exaggerate relative risks, so it is essential to determine the size of the absolute effects, even if the relative effect sizes remain the study's primary focus. Odds ratios are necessary to compare the strength of the effects across subgroups that vary in size as odds ratios do not depend on the size of the group categories.

Issues regarding estimation have been raised in treatments of non-linear models such as ours (Allison 1999; Mood 2009). The so-called scaling problems in the residuals of the outcome variables could make comparing coefficients across groups less straightforward. Bias may occur in the included independent variables, even if an important omitted variable is correlated only with the outcome of interest.[3] One way to address this issue is to estimate the average marginal effects, so we include such estimates in the appendices. The average marginal effects do not deviate from the standard estimated marginal effects, suggesting that the scaling problem is not a major issue.[4]

Results

Recruitment to educational fields similar to the parents' fields

In the preceding discussion, we hypothesize that children have a tendency to choose the same educational fields as their parents. We also expect this tendency to be manifested more strongly in professional fields of education than in general education fields and to be stronger among the children of highly educated parents. In figures 1 and 2, we present the associations for parent–child pairs in identical, close and distant fields of study. The last category is the reference category in the multinomial regression models. In the online supplements, we also report separate models according to gender in Table A1. Table A2 additionally report the predictive margins (MEM) of choosing same and close education as the parents, divided by

the different gender combinations of the parents and their children. In the online supplements we also report corresponding graphs to Figure 1 and 2, only with and without controls for parents' income (See Figure A3 and A4).

<Figure 1>

In Figure 1, we report the predictive margins centred on the mean of every variable in the models. The margins predict the likelihood that individuals choose similar, close or different educational fields than their parents. Figure 2 presents the associated odds ratios, with preschool education and low origin as the reference categories. Both figures display similar models as in Table A1. In the online supplements Figure A1 reports the estimated average marginal effects using the same baseline categories as in Figure 2.[5] In both figures 1 and 2, there is considerable variation within and across educational fields. When the subfield has higher social status, cross-generational matching in fields of study is more likely, as measured by both within-field likelihood (figure 1) and odds ratios (figure 2). These probabilities and odds ratios also increase with the degree of specialization and the prestige of an academic and professional education.

For example, at the lowest educational level in the humanities, 4.5 per cent of those with bachelors' degrees complete the same course of study as their parents. In this group, 8.7 per cent of the children have either the same or similar educational field as their parents. This likelihood increases with the level of education. Among masters'-level graduates in the humanities, 13.4 per cent have the same or similar education as their parents. In the humanities, theology has the highest degree of cross-generational matching: 15.9 per cent of individuals with masters' or higher-level degrees in theology have parents with similar education. The status group model explains this trend as theology is more closely linked to a professional occupation than the other humanities. The odds ratios and the average marginal effects confirm these patterns. The odds of choosing the same humanities field as one's

parents, ranges from 10 to 25 compared to the children of parents with no tertiary education and compared to those with a preschool teacher education. The gradient is perhaps most noteworthy within the field of health, which includes some of the most specialized and prestigious elite professions. Among those with bachelors' degrees in health care, 10.3 per cent chose similar fields as their parents. Within the health field, this trend increases sharply. Among medical doctors, 27 per cent percent have parents with the same or similar field of education. The relative risks (odds ratios) in Figure 2 confirm this trend. Compared to people with preschool teacher education and low origin the odds of choosing the same educational field rise from 3 to 39 with increasing prestige of the health professions.

The field of education stands out as an exception to this general pattern. At the masters' level in education, children have a lower tendency to select the same field as their parents. This deviation has several possible explanations. In this case, we suggest that profession trumps duration of education. In the profession of teaching the overlap between education and occupation is considerable, and teaching has a long history in which status group formation may have taken place, whereas a masters' degree in education (pedagogy) does not automatically qualify the holder for the teaching profession. The university discipline of pedagogy also has a considerably shorter history and did not exist before 1938. Consequently, many parents of older individuals could not have obtained masters' degrees in education. The large number of masters' graduates in pedagogy with parents educated in fields close is consistent with this explanation.

<Figure 2>

The odds ratios, however, are only a small part of the picture, and can be somewhat misleading as they may be seen to exaggerate the differences when the probabilities are low. The odds ratio that the children of dentists and medical doctors choose the same educational field is nearly twice that for any other educational group. In dentistry, the high odds ratio is

partly due to the relatively low number of dentists, but in medicine, the number of students is not especially low compared to other educational fields.

There is limited evidence of interaction effects with gender. Appendix Table A1 shows the models run separately for men and women. The patterns are very similar to those in the pooled model, except for natural science and engineering. Women tend to have a somewhat stronger tendency to choose the same as the parents. Table A2, which also breaks down the numbers by the gender of the parents, shows that this tendency is mainly due to father and daughter combinations in the male dominated STEM fields. In the more female dominated fields of education and health educations at the BA-level, the mother and son combination are more prominent. Overall the reproductive tendencies are similar for men and women, but in general (with the noted exceptions) fathers seem to have a stronger impact of the children educational choices, regardless of their gender.

Discussion

In summary, the results largely confirm the expectations stated in the hypotheses.

- There is considerable self-recruitment in nearly all fields of education.
- Self-recruitment is strongest when parents and children hold prestigious professional degrees at the masters' level.
- Students who choose different educational fields than their parents tend to choose fields close to those of their parents.

In other words, across all educational fields, there is a marked tendency for students to choose the same or similar fields as their parents. The findings provide evidence that even in Norway, the choice of postsecondary educational field is an important channel for intergenerational class reproduction. This reproduction is strongest when parents have a professional education at the masters' level (e.g. dentistry, medicine and law). Moreover, even when children do not chart precisely the same course as their parents, they often choose a

field of study close to their parents'. The strength of this tendency also varies among educational levels and fields.

To make sense of these findings, we propose what we label a status group perspective that combines multiple theoretical frameworks. Indeed, it is likely that many or all of the mechanisms described by Jonsson et al. (2009: 986) contribute in some way to the observed patterns. Parents' educational field may equip their children with education-specific skills, cultural resources, social networks and economic resources. The largest odds ratio is for children of dentists to become dentists themselves, and economic resources, in this case, the non-fluid form of an inheritable dentist practice, provide one explanation for this pattern. The greater investments in higher education made by the children of professional parents accords with the implications of the relative risk aversion hypothesis. This model predicts that reproductive tendencies are strongest when parents have professional training and high-status credentials in fields such as medicine and law.

These educational fields which exhibit exceptionally high degrees of intergenerational reproduction are also the fields where the practitioners come the closest to forming ideal-type status groups—typically the classical professions. The cultural reproduction model points towards an explanation of why the children of physicians and lawyers chose careers in medicine and law and why the children of clergy select training in theology even though they all could earn more money by pursuing masters' in business administration and working in the business sector. The explanation for the significant reproductive tendency in these educational fields should be sought elsewhere than the reproduction of a one-dimensional hierarchical understanding of status, as several previous studies (e.g. Hällsten 2010; Thomsen et al. 2017) do. Hierarchies of prestige, power and wealth are of course important explanations of the patterns, but educational choice is also about cultural factors like values and identity. The strong reproductive tendencies in the humanities, theology and art-related

fields underline the impact of parental field of study on children's socialized preferences, and indicates that what is highly appreciated and valued vary between status groups. In the Norwegian labour market an artist education, a degree in humanities or in theology all give small pecuniary rewards. Children growing up in a status group environment likely internalize group-specific values, identities and codes of honour. This internalisation also includes group-specific rankings of educational fields, which narrow the horizons for action and make some educational choices obvious and place other fields off the map.

Our findings have implications exceeding educational mobility and the link between parental and children's major. Most descriptions of status and status groups emphasize similar social prestige, common culture, similar lifestyles and consumption patterns, which entails the feeling of belonging to the same group and group based identity formation. Internalized status group-specific values, identities and codes of honour, may have consequences well beyond choice of educational field. The importance of educational fields for status group formation may also broaden our understanding of social class and stratification, by putting emphasis on horizontal differences within the highly educated middle classes.

By studying reproductive tendencies in both the horizontal dimension separating educational fields and the vertical dimensions of social prestige, we take the first step towards answering and suggesting an explanatory framework for the question of where students go in post-secondary education. We, however, have not identified the various causal mechanisms leading to such results. Why do some professions seem to constitute pockets of extreme micro-class rigidity? Do cognitive skills and grades in secondary school affect these patterns? What role do non-fluid economic resources play in the processes of social reproduction? These questions are challenges for future research.

Notes

[1] All these studies, regardless of their position on whether educational attainment has been equalized, show that considerable social differences persist.

[2] Such comparative advantages in subject abilities may also have inheritable (genetic) components. We do, however, consider this to be only part of the explanation. We separate 27 different educational fields, and most of them require several different skills (which each have inheritable components). Mathematical skills e.g. probably have considerable inheritable components, but such skills are relevant for several of the educational fields (economics, medicine, engineering, natural sciences etc.), and it may be something other than genetics that decides which of these fields one chooses.

[3] In our case, however, a quite similar pattern appears in simple cross-tabulations.

[4] An alternative approach to deal with rescaling is proposed by Breen, Karlson and Holm (2013). We have also applied this method and provide estimates in the online supplement Table A5.

[5] In some circumstances, estimates from nonlinear models can suffer a rescaling problem when comparing highly heterogeneous groups, such as birth cohorts and other subgroups (see, e.g., Mood 2009). However, in this study, the regular *marginal effects at the means* (MEM) and the *average marginal effects* (AME) estimates provide very similar estimates, with only insignificant evidence indicating problematic rescaling of coefficients in the analyses.

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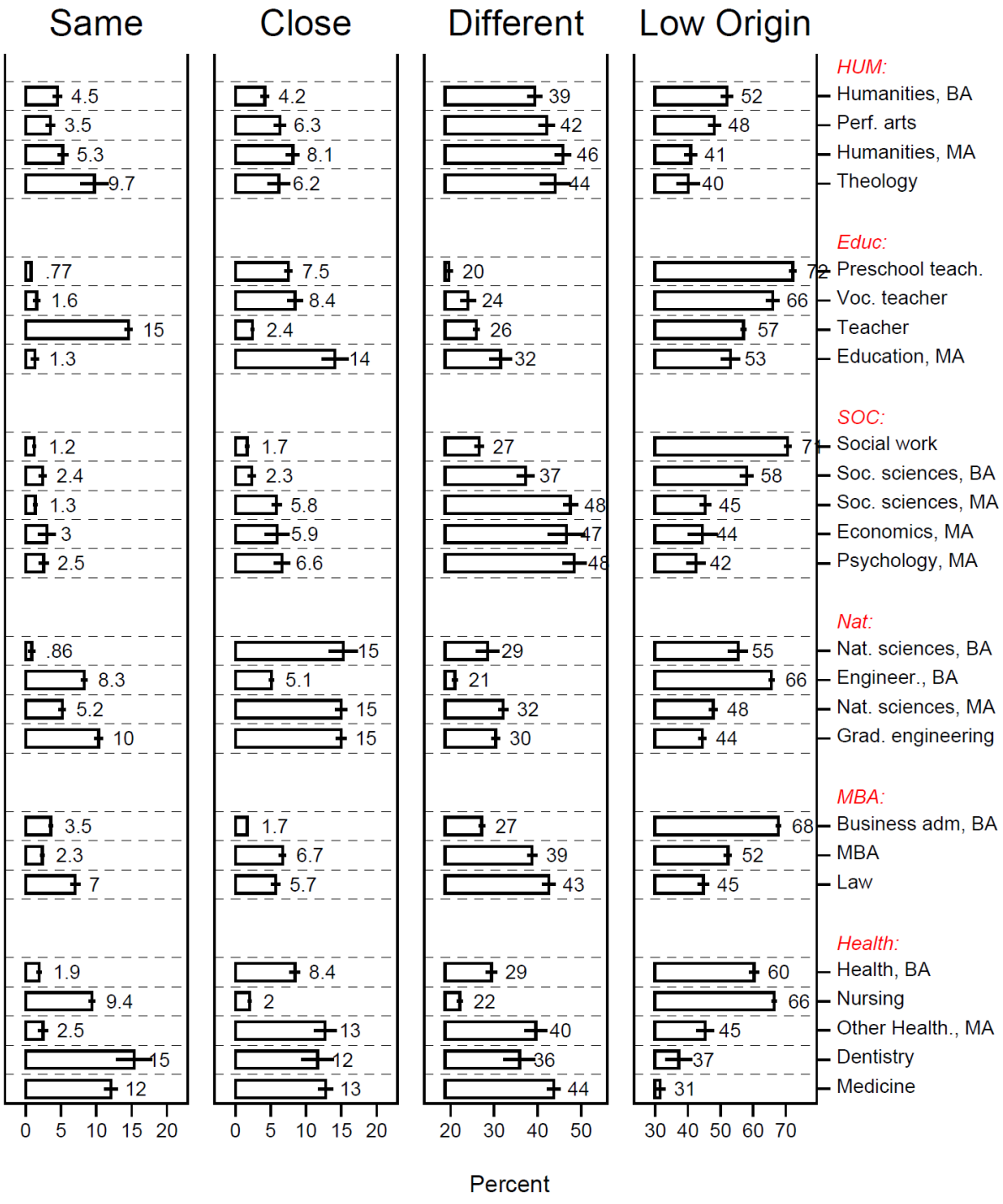
Tables:

Table 1. Descriptive Statistics. Analytical sample with casewise deletion

	mean	sd	min	max
Similarity of Educational fields				
Same Educ	0.068	0.252	0	1
Close Educ	0.065	0.247	0	1
Different Educ	0.299	0.458	0	1
Low Origin	0.568	0.495	0	1
Controls				
Sex (women=1, men=0)	0.582	0.493	0	1
Parents' income decile (ref=1)	6.241	2.860	1	10
Birth Year	1969.4	6.9	1955	1980
Centrality of Residency				
Least Central Regions	0.122	0.327	0	1
Less central Regions	0.083	0.276	0	1
Somewhat Central Regions	0.195	0.397	0	1
Central Regions	0.381	0.486	0	1
Most Central Regions	0.209	0.406	0	1
Observations	422538			

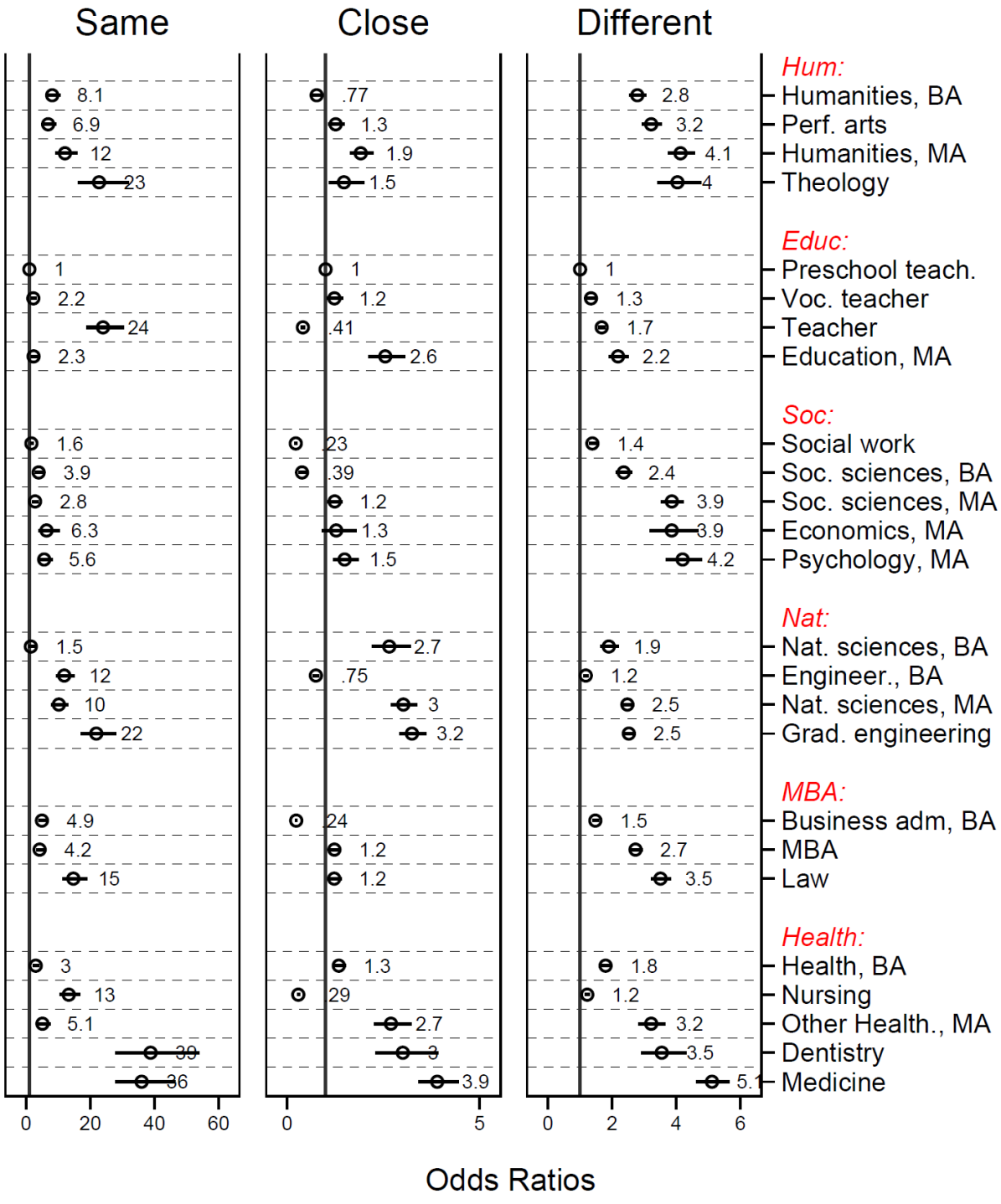
Figure legends:

Figure 1: Predictive margins at means of variables: Likelihood of choosing educational fields with varying degrees of similarity to parents' educational fields



* The model controls for parents' income deciles, birth years, sex, and centrality of residency. See Table A1 in online supplements. Ref.cat: average birth year, average gender and average deciles. 99.9% confidence intervals are on top of the bars.

Figure 2: Odds ratios of choosing similar educational fields as parents' educational fields



*Ref.cat: preschool educational field, outcome = low origin, birth year = 1955 and gender = male. The model controls for parents' income deciles, birth years, sex, centrality of residency. See Table A1 in online supplements. The 99.9% confidence intervals are reported along with the odds ratios. The AME estimates are nearly identical to the effect sizes based on the MEM. The AMEs are included in the appendix (figure A1) as some are concerned with the possibility of *a discernible rescaling problem* in logit models (Mood 2009). See also Table A2, which shows the difference between the MEM and the AME effect sizes.

ONLINE SUPPLEMENT FOR

"How do parents' educational fields affect the choice of educational field?"

Contents <zaq;3>

FIGURES

TABLES

Figure A1: *Estimated average marginal effects (AME) based on pooled gender models in Table A1. Compares with Figure II.*

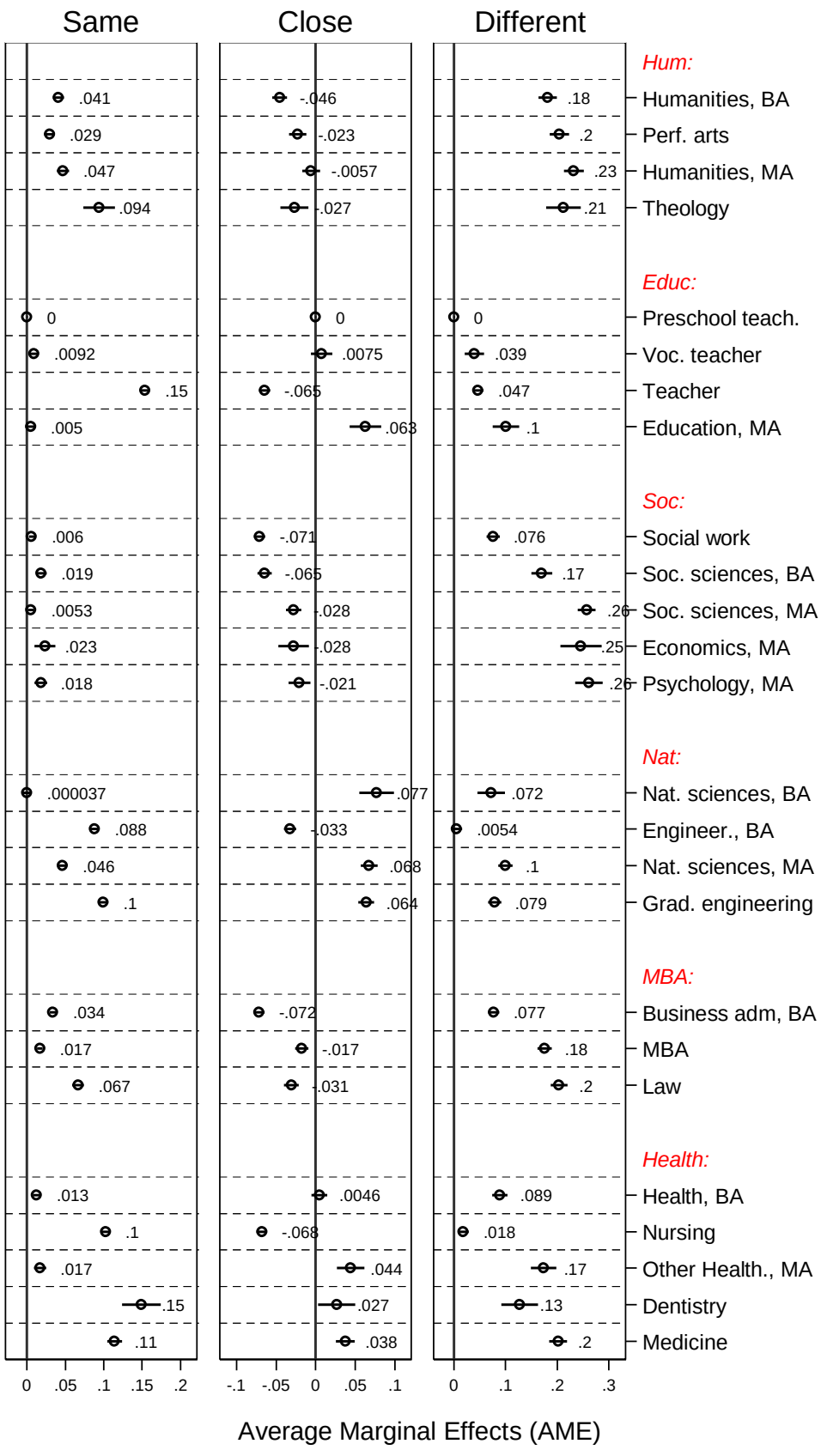
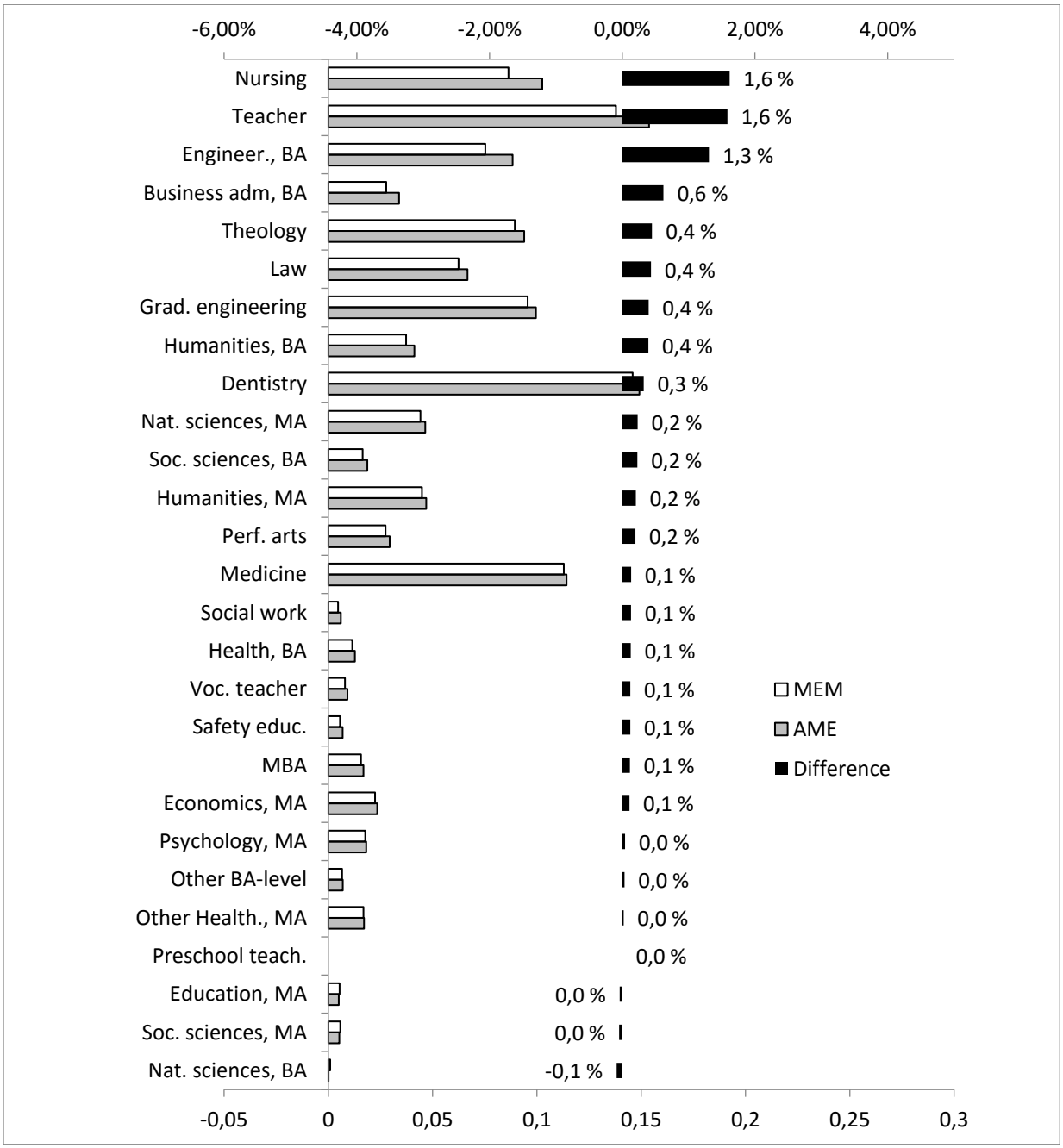


Figure A2: *Differences in the MEM and the AME effect sizes.* Sorted by the size of differences. See also Table A4 for summary statistics of the difference between MEM and AME coefficients.



Differences (black bars) are based on the estimated marginal effects models in Table A1. Examples for the same educational field as parents' educational field.

Figure A3: *The bars compare with Figure I and the models in Table A1, only comparing with (Base) and without control for parental income (Control).*

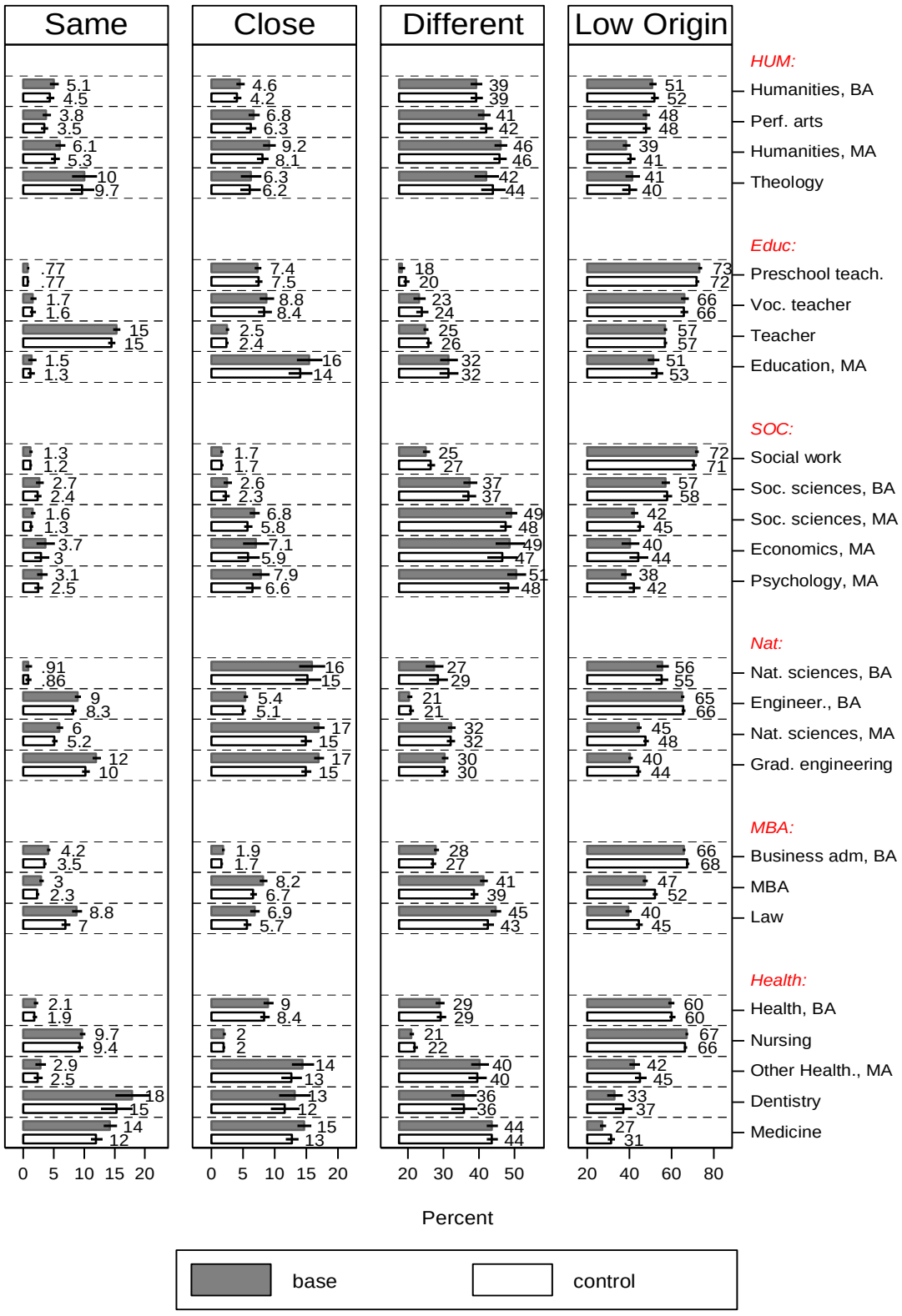


Figure A4: *The dots compare with Figure II and the models in Table A1, only comparing with (Base) and without control for parental income (Control).*

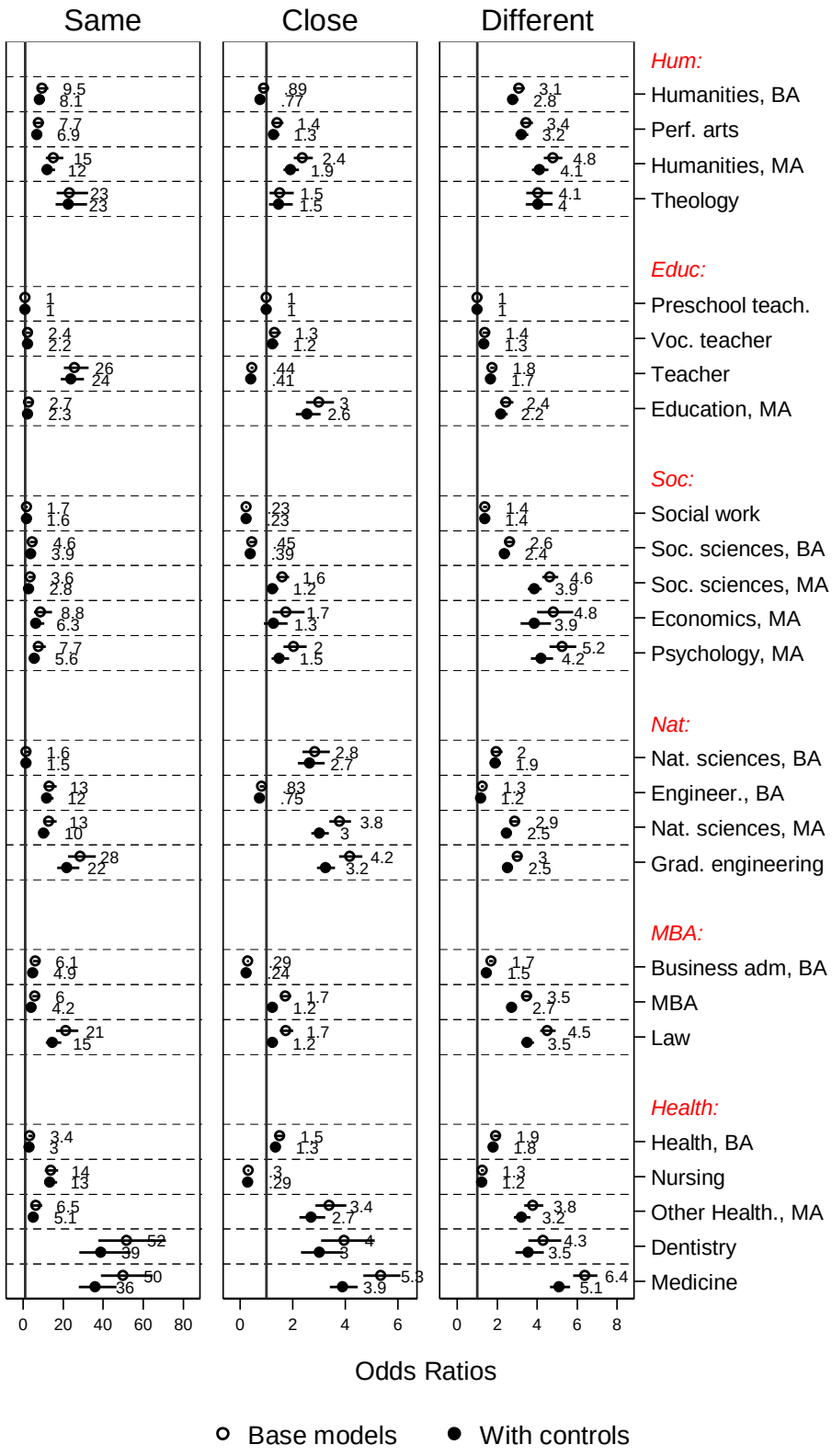


Table A1: *Multinomial regression models: similarity of education to parents dependent on educational fields attained*

	All						Men						Women					
	Same		Close		Different HE		Same		Close		Different HE		Same		Close		Different HE	
Humanities																		
Humanities, BA	2.09***	(0.09)	-0.26***	(0.05)	1.02***	(0.03)	1.80***	(0.25)	-0.23	(0.12)	0.98***	(0.07)	2.14***	(0.09)	-0.34***	(0.07)	1.01***	(0.03)
Perf. arts	1.92***	(0.09)	0.23***	(0.05)	1.17***	(0.03)	1.74***	(0.26)	0.28*	(0.11)	1.12***	(0.08)	1.91***	(0.10)	0.14*	(0.06)	1.15***	(0.03)
Humanities, MA	2.49***	(0.09)	0.65***	(0.05)	1.42***	(0.03)	2.20***	(0.25)	0.50***	(0.11)	1.30***	(0.07)	2.54***	(0.10)	0.67***	(0.06)	1.45***	(0.04)
Theology	3.12***	(0.10)	0.39***	(0.09)	1.40***	(0.05)	2.92***	(0.26)	0.31*	(0.15)	1.30***	(0.09)	3.07***	(0.14)	0.33*	(0.14)	1.42***	(0.07)
Educ																		
Preschool teach.	*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*	
Voc. teacher	0.80***	(0.12)	0.21***	(0.05)	0.29***	(0.03)	0.57*	(0.28)	0.10	(0.11)	0.12	(0.08)	0.81***	(0.15)	0.20**	(0.06)	0.36***	(0.04)
Teacher	3.18***	(0.07)	-0.89***	(0.04)	0.51***	(0.02)	3.00***	(0.24)	-0.93***	(0.10)	0.47***	(0.07)	3.16***	(0.08)	-0.93***	(0.05)	0.50***	(0.02)
Education, MA	0.84***	(0.16)	0.94***	(0.06)	0.78***	(0.04)	0.71	(0.37)	0.83***	(0.14)	0.64***	(0.11)	0.83***	(0.18)	0.94***	(0.06)	0.80***	(0.05)
Social Science																		
Social work	0.49***	(0.09)	-1.49***	(0.06)	0.32***	(0.02)	0.58*	(0.27)	-1.54***	(0.15)	0.36***	(0.07)	0.42***	(0.10)	-1.50***	(0.06)	0.31***	(0.03)
Soc. sciences, BA	1.36***	(0.10)	-0.95***	(0.08)	0.86***	(0.03)	1.22***	(0.26)	-1.06***	(0.15)	0.75***	(0.08)	1.29***	(0.13)	-0.95***	(0.10)	0.88***	(0.04)
Soc. sciences, MA	1.02***	(0.10)	0.21***	(0.05)	1.35***	(0.03)	0.91***	(0.26)	0.11	(0.11)	1.29***	(0.07)	0.93***	(0.13)	0.20***	(0.06)	1.34***	(0.03)
Economics, MA	1.85***	(0.15)	0.24*	(0.11)	1.35***	(0.06)	1.64***	(0.29)	0.02	(0.16)	1.31***	(0.10)	1.77***	(0.24)	0.39*	(0.16)	1.30***	(0.09)
Psychology, MA	1.73***	(0.12)	0.40***	(0.07)	1.43***	(0.04)	1.58***	(0.28)	0.28	(0.14)	1.27***	(0.09)	1.69***	(0.14)	0.41***	(0.08)	1.48***	(0.05)
Natural Science																		
Nat. sciences, BA	0.37	(0.19)	0.98***	(0.06)	0.64***	(0.05)	-0.12	(0.34)	0.80***	(0.11)	0.52***	(0.08)	0.82**	(0.28)	1.08***	(0.09)	0.68***	(0.08)
Engineer., BA	2.47***	(0.07)	-0.29***	(0.03)	0.16***	(0.02)	2.16***	(0.24)	-0.48***	(0.09)	0.07	(0.06)	2.72***	(0.08)	-0.06	(0.05)	0.21***	(0.03)
Nat. sciences, MA	2.32***	(0.08)	1.11***	(0.03)	0.91***	(0.02)	1.97***	(0.24)	0.91***	(0.09)	0.82***	(0.07)	2.50***	(0.09)	1.24***	(0.04)	0.91***	(0.04)
Grad. engineering	3.08***	(0.07)	1.18***	(0.03)	0.92***	(0.02)	2.69***	(0.24)	0.99***	(0.09)	0.80***	(0.07)	3.50***	(0.08)	1.37***	(0.05)	1.08***	(0.04)
MBA																		
Business adm, BA	1.59***	(0.08)	-1.44***	(0.04)	0.39***	(0.02)	1.35***	(0.24)	-1.48***	(0.10)	0.31***	(0.06)	1.59***	(0.08)	-1.52***	(0.06)	0.39***	(0.02)
MBA	1.43***	(0.08)	0.21***	(0.04)	1.00***	(0.02)	1.11***	(0.24)	0.08	(0.09)	0.88***	(0.07)	1.57***	(0.10)	0.20***	(0.05)	1.07***	(0.03)
Law	2.69***	(0.08)	0.20***	(0.05)	1.25***	(0.03)	2.52***	(0.24)	0.01	(0.11)	1.18***	(0.07)	2.61***	(0.09)	0.28***	(0.06)	1.26***	(0.03)
Health																		
Health, BA	1.09***	(0.09)	0.30***	(0.04)	0.59***	(0.03)	0.84**	(0.27)	0.28*	(0.11)	0.54***	(0.08)	1.12***	(0.10)	0.27***	(0.04)	0.58***	(0.03)
Nursing	2.59***	(0.07)	-1.23***	(0.04)	0.20***	(0.02)	2.44***	(0.24)	-1.17***	(0.13)	0.21**	(0.07)	2.59***	(0.08)	-1.25***	(0.04)	0.19***	(0.02)
Other Health., MA	1.63***	(0.12)	0.99***	(0.05)	1.17***	(0.04)	2.08***	(0.28)	0.96***	(0.13)	0.98***	(0.10)	1.31***	(0.15)	0.97***	(0.06)	1.20***	(0.04)
Dentistry	3.66***	(0.10)	1.10***	(0.08)	1.27***	(0.06)	3.71***	(0.26)	0.98***	(0.15)	1.22***	(0.11)	3.38***	(0.13)	1.10***	(0.10)	1.24***	(0.08)
Medicine	3.58***	(0.08)	1.36***	(0.04)	1.63***	(0.03)	3.43***	(0.24)	1.32***	(0.10)	1.50***	(0.07)	3.50***	(0.09)	1.29***	(0.05)	1.69***	(0.04)
Other																		
Safety educ.	0.64***	(0.12)	-2.85***	(0.18)	0.59***	(0.03)	0.34	(0.26)	-3.04***	(0.22)	0.49***	(0.07)	0.80***	(0.21)	-2.67***	(0.36)	0.58***	(0.06)
Other BA-level	0.92***	(0.11)	-2.14***	(0.13)	1.13***	(0.03)	0.67*	(0.27)	-2.40***	(0.22)	1.01***	(0.07)	0.95***	(0.14)	-2.03***	(0.17)	1.16***	(0.04)
Controls																		
Birth Year Intervals																		
55-57	*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*	
58-60	0.14***	(0.04)	0.13**	(0.04)	0.04	(0.02)	0.17**	(0.05)	0.12*	(0.05)	0.13***	(0.03)	0.12*	(0.06)	0.15*	(0.06)	-0.05	(0.03)
61-63	0.33***	(0.04)	0.21***	(0.04)	0.12***	(0.02)	0.39***	(0.05)	0.26***	(0.05)	0.27***	(0.03)	0.28***	(0.05)	0.17**	(0.06)	-0.01	(0.03)
64-66	0.39***	(0.04)	0.32***	(0.04)	0.20***	(0.02)	0.42***	(0.05)	0.36***	(0.05)	0.35***	(0.03)	0.36***	(0.05)	0.30***	(0.05)	0.06*	(0.03)
67-69	0.47***	(0.03)	0.41***	(0.04)	0.28***	(0.02)	0.49***	(0.05)	0.43***	(0.05)	0.41***	(0.03)	0.45***	(0.05)	0.39***	(0.05)	0.15***	(0.03)
70-72	0.65***	(0.03)	0.55***	(0.03)	0.38***	(0.02)	0.64***	(0.05)	0.54***	(0.05)	0.54***	(0.03)	0.66***	(0.05)	0.55***	(0.05)	0.24***	(0.03)
73-75	0.79***	(0.03)	0.65***	(0.03)	0.51***	(0.02)	0.81***	(0.05)	0.67***	(0.05)	0.68***	(0.03)	0.78***	(0.05)	0.65***	(0.05)	0.37***	(0.02)
76-78	0.95***	(0.03)	0.84***	(0.03)	0.65***	(0.02)	0.99***	(0.05)	0.86***	(0.05)	0.86***	(0.03)	0.92***	(0.05)	0.84***	(0.05)	0.48***	(0.02)
79-81	1.06***	(0.04)	0.98***	(0.04)	0.80***	(0.02)	1.09***	(0.05)	1.03***	(0.05)	1.02***	(0.03)	1.04***	(0.05)	0.96***	(0.05)	0.62***	(0.03)
Gender (ref=men)	-0.11***	(0.02)	-0.06***	(0.02)	-0.07***	(0.01)												
Centrality of Residency																		
Least Central Regions	-0.52***	(0.03)	-0.66***	(0.03)	-0.44***	(0.01)	-0.66***	(0.04)	-0.72***	(0.04)	-0.34***	(0.02)	-0.41***	(0.03)	-0.59***	(0.04)	-0.51***	(0.02)
Less central Regions	-0.44***	(0.03)	-0.51***	(0.03)	-0.40***	(0.02)	-0.50***	(0.04)	-0.60***	(0.04)	-0.31***	(0.02)	-0.38***	(0.04)	-0.42***	(0.04)	-0.47***	(0.02)
Somewhat Central Regions	-0.43***	(0.02)	-0.42***	(0.02)	-0.34***	(0.01)	-0.47***	(0.03)	-0.47***	(0.03)	-0.29***	(0.02)	-0.39***	(0.03)	-0.37***	(0.03)	-0.38***	(0.02)
Central Regions	-0.22***	(0.02)	-0.19***	(0.02)	-0.17***	(0.01)	-0.20***	(0.02)	-0.13***	(0.02)	-0.11***	(0.02)	-0.22***	(0.02)	-0.23***	(0.02)	-0.21***	(0.01)
Most Central Regions	*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*		*ref.*	
Parents' Income Decile (ref=	0.34***	(0.00)	0.32***	(0.00)	0.24***	(0.00)	0.35***	(0.00)	0.32***	(0.00)	0.24***	(0.00)	0.33***	(0.00)	0.33***	(0.00)	0.24***	(0.00)
Constant	-6.93***	(0.08)	-4.48***	(0.05)	-2.93***	(0.03)	-6.74***	(0.24)	-4.32***	(0.10)	-3.02***	(0.07)	-7.02***	(0.09)	-4.60***	(0.06)	-2.85***	(0.03)
aic	764978.71						338167.57						426223.36					
bic	766358.92						339407.74						427504.05					
N	422538						176776						245762					

Notes: Log odds coefficients from full models that include control variables for parents' income, gender, centrality of residency, birth years. Pooled and separate models according to gender. Reference category of outcome = Low Origin. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A2: *Predictive means of same and close education between parents and children*

	(1) Mother-daughter	(2) Father-daughter	(3) Mother-son	(4) Father-son
Humanities				
Humanities, BA	0.047*** (0.002)	0.044*** (0.002)	0.048*** (0.003)	0.056*** (0.004)
Perf. arts	0.048*** (0.003)	0.054*** (0.003)	0.051*** (0.004)	0.079*** (0.005)
Humanities, MA	0.071*** (0.003)	0.078*** (0.004)	0.071*** (0.004)	0.091*** (0.005)
Theology	0.036*** (0.006)	0.117*** (0.010)	0.052*** (0.006)	0.150*** (0.010)
Education				
Preschool teach.	0.048*** (0.001)	0.039*** (0.001)	0.059*** (0.006)	0.051*** (0.005)
Voc. teacher	0.061*** (0.004)	0.047*** (0.003)	0.069*** (0.005)	0.058*** (0.004)
Teacher	0.101*** (0.002)	0.081*** (0.002)	0.117*** (0.003)	0.110*** (0.003)
Education, MA	0.095*** (0.005)	0.070*** (0.005)	0.104*** (0.011)	0.093*** (0.011)
Social Science				
Social work	0.013*** (0.001)	0.015*** (0.001)	0.016*** (0.002)	0.023*** (0.002)
Soc. sciences, BA	0.024*** (0.002)	0.022*** (0.002)	0.027*** (0.003)	0.030*** (0.003)
Soc. sciences, MA	0.038*** (0.002)	0.035*** (0.002)	0.040*** (0.003)	0.044*** (0.003)
Economics, MA	0.056*** (0.008)	0.053*** (0.008)	0.035*** (0.005)	0.058*** (0.007)
Psychology, MA	0.050*** (0.004)	0.049*** (0.004)	0.061*** (0.006)	0.051*** (0.006)
Natural Science				
Nat. sciences, BA	0.014*** (0.003)	0.163*** (0.012)	0.008*** (0.002)	0.163*** (0.008)
Engineer., BA	0.007*** (0.001)	0.150*** (0.004)	0.006*** (0.000)	0.135*** (0.002)
Nat. sciences, MA	0.024*** (0.002)	0.208*** (0.005)	0.017*** (0.001)	0.194*** (0.004)
Grad. engineering	0.024*** (0.002)	0.280*** (0.006)	0.015*** (0.001)	0.248*** (0.003)
MBA				
Business adm, BA	0.009*** (0.001)	0.041*** (0.001)	0.009*** (0.001)	0.053*** (0.001)
MBA	0.016*** (0.001)	0.077*** (0.003)	0.015*** (0.001)	0.085*** (0.002)
Law	0.023*** (0.002)	0.106*** (0.004)	0.023*** (0.002)	0.127*** (0.004)
Health				
Health, BA	0.074*** (0.002)	0.033*** (0.002)	0.080*** (0.005)	0.048*** (0.004)
Nursing	0.092*** (0.001)	0.022*** (0.001)	0.108*** (0.004)	0.035*** (0.003)
Other Health., MA	0.099*** (0.005)	0.058*** (0.004)	0.115*** (0.010)	0.122*** (0.010)
Dentistry	0.105*** (0.008)	0.169*** (0.011)	0.125*** (0.011)	0.260*** (0.015)
Medicine	0.142*** (0.004)	0.130*** (0.004)	0.170*** (0.005)	0.180*** (0.005)
Other				
Safety educ.	0.002* (0.001)	0.017*** (0.003)	0.001** (0.000)	0.017*** (0.002)
Other BA-level	0.006*** (0.001)	0.016*** (0.002)	0.005*** (0.001)	0.018*** (0.002)
N	244384	241734	175698	174075

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Notes: Different education and low origin are computed but not shown here. Separate models according to father/mother and son/daughter. The predictive means are based on full models that include all control variables (parents' income, centrality of residency, birth year). Note that same and close educational fields are combined as one category due to low cell counts of certain parent-child educational category combinations (see, e.g., the number of fathers who are preschool teachers, Table A3). Standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A3: *Frequencies of educational categories*

	Children (analytical selection)			Father			Mother		
	N	%	Cum. %	N	%	Cum. %	N	%	Cum. %
Humanities, BA	9777	2.3	2.3	3859	0.9	0.9	8146	1.9	1.9
Performing arts, arts teacher	8659	2.0	4.4	2170	0.5	1.4	2248	0.5	2.5
Preschool teacher	27048	6.4	10.8	68	0.0	1.4	2967	0.7	3.2
Teacher	43162	10.2	21.0	19368	4.6	6.0	30139	7.1	10.3
Vocational teacher	7522	1.8	22.8	2951	0.7	6.7	3406	0.8	11.1
Social science, BA	6934	1.6	24.4	4166	1.0	7.7	5128	1.2	12.3
Business adm	43379	10.3	34.7	10546	2.5	10.2	3792	0.9	13.2
MBA	22377	5.3	40.0	3847	0.9	11.1	190	0.0	13.3
Natural sciences, BA	3394	0.8	40.8	1858	0.4	11.6	776	0.2	13.4
Engineering, technical, BA	42151	10.0	50.7	29022	6.9	18.4	1453	0.3	13.8
Nursing	52079	12.3	63.1	919	0.2	18.6	27950	6.6	20.4
Social work	21951	5.2	68.3	1216	0.3	18.9	2828	0.7	21.1
Health subjects, BA	14682	3.5	71.7	868	0.2	19.1	4867	1.2	22.2
Safety educations	6541	1.5	73.3	2948	0.7	19.8	13	0.0	22.2
Other BA-level	7817	1.9	75.1	2048	0.5	20.3	1412	0.3	22.6
Humanities, MA	8404	2.0	77.1	4283	1.0	21.3	2038	0.5	23.0
Theology	2383	0.6	77.7	3070	0.7	22.1	550	0.1	23.2
Education, MA	3692	0.9	78.6	1657	0.4	22.5	763	0.2	23.4
Social science, MA	10812	2.6	81.1	1220	0.3	22.7	429	0.1	23.5
Economics, MA	1611	0.4	81.5	1203	0.3	23.0	87	0.0	23.5
Psychology, MA	3962	0.9	82.4	834	0.2	23.2	527	0.1	23.6
Law	12103	2.9	85.3	4478	1.1	24.3	736	0.2	23.8
Natural sciences, MA	19749	4.7	90.0	9891	2.3	26.6	956	0.2	24.0
Graduate engineering	25049	5.9	95.9	16447	3.9	30.5	688	0.2	24.2
Other Health educations, MA	4303	1.0	96.9	1458	0.3	30.9	726	0.2	24.3
Dentistry	1962	0.5	97.4	2987	0.7	31.6	932	0.2	24.6
Medicine	11035	2.6	100.0	8405	2.0	33.6	1473	0.3	24.9
Not completed Up. Secondary				191824	45.4	79.0	270823	64.1	89.0
Upper sec. Academic track				18031	4.3	83.2	25047	5.9	94.9
Upper sec. Vocational track				51313	12.1	95.4	9664	2.3	97.2
postsecondary				12854	3.0	98.4	9328	2.2	99.4
Missing				6729	1.6	100.0	2456	0.6	100.0
Total	422538	100		422538	100		422538	100	

Notes: The table includes the analytical selection of individuals born between 1955 and 1980 and who have completed tertiary education. Own educational categories are used in analyses. Fathers' and mothers' educational categories are used to categorize similarity of education to the children (see descriptives in Table I).

Table A4: *Summary statistics: differences between MEM and AME coefficients according to outcomes (MEM-AME)*

	Mean	Median	SD	Min	Max
Same	0.003	0.001	0.005	-0.001	0.016
Close	-0.010	-0.012	0.005	-0.016	0.000
Different	-0.017	-0.017	0.012	-0.039	0.007
Low Origin	0.024	0.024	0.015	0.000	0.053
Total	0.000	0.000	0.019	-0.039	0.053

Table A5: *Multinomial regression models of closeness in educational choices of parents and children*

		Same		Close		Different HE	
	Model	Estimate	Std err	Estimate	Std err	Estimate	Std err
Humanities, BA	Reduced	2.344	(0.085)	-0.025	(0.055)	1.202	(0.028)
	Full	2.095	(0.085)	-0.263	(0.055)	1.024	(0.028)
	Diff	0.249	(0.072)	0.238	(0.069)	0.178	(0.051)
Perf. arts	Reduced	2.150	(0.091)	0.448	(0.051)	1.329	(0.03)
	Full	1.925	(0.091)	0.233	(0.051)	1.168	(0.03)
	Diff	0.225	(0.072)	0.215	(0.069)	0.161	(0.051)
Humanities, MA	Reduced	2.886	(0.086)	1.025	(0.048)	1.699	(0.031)
	Full	2.493	(0.086)	0.649	(0.048)	1.419	(0.031)
	Diff	0.394	(0.072)	0.376	(0.069)	0.281	(0.052)
Theology	Reduced	3.308	(0.103)	0.566	(0.093)	1.527	(0.051)
	Full	3.124	(0.103)	0.390	(0.093)	1.395	(0.051)
	Diff	0.185	(0.072)	0.176	(0.069)	0.132	(0.051)
Preschool teach.	Reduced	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)
	Full	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)
	Diff	0.000	(0.072)	0.000	(0.069)	0.000	(0.051)
Voc. teacher	Reduced	0.894	(0.119)	0.296	(0.051)	0.360	(0.034)
	Full	0.800	(0.119)	0.207	(0.051)	0.293	(0.034)
	Diff	0.094	(0.072)	0.090	(0.069)	0.067	(0.051)
Teacher	Reduced	3.333	(0.073)	-0.740	(0.04)	0.627	(0.021)
	Full	3.177	(0.073)	-0.890	(0.04)	0.515	(0.021)
	Diff	0.157	(0.072)	0.150	(0.069)	0.112	(0.051)
Education, MA	Reduced	1.113	(0.157)	1.199	(0.056)	0.977	(0.043)
	Full	0.838	(0.157)	0.936	(0.056)	0.781	(0.043)
	Diff	0.275	(0.072)	0.262	(0.069)	0.196	(0.052)
Social work	Reduced	0.502	(0.093)	-1.481	(0.058)	0.330	(0.023)
	Full	0.494	(0.093)	-1.488	(0.058)	0.324	(0.023)
	Diff	0.007	(0.072)	0.007	(0.069)	0.005	(0.051)
Soc. sciences, BA	Reduced	1.572	(0.102)	-0.746	(0.079)	1.009	(0.032)
	Full	1.361	(0.102)	-0.947	(0.079)	0.859	(0.032)
	Diff	0.211	(0.072)	0.201	(0.069)	0.150	(0.051)
Soc. sciences, MA	Reduced	1.426	(0.104)	0.597	(0.047)	1.638	(0.027)
	Full	1.023	(0.104)	0.213	(0.047)	1.351	(0.027)
	Diff	0.402	(0.072)	0.384	(0.069)	0.287	(0.052)
Economics, MA	Reduced	2.320	(0.152)	0.695	(0.105)	1.687	(0.06)
	Full	1.848	(0.152)	0.244	(0.105)	1.350	(0.06)

	Diff	0.472	(0.072)	0.450	(0.069)	0.336	(0.052)
Psychology, MA	Reduced	2.211	(0.117)	0.865	(0.067)	1.780	(0.04)
	Full	1.726	(0.117)	0.402	(0.068)	1.434	(0.04)
	Diff	0.485	(0.072)	0.463	(0.069)	0.346	(0.052)
Nat. sciences, BA	Reduced	0.526	(0.193)	1.120	(0.058)	0.748	(0.046)
	Full	0.374	(0.193)	0.976	(0.057)	0.640	(0.046)
	Diff	0.151	(0.072)	0.145	(0.069)	0.108	(0.051)
Engineer, BA	Reduced	2.608	(0.074)	-0.161	(0.035)	0.259	(0.022)
	Full	2.474	(0.074)	-0.289	(0.035)	0.163	(0.022)
	Diff	0.134	(0.072)	0.128	(0.069)	0.096	(0.051)
Nat. sciences, MA	Reduced	2.704	(0.078)	1.470	(0.034)	1.178	(0.025)
	Full	2.322	(0.078)	1.105	(0.034)	0.906	(0.025)
	Diff	0.382	(0.072)	0.365	(0.069)	0.272	(0.052)
Grad. engineering	Reduced	3.530	(0.075)	1.601	(0.033)	1.242	(0.024)
	Full	3.085	(0.075)	1.177	(0.033)	0.924	(0.024)
	Diff	0.445	(0.072)	0.424	(0.069)	0.317	(0.052)
Business adm. BA	Reduced	1.802	(0.075)	-1.238	(0.043)	0.539	(0.02)
	Full	1.592	(0.075)	-1.438	(0.043)	0.390	(0.02)
	Diff	0.210	(0.072)	0.200	(0.069)	0.149	(0.051)
MBA	Reduced	1.894	(0.081)	0.645	(0.036)	1.332	(0.023)
	Full	1.434	(0.081)	0.207	(0.036)	1.004	(0.023)
	Diff	0.460	(0.072)	0.439	(0.069)	0.328	(0.052)
Law	Reduced	3.221	(0.079)	0.710	(0.045)	1.634	(0.027)
	Full	2.689	(0.079)	0.203	(0.045)	1.255	(0.027)
	Diff	0.532	(0.072)	0.507	(0.069)	0.379	(0.052)
Health, BA	Reduced	1.268	(0.092)	0.463	(0.039)	0.710	(0.026)
	Full	1.093	(0.092)	0.295	(0.039)	0.585	(0.026)
	Diff	0.175	(0.072)	0.167	(0.069)	0.125	(0.051)
Nursing	Reduced	2.656	(0.073)	-1.168	(0.04)	0.251	(0.02)
	Full	2.587	(0.073)	-1.234	(0.04)	0.202	(0.02)
	Diff	0.069	(0.072)	0.066	(0.069)	0.049	(0.051)
Other health, MA	Reduced	2.021	(0.118)	1.368	(0.054)	1.449	(0.039)
	Full	1.627	(0.118)	0.993	(0.054)	1.168	(0.039)
	Diff	0.394	(0.072)	0.376	(0.069)	0.281	(0.052)
Dentistry	Reduced	4.174	(0.10)	1.593	(0.081)	1.634	(0.06)
	Full	3.659	(0.10)	1.101	(0.081)	1.266	(0.06)
	Diff	0.516	(0.072)	0.492	(0.069)	0.368	(0.052)
Medicine	Reduced	4.174	(0.078)	1.924	(0.041)	2.052	(0.03)
	Full	3.584	(0.078)	1.361	(0.041)	1.632	(0.03)
	Diff	0.590	(0.072)	0.563	(0.069)	0.421	(0.052)
Safety educ.	Reduced	0.832	(0.12)	-2.665	(0.18)	0.727	(0.033)
	Full	0.636	(0.12)	-2.852	(0.18)	0.587	(0.033)
	Diff	0.196	(0.072)	0.187	(0.069)	0.140	(0.051)
Other BA-level	Reduced	1.208	(0.112)	-1.863	(0.131)	1.335	(0.03)
	Full	0.923	(0.112)	-2.135	(0.131)	1.131	(0.03)
	Diff	0.285	(0.072)	0.272	(0.069)	0.203	(0.052)
55–57	Reduced	0.000	(0.00)	0.000	(0.00)	0.000	(0.00)
	Full	0.000	(0.00)	0.000	(0.00)	0.000	(0.00)
	Diff	0.000	(0.072)	0.000	(0.069)	0.000	(0.051)
58–60	Reduced	0.158	(0.039)	0.141	(0.04)	0.050	(0.021)
	Full	0.142	(0.039)	0.126	(0.04)	0.038	(0.021)
	Diff	0.016	(0.072)	0.015	(0.069)	0.011	(0.051)
61–63	Reduced	0.363	(0.037)	0.240	(0.039)	0.144	(0.021)
	Full	0.329	(0.037)	0.207	(0.039)	0.119	(0.021)

	Diff	0.034	(0.072)	0.033	(0.069)	0.025	(0.051)
64–66	Reduced	0.417	(0.036)	0.348	(0.037)	0.220	(0.02)
	Full	0.388	(0.036)	0.321	(0.037)	0.199	(0.02)
	Diff	0.028	(0.072)	0.027	(0.069)	0.020	(0.051)
67–69	Reduced	0.501	(0.035)	0.440	(0.036)	0.299	(0.019)
	Full	0.468	(0.035)	0.408	(0.036)	0.275	(0.019)
	Diff	0.033	(0.072)	0.032	(0.069)	0.024	(0.051)
70–72	Reduced	0.699	(0.034)	0.594	(0.035)	0.415	(0.019)
	Full	0.648	(0.034)	0.545	(0.035)	0.379	(0.019)
	Diff	0.051	(0.072)	0.049	(0.069)	0.036	(0.051)
73–75	Reduced	0.850	(0.034)	0.707	(0.035)	0.554	(0.019)
	Full	0.794	(0.034)	0.653	(0.035)	0.514	(0.019)
	Diff	0.056	(0.072)	0.054	(0.069)	0.040	(0.051)
76–78	Reduced	1.005	(0.034)	0.898	(0.035)	0.692	(0.019)
	Full	0.949	(0.034)	0.844	(0.035)	0.652	(0.019)
	Diff	0.056	(0.072)	0.053	(0.069)	0.040	(0.051)
79–81	Reduced	1.127	(0.036)	1.044	(0.037)	0.843	(0.02)
	Full	1.060	(0.036)	0.981	(0.037)	0.796	(0.02)
	Diff	0.067	(0.072)	0.064	(0.069)	0.048	(0.051)
Gender (ref = men)	Reduced	-0.112	(0.015)	-0.066	(0.015)	-0.068	(0.009)
	Full	-0.110	(0.015)	-0.064	(0.015)	-0.067	(0.009)
	Diff	-0.002	(0.072)	-0.002	(0.069)	-0.002	(0.051)
Least central regions	Reduced	-1.134	(0.026)	-1.242	(0.028)	-0.879	(0.014)
	Full	-0.519	(0.026)	-0.655	(0.028)	-0.441	(0.014)
	Diff	-0.615	(0.072)	-0.587	(0.069)	-0.438	(0.052)
Less central regions	Reduced	-0.890	(0.028)	-0.940	(0.03)	-0.723	(0.016)
	Full	-0.439	(0.028)	-0.510	(0.03)	-0.402	(0.016)
	Diff	-0.451	(0.072)	-0.431	(0.069)	-0.322	(0.052)
Somewhat central regions	Reduced	-0.780	(0.021)	-0.751	(0.021)	-0.592	(0.012)
	Full	-0.434	(0.021)	-0.420	(0.021)	-0.344	(0.012)
	Diff	-0.347	(0.072)	-0.331	(0.069)	-0.247	(0.052)
Central regions	Reduced	-0.393	(0.017)	-0.356	(0.017)	-0.294	(0.01)
	Full	-0.219	(0.017)	-0.189	(0.017)	-0.170	(0.01)
	Diff	-0.174	(0.072)	-0.166	(0.069)	-0.124	(0.051)
Most central regions	Reduced	0.000	(0.00)	0.000	(0.00)	0.000	(0.00)
	Full	0.000	(0.00)	0.000	(0.00)	0.000	(0.00)
	Diff	0.000	(0.072)	0.000	(0.069)	0.000	(0.051)
Missing	Reduced	0.474	(0.062)	0.381	(0.061)	0.520	(0.039)
	Full	0.699	(0.062)	0.595	(0.061)	0.681	(0.04)
	Diff	-0.224	(0.072)	-0.214	(0.069)	-0.160	(0.051)

Notes: The Karlson, Holm and Breen's method (KHB method) to solve the rescaling issue in causal mediation analyses of non-linear models. This table compares with Table A1. Reduced = models that do not include control for parental income deciles; Full = models that include parental income deciles; Diff = differences between the Reduced and Full models. As the authors state in their Stata-packages (ssc install khb), '[the package allows the comparison of effects of nested models for many models of the GLM framework, including logit, probit, ologit, oprobit, and mlogit. The basic idea of the method is to compare the full model with a reduced model that substitutes some Z-variables by the residuals of the Z-variables from a regression of the Z-variables on the key-vars (see Karlson/Holm/Breen 2011 for explanations and details). The method consequently allows separation of the change in the coefficient that is due to confounding and the change that is due to rescaling.'