Intergenerational Educational Mobility and Life Course Economic Trajectories in a Social Democratic Welfare State

Martin Hällsten, Department of Sociology, Stockholm University*

Meir Yaish, Department of Sociology, University of Haifa

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Abstract (191 words)

We test a prediction of cumulative advantage theory about enduring life cycle effects of educational mobility on earnings. We identify four mobility groups, by cross classifying parental education (degree/no degree) by that of their offspring (degree/no degree), and study the long-term economic consequences of intergenerational educational mobility. Data for this study come from Swedish population registers, covering birth cohorts between 1953 and 1955. We analyze earnings trajectories of Swedish men and women, in each educational mobility category, over most of their working age life course. We find that the earnings trajectories cluster in two groups that reflect the educational destination. These results suggest that mobility trajectories in the Swedish labor market does not follow any strong pattern of cumulative advantage, but instead are explained by attainment of human capital. By contrast, complementary analyses of mid-life wealth, not necessarily derived in the labor market, suggest more support for cumulative advantage since those with high-educated parents have much higher levels of wealth. We argue that these contrasting results, between earnings and wealth, serve to highlight the effectiveness of the Swedish welfare regime, particularly in regulating and suppressing inequality in the labor market.

* Corresponding author: martin.hallsten@sociology.su.se. This research was supported by grant 2015-01715 from the Swedish Research Council (www.vr.se). We thank participants at the RC28 conference in Frankfurt, March 2019.

1. Introduction

Perhaps the most studied set of associations in the social mobility literature are those specified under the well-known OED triangle (Goldthorpe 2007; Breen and Müller 2020); i.e., how origin (O) is related to destination (D) via education (E). Accordingly, social background affects education attainment, which in turn determines social position. In line with this depiction, industrialization and modernization theories in Sociology (e.g., Treiman 1970), as well as the human capital theory in Economics (Becker 1964/1993), argue the view that in advanced economies education is the main determinant of labor market returns—or, social position. Put differently, these theories suggest, in advanced economies, education should mediate the primordial association between social backgrounds and destinations. Indeed, research has shown that within the OED triangle, for those individuals with a college degree, the OD association is approaching null (Hout 1984; Vallet 2004; Yaish 2004; Breen and Jonsson 2007; Breen and Luijkx 2007; Torche 2011). At the same time, however, research has also consistently shown that one of the main contributing factors for education attainment is parental education (cf. Blau and Duncan 1967; Sewell and Hauser 1972). If socio-economic success (i.e., D in the OED triangle) is largely determined by education, and education is largely determined by parental education, it only begs to ask what, if at all, is the role of intergenerational educational mobility in the OED triangle, and more generally in the socio-economic attainment process? Even though parental education is a central determinant of socio-economic success in the status attainment approach (Blau and Duncan, 1967; Sewell and Hauser, 1972), and regardless of the growing literature on social as well as economic mobility that emphasizes the importance of education in facilitating social and economic mobility (Gregg et al. 2013; Gregg et al. 2017), very little scholarship is available on intergenerational educational mobility patterns and rates (Müller 1996; Hertz et al. 2007; Pfeffer 2008; Yaish, Youngshin and Park 2019), and even less so on the economic

consequences, specifically long-term income trajectories, of intergenerational educational mobility. We aim to bridge this gap in the literature, proposing fresh evidence on this issue based on data from population registers in Sweden.

The scarce research on this issue reveals that parental education has both direct and indirect effects on earnings trajectories (Gabay-Egozi and Yaish 2019; Yaish et al. 2019). These results, however, come from two advanced economies, Israel (Gabay-Egozi and Yaish, 2019) and the US (Yaish et al., 2019), who are amongst the most unequal societies in the OECD, and whose welfare regimes share many elements of the liberal model. Against this background, Sweden is an interesting test case for studying the consequences of intergenerational educational mobility for earnings trajectories, due to its very different institutional setup compared to Israel and the US. In particular, Sweden is characterized by a strong social democratic welfare regime, and is amongst the more egalitarian countries in the OECD.

In this study, then, we focus attention on the direct and indirect effect of parental education on earnings in Sweden. Just as important, however, we take a life course perspective to study the earnings trajectories (from 1973-2012) of Swedish population cohorts born 1953-1955, capturing ages 20 to 57. This is in contrast to most school-to-work transition studies that measure economic returns (occupational status, income or earnings) to education at a single point in time (Bernardi and Ballarino 2016) or based on averages over a few years (cf. Choi 2015). The life course perspective is rather rare in the field of stratification and inequality, mainly because of its demand on data (cf. Cheng and Song 2019), but carries many advantages, as discussed by Manzonni, Härkönen and Mayer (2014, p. 1285-6). Aiming to understand patterns of intergenerational transmission of education and their labor market consequences, we ask: What are the short and long-term economic consequences of intergenerational educational mobility in Sweden?

2. The Economic Consequences of Intergenerational Educational Mobility

Standard economic theory stipulates that income is largely determined by the level of individuals' education and experience. Accordingly, education enhances skills that have a direct influence on workers' productivity (Mincer 1974). The human capital theory also postulates that over the life course we should expect parabolic-shaped income curves fanning-out by education levels (Weisberg 1995, 146). One implication of this model is that returns to education should intensify over the life course.¹ Indeed, recent scholarship has recognized increasing returns to higher education over the life course in many advanced economies such as the US, Britain, Sweden, and Israel (Gregg et al. 2017; Cheng et al. 2018; Gabay-Egozi and Yaish 2019). Within human capital theory, thus, little room exists, if any, for parental education to determine individuals' earnings. This being the case, we should not expect a direct effect of parental education on their children's earnings trajectories, as presented in the first and second rows in Table 1.

Notwithstanding the importance of these findings, classical sociological theory has long viewed individuals' attainment process as a process that involves the accumulation of advantages and disadvantages over the life course (Merton 1988; Sewell and Hauser 1992). Just as important, according to this view, advantages and disadvantages are also transferred from one generation to the next (Sorokin 1959; Blau and Duncan 1967; Featherman and Hauser 1978; Erikson and Goldthorpe 1992; Jerrim and Macmillan 2015), and even across multiple generations (Mare 2011). The discrepancy between the economic and the sociological views begs the question of whether individuals' life-course income trajectories are shaped not only by individuals' own level of education but also by that of their parents.

¹ Put differently, within levels of education the returns to experience intensifies over the life course. Yet it might also imply that over the life course experience gradually overtakes education as human capital.

[Table 1 about here]

The differentiations in returns to education, like many other dimensions of social inequality, might therefore be a path-dependent process, cumulating advantages and disadvantages across generations (Bernardi 2014). The underlying idea behind this cumulative process is that an initial advantage in access to a particular resource tends to grow over time (Merton 1988; DiPrete and Eirich 2006). If success follows success, parents with more resources at their disposal may help their offspring launch a career with higher earnings, thereby leading to a long-term advantage for their offspring over their less fortunate counterparts. We apply the cumulative advantage mechanism to study the dynamics of earnings trajectories of the educationally mobile and immobile populations. Following Gabay-Egozi and Yaish (2019), we denote four possible scenarios in which, *ceteris paribus*, intergenerational educational mobility might shape life-course earnings trajectories.

The basic *cumulative advantage mechanism* postulates that the highly-educated to highly-educated parents will have both the highest average earnings levels and the highest and steepest parabolic earnings growth curve, as presented in the third row in Table 1. By contrast, the undereducated to undereducated parents will have the lowest average earnings, and also the lowest and least steep parabolic earnings growth curve, as presented in the last row in Table 1. We call this the *cumulative disadvantage mechanism* (cf. DiPrete and Eirich 2006). Extending the notion of cumulative advantage, Bernardi (2014) introduces a compensatory advantage mechanism, akin to the ‘glass floor’ mechanism discussed earlier (cf. Reeves and Howard 2013; McKnight 2015). Accordingly, the "life course trajectories of individuals from privileged backgrounds are less dependent on prior negative outcomes" (Bernardi 2014: 75). Thus, the average earnings and the earnings growth curve of the

undereducated to highly-educated parents will be positively affected by the high parental education – *compensatory advantage mechanism*. Consequently, their parabolic earnings growth curve will be in between the two groups from above, as presented in the fifth row in Table 1. Finally, Gabay-Egozi and Yaish (2019) proposed to extend the compensatory advantage mechanism to those of disadvantaged background who then experience an advantage early in their life course. In our context, for example, this scenario fits first generation academics, and we label it the *offsetting advantage mechanism*. Thus, following the logic of path-dependence and compensatory advantage, we should expect that the low parental education level will work to offset their educated offspring's earnings growth curve, such that their parabolic earnings trajectory will also be in between those with a double advantage and those with a double disadvantage. The fourth row in Table 1 presents this expectation.

3. The Social context

Our study context is Sweden, which is often described as a social democratic welfare state. Education is since long without tuition at all levels, and tertiary education was gradually expanded to meet increasing demand. On the elementary and upper-secondary levels, the curriculum is standardized and the vocational academic divide in secondary school is relatively weak. It is a good example of a *standardized* and *non-stratified* educational system (Allmendinger 1989). Despite this, educational mobility is not extremely low in a comparative perspective. Even though Sweden has experienced equalization over time (Jonsson 1993; Breen et al. 2009), and educational inequality linked to social class origin is on the weaker side (Breen et al. 2009), many studies show intergenerational correlations in education to be rather average in a comparative perspective (Müller 1996; Hertz et al. 2007;

Pfeffer 2008). The expansion of education in Sweden has particularly benefited women: females now have higher levels of education compared to men (Breen et al. 2010).

Mirroring the welfare state, the Swedish labor market is comparatively egalitarian. For much of the 20th century, it was a coordinated market economy with high levels of unionization, widespread collective bargaining and significant wage compression under the “Swedish/ Rehn-Meidner model” (Lundberg 1985). This model existed until 1983 and meant that wages were centrally negotiated with reference to occupational skill level, not individual productivity or bargaining power. Wage negotiations tended to favor the lowest paid, and wages were compressed (Alexopoulos and Cohen 2003). Since the 1980s, these features have begun to lose some ground. Unionization rates have dropped (Palm 2017), and Sweden has followed the global trend of wage decentralization over the past 30 years (OECD 2004) so that wage bargaining is now more individual, especially for white collar workers. For blue collar jobs, wage bargaining is still to a large extent done on the industry level (Korpi and Tåhlin 2011). Nonetheless, 90 percent of the workforce is still covered by collective bargaining agreements (Hällberg and Kjellström no date) and wage inequality is still very low in Sweden (Avent-Holt et al. 2020). Low wage inequality is also reflected in comparatively low returns on schooling and low income inequality (Corak 2013). Sweden also has comparatively high intergenerational class and income mobility (Blanden 2013; Corak 2013).

While female labor force participation rates are high and almost on a par with males, gender wage (and income) inequality is still pronounced in Sweden. A multitude of factors create this inequality, prominently occupational segregation and work interruptions and adaptation due to child bearing (Grönlund, Halldén and Magnusson 2017) more than within-job wage differences (Meyersson Milgrom, Petersen and Snartland 2001). Experimental evidence do not suggest widespread hiring discrimination of females nor mothers (Bygren, Erlandsson and Gähler 2017).

The Swedish context lead us to anticipate that the intergenerational inequality transmissions would be comparatively weak. Thus, applying the four cumulative advantage mechanisms discussed in the previous section to the Swedish case, we should expect to find more modest intergenerational transmission of advantages and disadvantages in Sweden compared to e.g., Israel and the US (Gabay-Egozi and Yaish 2019; Yaish et al. 2019), where the educational and labor market contexts are less egalitarian. Put differently, we expect very small, if at all, direct effects of parental education on life course earnings in Sweden.

The above discussion on the Swedish welfare state illustrates the effectiveness of the Swedish welfare state in reducing inequality of educational opportunity and in labor market outcomes. As such, these policies may not be as effective in reducing inequalities not generated by the labor market, such as wealth inequality and the intergenerational transmission of wealth.

The level of wealth inequality in Sweden is however ambiguous. Studies often find that wealth inequality in Sweden is much higher compared to Sweden's relatively low income inequality (Jäntti, Sierminska and Smeeding 2008; Pfeffer and Waitkus 2019). However, since Sweden has an extensive and compulsory pension systems, direct comparisons of wealth with other countries that may not have similar pension systems might be biased (Domeij and Klein 2002). A conservative conclusion is that wealth inequality in Sweden is at the very least not as low in a comparative perspective as income inequality.

The level of intergenerational wealth persistence is also substantial in Sweden, and more on a par with the level of intergenerational persistence in the US than in other Nordic countries (Adermon, Lindahl and Waldenström 2018). The intergenerational persistence level in Sweden, moreover, is to a large extent the result of inheritance and inter-vivo transfers, and not the result of accumulation of saving over the life course. Given the high level of intergenerational wealth persistence and all but low wealth inequality, we expect direct

parental education effects to surface in the Swedish context on wealth. This suggests that the four scenarios derived from the cumulative advantage mechanisms presented above, and in Table 1, will apply to wealth.

4. Data and methods

4.1. Analytical Strategy

Our aim is to analyze earnings trajectories for individuals with and without intergenerational educational mobility experiences. In the main analysis, we base the mobility experiences on having or not tertiary education to parents with and without tertiary education. We thus distinguish four categories of intergenerational educational mobility: upward mobility (Up), immobile high (Hi-Hi), downward mobility (Down), and immobile low (Lo-Lo). In auxiliary analyses we also analyze based on social class (being in the service class 0/1 in both generations). We will control for selection into these categories using information on cognitive ability and non-cognitive skills assessed around age 18, that is, before entry into tertiary education.

4.2. Data

We use Swedish population registers for cohorts born 1953 to 1955. We have chosen these cohorts as they have entered tertiary education *during* the first phase of the big expansion that lasted for cohorts born up until the late 1950s, and before the second expansion in the 1990s (see figure A1). We focus on very few cohorts in order to not confound cohort and period trends. We collect information on individual's own and their parental education from the education register (1985-). This register, in turn, draws on information from graduation records from schools (since 60s for tertiary education, early 70s for upper-secondary

education, and late 80s for elementary education) and censuses (from 1970 to 1990). In practice, this means that information on parents' education is mostly collected from censuses. We use a dominance coding (Erikson 1984) capturing if at least one parent had a tertiary degree.² To code mobility, we code whether or not each generation achieved tertiary degrees (0/1), and generate the four mobility categories based on this cross-tabulation: Upward mobility, stable high (referred to as Hi-Hi), Downward mobility and stable low (Lo-Lo). Table A1 shows a cross-tabulation of these four categories by birth cohort and Table A2 by gender. The absolutely vast majority, around 80 percent, are in the stable low category. Of the rest, many are upwardly mobile (some 14 percent) and the downwardly mobile and stable high make up some 3-4 percent each.

For sensitivity analyses, we have also defined mobility by EGP class, with EGP for the “high” condition. The prevalence of EGP I is different than having a tertiary degree, and the two are related but not identical. We have a much lower fraction of stable low (around 60 percent), more upwardly mobility (20 percent), and some 8-9 percent downwardly mobility and stable high. This should make the groups less selective. Nevertheless, the results are very similar when using EGP.³

In order to analyze earnings trajectories, we collect longitudinal annual information on earnings from tax records 1973 to 2012. Earnings refer to the whole year, and are unadjusted for work hours. The earnings concept we use is before tax, but with employment related

² Even though other schemes are possible (based on mother, father, or coding the number of parents with degrees), we have prioritized parsimony over specificity (but see Thaning and Hällsten 2018 for a critical perspective).

³ The source information on EGP was obtained as follows: collect information on social class from censuses 1960 to 1990, and from the occupation register (2001-). The censuses contains information on the nomenclature NYK (1960) and NYK85 (1985-) which we code to a seven class version of the EGP social class scheme (Erikson and Goldthorpe 1992). The NYK85 matches perfectly to EGP, whereas for the older NYK, we use a modal coding routine (Erikson and Jonsson 1993; Erikson, Goldthorpe and Hällsten 2012). We use a similar modal coding routine to map the ISCO-88 codes in the occupation register to EGP, also dominance coded.

transfers included, i.e., sick leave and parental leave benefits.⁴ We convert the annual earnings into age-specific earnings, and analyze them using both log and rank transforms (Dahl and DeLeire 2008; Chetty et al. 2014).

Complementary data also include wealth for 1999-2007 from the wealth register (see Hällsten and Pfeffer 2017 for details). For these years, the Swedish wealth register existed and contains unusual rich data on wealth; both self-reported via taxation for the purposes of wealth tax, but also collected from banks and estate registers. We take the average wealth in these years and convert them to ranks, which is an optimal transform for wealth (Killewald, Pfeffer and Schachner 2017). To facilitate a comparison to our analyses of earnings, we also construct earnings averages for the same time period. For sensitivity analyses, we also use information in monthly wages, standardized to reflect full-time employment and adjusted for inflation. A limitation is that the wage data (Statistics Sweden 2013) have only partial coverage in the private sector for firms with less than 500 employees. Here, a firm level cluster sample is used. We use data from 1990 and onwards, which then gives us a focus on the later career, and use sampling weights to achieve population level representativity.

Since we expect important selection into the four educational mobility categories, we use information on cognitive ability and non-cognitive skills from military enlistment data to adjust our estimates. This data is unfortunately only available for men. Enlistment typically took place at age 18 and was mandatory for all males. Importantly, this measurement is before any entry into tertiary education, and thus very timely for our research design. The measure of cognitive ability is based on an underlying theoretical model with four dimensions: reasoning, verbal understanding, spatial ability and technical understanding, captured by subtests called

⁴ Unemployment benefits and the like are not included here

instructions, concept discrimination, paper form board and a technical comprehension. the test is very close to the G-factor of general intelligence (Carlstedt and Mårdberg 1993; Carlstedt 2000, p. 37).

Non-cognitive skills were assessed during a 20-minute interview with a skilled psychologist that aimed to evaluate psychological fitness for military service. Four factors are assessed: (a) Social maturity (sense of responsibility, independence, extroversion, and dominance); (b) Intensity (the capacity to activate oneself without external pressure, the intensity and frequency of free-time activities); (c) Psychological energy (ability to take the initiative, perseverance, capacity to activate oneself and others, and ability to fulfil and complete plans); (d) Emotional stability: ability to control and channel nervousness, tolerance of stress and disposition to anxiety (Mood, Jonsson and Bihagen 2013). Each of these dimensions are rated on a scale of 1 to 5 where average refers to normal functioning, and are then summarized. This measure of non-cognitive skills has high predictability for labor market outcomes (Lindqvist and Vestman 2011). Cognitive ability and non-cognitive skills have been transformed to z-scores. Table A3 shows descriptive statistics for both outcome (non-transformed) and our key control variables.

In sensitivity analyses, we also include controls for 1) field of study, and 2) other dimensions of parents' SES. Field of study is measured as the two-digit version of the educational orientation measure in SUN2000, the Swedish variant of ISCED-97. This measure contains around 300 categories, and are treated as fixed effects in the analyses. Parents' SES is measured via mother's and father's total disposable incomes between 1968 and 2012 (a good proxy for permanent income), an average of mother's and fathers' highest achieved ISEI score (Ganzeboom, De Graaf and Treiman 1992), based on census data 1960-1990 and the occupation register 2001-2012, and an average of mother's and father's taxed wealth in 1981-1989. These three SES measures are used in rank form. Table A4 shows

bivariate correlations between the educational mobility categories and our key control variables, including parents' SES.

4.3. Methods

For the analysis of the economic consequences of intergenerational educational mobility, we adopt a somewhat simplistic approach. In principle, our aim is to estimate growth curve models over four educational categories: upward, hi-hi, downward and lo-lo. However, instead of parameterizing this as a multilevel model with polynomials for age, we take full advantage of the rich longitudinal data and the large sample sizes of population data and analyze the age-earnings curves in a non-parametric estimation using age-specific linear regressions. For each age, we conduct a separate regression to net out influence of control variables. We then compute the predicted values for each of the educational categories to get age-specific predictions of earnings. As opposed to traditional growth curve models (Singer and Willett 2003), our interest is in the average trajectories, and not in the individual specific deviation from those. Our approach allows for an empirical and flexible estimation and produces trajectory patterns that are hard to parametrize with standard polynomials. Sensitivity analysis using growth curve models yield comparable results when it comes to comparing our mobility categories (not shown). However, when we compare the curves generated from our two approaches, the parametric growth curves are strongly over-smoothed. We prefer the non-parametric specification because it is truer to data and does not impose structural form assumptions into our model.

5. Results

[Figure 1 about here]

Figure 1 shows the estimated earnings rank trajectories for males and females, with (right) and without (left) adjustment for cognitive ability and non-cognitive skills. The underlying models else only controls for birth years, but are estimated separately for males and females. For females, the lack of enlistment data prevents us to estimate the adjusted models. In the graphs without adjustment to the left, the early 20s is an unstable phase. We observe a gradient where those *without* parental or own higher education are best off. At age 27 or 28, this pattern reverses. After age 30, the trajectories cluster in two dimensions that reflect the educational destination: the immobile high (Hi-Hi) and the upward mobility on the one hands, and the immobile low (Lo-Lo) and the downward mobility on the other. The clustering is immediate for males, and becomes apparent for females after age 40. These two clusters match both in their levels and overall growth rate. Having at least one highly educated parent is still a privilege in both the high and low educational destinations, but this is dwarfed by the large benefits of acquiring higher education for oneself.

In the right panel, we adjust for cognitive ability and non-cognitive skills, which tends to diminish the privilege of having high origin, but does not influence the large advantage associated with own education. For those male children with tertiary education, the advantage of tertiary educated parents now arises in the late 30s and remains until the late 40s, when the gap closes. For the males without degrees, there is an initial advantaged of educated parents that close by the late 30s and then reappear by age 50. But, overall, any advantages by educational origin are relatively small. In conclusion, the patterns are consistent with a classical human capital perspective: those who take no tertiary education have higher earnings initially, but then flat trajectories with little growth. Individuals who take up tertiary education

earn little initially, and then experience very strong growth during labor market entry and in the early years on the labor market, after which growth slows down.

[Figure 2 about here]

Figure 2 displays an alternative specification, with log earnings as the outcome. The main patterns come out very similarly as in the rank specification. However, the clustering by destination is more apparent with logs. Even with adjustments, the privilege associated with high parental education for the educated male children is now present from age 30 until the very last years when it seems to close again. But in magnitude, the advantage is small. In the cluster without tertiary education, the downwardly mobile has a very slight disadvantage that appears sporadically across age. When comparing the results across specifications, ranks explode small differences in comparison to logs, but also more strongly down-weight very large differences. The small discrepancy across these transforms suggest that the privilege is driven by the tails of the distribution within each mobility group. The Hi-Hi group likely has some individuals with very high earnings that spillover on the log estimates, but not on the rank estimates. However, the main message is that our results are not very dependent on functional form. The log specification also highlights the increase in absolute levels of earnings during the life-course, which becomes more of a zero-sum game when viewed in rank dimension.⁵ Figures S1 and S2 in the web appendix conducts the same analysis but uses EGP I (service class) to define the advantageous group, and the same conclusion holds also with this specification.

⁵ Earnings are in fixed prices

[Tables 2 and 3 about here]

Tables 2 and 3 takes a closer look at three selected ages (35, 45 and 55) and display five different specifications for males: the empty model, and then (cumulative) adjustment for cognitive ability, non-cognitive skills, and our sensitivity analyses involving field of study and further dimensions of parents' SES. Field of study is of course a part of the destination, and so this covariate can only explain further origin advantages within the destination states, and therefore it only makes sense to compare Hi-Hi with Upward mobility, and to compare Down and Lo-Lo. To ease interpretation, we have split the sample by educational destination

Table 2 shows the results of a rank specification, and Table 2 the log specification. We focus first on those with a high educational destination. Here, it is clear that adjusting for cognitive ability influences on the estimates more than non-cognitive skills (the results are not dependent on order of inclusion). With the controls for cognitive ability and non-cognitive skills, we find up to an advantage of 2 percentiles (Table 2, model 8/age 45) advantage for being immobile high vs. upwardly mobile with the rank specification (Hi-Hi vs. reference). In the log specification, the maximum advantage for the same group is 6 percent (Table 3, model 6/age 45). These estimates substantiate the patterns we have seen in Figures 2 and 3. When we control for field of study, this advantaged is wiped out. Controlling for other dimensions of parents' SES does not change this conclusion much, although we can see a significant substantively small reversal of the difference so that those who are upwardly mobility get a slight earnings rank advantage at ages 35 and 55 net of field of study and parents' SES. This finding is not robust as it does not show up with the log specification.

In the destination group without tertiary education, we find some differences across age groups in the results. At age 35, the empty models contain no substantive differences between

Down and Lo-Lo. Controlling for cognitive ability introduces an earnings disadvantage for the downwardly mobility, and adding the further controls strengthen the disadvantage, especially the control for parent's SES. At 45 and 55, there is an initial earnings advantage for the downwardly mobile that is zeroed or flipped with the control for ability and skills, and then again strengthened by field of study and especially parents' SES. This pattern is robust across ranks and log specifications. Figure S3 and S4 in the Web Appendix shows the full age gradients (similar to Figure 1 and 2, without splitting the sample) and confirm this conclusion.

In a sensitivity analysis, we have analyzed differences across the earnings distribution. We find in Table S1 in the web appendix that upward mobility increases the chances of avoiding low earnings at age 35, but is hindering people to get high earnings. But at older ages we find no differences. Downward mobility, on the other hand, has opposite effects: it increases risk of both high and low earnings. This suggest the associations are heterogeneous. We have also analyzed effects on wage variance in Table S2, and find that downward mobility is associated with higher variance, but no association for upward mobility.

As a further sensitivity check, we have also analyzed log monthly wages with the large cluster sample described above. While we lack these data for the initial career, where there is much more general instability, they cover older ages where we also have found the small advantages related to origin. Figure A2 provides at first sight a partly different narrative, where the advantage of tertiary educated parents is much larger throughout all specifications. This indicates that origin advantages are concentrated to the price of labor, and partly offset by differences in employment and worked hours. However, we have also made further specification tests similar to above as depicted in Table A5. These results suggest that controlling for field of study closes the gap between stable high and upwardly mobility, and between downwardly mobility and stable low. Further controlling for parents' SES makes no

substantive difference, except for a sign switch for the upwardly mobile at age 55, who appear to hold some conditional advantage with these controls in. Our main conclusion is then that the results hold up very well when we examine a more fine-grained (but less representative) outcome measure.

Figure 3 and 4 shifts the perspective to wealth, which we can assess by the highest accuracy only in a fixed time period (1999-2007). We make a comparison to earnings ranks in Figure 3, and show the corresponding wealth ranks in Figure 4. For earnings, the previously pattern of strong clustering by education destination is very prevalent, and that within these clusters, having highly education parents shows some smaller advantage. For wealth however, the origin and destination advantages are roughly equal in size: having a tertiary degree is beneficial, as is having tertiary educated parents. This holds also when we adjust for cognitive ability and non-cognitive skills for men. For both males and females, the immobile high experience the highest level of wealth, followed by upward mobile, downward mobile, with immobile low in the last place.

6. Discussion

We have analyzed individuals' earnings trajectories in relation to their educational mobility, and found very limited influence of parents' education. Instead, the educational destination is what determine labor market careers. These results suggest that earnings trajectories in the Swedish labor market do not follow a pattern of cumulative advantage, but are instead explained by attainment of human capital. That is, our results show that parental education do not have significant direct effects on life course earnings in Sweden.

Nonetheless, we find an initial—fairly small (2 to 6 percent)—parental education effect on earnings trajectories, that was subsequently explained away by field of study. This

depiction, then, runs contrary to the human capital theory that dismisses parental effects on earnings. At this point, one should bring back in sociological assertions about reproduction processes that highlight the importance of social background (cf. Bowles and Gintis 1976; Halsey, Heath and Ridge 1980; Bourdieu 1984; Goldthorpe 2007). Thus, for example, when education functions as a legitimate means for social inclusion and exclusion practices (for an extensive review, van de Werfhorst 2011), a person's credentials indicate whether he/she comes from the 'right' social circles. In a similar vein, also parental education can be a resource. Akin to our findings about the mediating role of field of study, moreover, one can reasonably argue that it is the highly educated parents that can better guide their children on what fields to study so as to maximize returns in the labor market.

The very small effect of parental education on earnings trajectories prior to the inclusion of field of study, however, should bring one to conclude that the Swedish case is best described as adhering to the human capital model. In the context of the OED triangle discussed from the outset, this implies that net of E (education), O (origins—parental education) and D (destination—life course earnings) are statistically independent of each other. This finding is contrasted with findings from recent studies with similar research questions and design in Israel and the US (Gabay-Egozi and Yaish 2019; Yaish et al. 2019).

We attribute these contrasting findings to differences in the overall level of inequality between these social contexts. Accordingly, Israel and the US are amongst the most unequal societies within the OECD, while Sweden is among the most egalitarian societies (OECD 2019). It should be noted that prior studies have found lasting effects of social background on the level of earnings even when education is controlled for (Erikson and Jonsson 1998; Hällsten 2013); yet, the focus here is on the trajectories of earnings over the entire life course, and specific focus on education as a dimension of social origins.

It is well appreciated in the sociological (and recently also in the economic) literature that overall levels of economic inequality attenuate intergenerational reproduction forces, resulting in stronger/weaker origins effects on destinations in more/less unequal societies (Raftery 1983; Treiman and Yip 1989; Erikson and Goldthorpe 1992; Andrews and Leigh 2009; Yaish and Andersen 2012), see also (Blanden 2013; Corak 2013). Tyree, Semyonov and Hodge (1979) were perhaps the first to articulate this argument, however. Accordingly, rates of intergenerational mobility (i.e., the OD association in the OED triangle) are assumed to be affected by the socio-economic distance between social classes. If inequality is high, these authors argue, the consequences of downward mobility for those in high class positions are more severe than if the distances between the classes are small. As a result, those at the top of the class hierarchy are highly motivated to ensure that the status quo is maintained under conditions of high inequality and thus mobilize their resources to this end. On the other hand, elites have less reason to be concerned with securing their privilege when inequality is low, resulting in fewer barriers for social mobility.

In the Swedish case, we argue, state policy to maintain relatively low level of inequality in education attainment and labor market outcomes is chiefly responsible for the negligible direct parental education effects on life course earnings. At the same time, however, our findings also expose significant origin effects, net of education, on wealth. That is, parental education does have in Sweden a direct effect on wealth. This highlights how intergenerational mobility processes are multidimensional. It implies that welfare state institutions may be effective in reducing intergenerational inequality that is transmitted via education, but ineffective regarding direct transfers of assets and ownership. This result provides a reminder to students of inequality and stratification that inequality can circumvent policies aiming to eradicate it, and emerge—even in relatively equal societies—in areas less prone to state regulation and interventions.

The Swedish welfare state has been less effective in reducing inequalities in wealth, but this may not be surprising given that social democratic reforms in Sweden from the 1930s onward have typically not been aimed at challenging the capitalist class, but to improve conditions for other classes, specifically achieving a more equal income distribution, while maintaining private ownership. The preoccupation with equality instead of nationalization of ownership is indeed a characteristic divide between socialism and social democracy (Roemer 2008). Swedish industrial relations are often referred to as consensual and collaborative, as exemplified by the Saltsjöbaden agreements in 1936 where employers and unions agreed to establish forms to avoid strikes and conflict and to make negotiations with minimal involvement of the state. Sweden is a country with a very strong manufacturing industry, and avoiding conflict may have been fair price to pay to get support for high taxation and relatively equal pay.⁶

To be able to derive robust and coherent policy recommendations from these conclusions, more research on the direct effects of parental education on life course earnings and other pecuniary privileges is needed, across a variety of contexts and inequality regimes. Preliminary results from similar study in Denmark (Birkelund, Karlson and Yaish 2019) provide reassuring results that are consisted with the results and conclusions we made here on the basis of the Swedish case.

7. References

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⁶ But there has also been conflict and steps in more socialist direction, as with the implementation of employee funds, where the Swedish government taxed a proportion of company profits to buy shares in listed Swedish companies to slowly transfer ownership from private to collective (these funds are since the 1990s dismantled).

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Figure 1. Trajectories in rank earnings by mobility group for males (top) and females (bottom), unadjusted (left) and adjusted (right)

Note: Earnings refer to income from labor and labor-related transfers pre-tax. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to attainment of tertiary degrees among parents and children. 95% Confidence intervals in grey.

Males, unadjusted

Males, adjusted

Females, unadjusted

Figure 2. Trajectories in log earnings by mobility group for males (top) and females (bottom), unadjusted (left) and adjusted (right)

Note: Earnings refer to income from labor and labor-related transfers pre-tax. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to attainment of tertiary degrees among parents and children. 95% Confidence intervals in grey.

Figure 3. Earnings rank in 1999-2007

Note: Earnings refer to income from labor and labor-related transfers pre-tax. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to attainment of tertiary degrees among parents and children. 95% Confidence intervals with capped spikes.

Males, unadjusted

Males, adjusted

Females, unadjusted

Figure 4. Wealth rank in 1999-2007

Note: Wealth refers to net worth, average of holdings in eight years. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to attainment of tertiary degrees among parents and children. 95% Confidence intervals with capped spikes.

Table 1. Expected Effects of Intergenerational Educational Mobility on Income

Theoretical Mechanism	Parental Education	Respondent Education	Mobility Group	Income Trajectory
Human capital	Irrelevant	High		High start, steep upward curve
Human capital	Irrelevant	Low		Low start, moderate upward curve
Cumulative advantage	High	High	Hi-hi	High start, steep upward curve
Offsetting advantage	Low	High	Up	High start, less steep curve
Compensatory advantage	High	Low	Down	Low start, moderate upward curve
Cumulative disadvantage	Low	Low	Lo-lo	Low start, flattest curve

Table 2. Earnings rank at age 35, 45 and 55 for males.

	Age 35					Age 45					Age 55				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
<i>Tertiary</i>															
Up	-0.026*** (-6.23)	-0.007 (-1.65)	-0.002 (-0.52)	0.011* (2.39)	0.018** (3.00)	-0.046*** (-10.44)	-0.025*** (-5.53)	-0.019*** (-4.40)	-0.003 (-0.75)	0.008 (1.44)	-0.025*** (-5.54)	-0.010* (-2.11)	-0.005 (-1.16)	0.009 (1.69)	0.011* (1.98)
Cognitive ability		0.061*** (27.63)	0.051*** (22.58)	0.018*** (5.91)	0.017*** (5.72)		0.073*** (31.36)	0.062*** (26.38)	0.025*** (7.37)	0.023*** (7.37)		0.053*** (21.79)	0.045*** (18.24)	0.019*** (6.34)	0.018*** (5.94)
Non-cognitive skills			0.047*** (23.79)	0.030*** (10.22)	0.029*** (10.49)			0.049*** (23.75)	0.034*** (9.70)	0.033*** (9.96)			0.036*** (16.61)	0.026*** (8.66)	0.026*** (8.91)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					Yes					
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	22,170	20,955	20,804	20,662	20,641	21,563	20,385	20,238	20,180	20,159	21,202	20,070	19,923	19,873	19,852
Clusters	22,166	20,950	20,798	151	151	21,559	20,380	20,232	165	165	21,198	20,065	19,917	140	140
Adjusted R2	0.003	0.038	0.063	0.262	0.262	0.009	0.055	0.081	0.252	0.253	0.003	0.026	0.039	0.121	0.122
<i>Below tertiary</i>															
Down	0.013*** (3.65)	-0.020*** (-5.69)	-0.022*** (-6.44)	-0.030*** (-6.68)	-0.058*** (-10.34)	0.047*** (12.12)	0 (-0.02)	-0.003 (-0.81)	-0.020*** (-4.09)	-0.047*** (-8.10)	0.025*** (5.91)	-0.023*** (-5.38)	-0.026*** (-6.25)	-0.039*** (-8.95)	-0.052*** (-10.46)
Cognitive ability		0.052*** (74.36)	0.037*** (50.77)	0.019*** (12.68)	0.017*** (10.88)		0.076*** (98.44)	0.059*** (73.40)	0.031*** (19.32)	0.028*** (18.53)		0.074*** (86.10)	0.056*** (62.88)	0.031*** (17.55)	0.030*** (17.84)
Non-cognitive skills			0.050*** (64.25)	0.042*** (22.82)	0.040*** (22.76)			0.058*** (67.31)	0.047*** (19.68)	0.045*** (20.41)			0.061*** (63.12)	0.048*** (17.14)	0.047*** (17.79)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					Yes					Yes
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	130,208	118,566	117,603	117,306	115,592	127,108	116,033	115,103	115,060	113,401	122,721	112,420	111,549	111,494	109,888
Clusters	130,204	118,561	117,597	170	166	127,104	116,028	115,097	229	223	122,717	112,415	111,543	324	315
Adjusted R2	0.002	0.046	0.078	0.137	0.145	0.004	0.081	0.115	0.192	0.197	0.001	0.062	0.094	0.152	0.153

Note: Reference is hi-hi for upper panel and lo-lo for lower panel. ^a other than education.

Table 3. Log earnings at age 35, 45 and 55 for males.

	Age 35					Age 45					Age 55				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
<i>Tertiary</i>															
Up	-0.082*** (-7.50)	-0.043*** (-3.87)	-0.031** (-2.83)	-0.004 (-0.30)	0.027 (1.86)	-0.118*** (-9.33)	-0.071*** (-5.56)	-0.057*** (-4.48)	-0.021 (-1.37)	0.023 (1.54)	-0.095*** (-7.01)	-0.052*** (-3.71)	-0.037** (-2.69)	0.006 (0.43)	0.025 (1.81)
Cognitive ability		0.132*** (22.34)	0.106*** (17.79)	0.042*** (4.78)	0.038*** (4.44)		0.165*** (24.35)	0.135*** (19.77)	0.055*** (4.34)	0.050*** (4.36)		0.142*** (19.38)	0.118*** (15.78)	0.047*** (5.48)	0.044*** (5.59)
Non-cognitive skills			0.115*** (22.05)	0.075*** (9.30)	0.072*** (9.51)			0.136*** (22.68)	0.095*** (11.47)	0.091*** (12.03)			0.116*** (17.60)	0.084*** (12.07)	0.082*** (11.98)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					Yes					
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	21,708	20,526	20,380	20,282	20,261	20,810	19,703	19,562	19,508	19,488	20,082	19,028	18,893	18,845	18,827
Clusters	21,704	20,521	20,374	149	149	20,806	19,698	19,556	161	161	20,078	19,023	18,887	138	138
Adjusted R2	0.003	0.027	0.05	0.196	0.198	0.009	0.038	0.063	0.217	0.219	0.003	0.022	0.038	0.119	0.12
<i>Below tertiary</i>															
Down	-0.001 (-0.12)	-0.050*** (-5.64)	-0.055*** (-6.25)	-0.066*** (-6.32)	-0.119*** (-10.88)	0.055*** (4.75)	-0.014 (-1.20)	-0.021 (-1.77)	-0.051*** (-3.54)	-0.111*** (-7.07)	0.043*** (3.50)	-0.032* (-2.53)	-0.038** (-3.04)	-0.064*** (-5.18)	-0.098*** (-6.69)
Cognitive ability		0.087*** (48.15)	0.060*** (31.65)	0.029*** (6.89)	0.024*** (5.90)		0.129*** (53.93)	0.102*** (40.87)	0.049*** (12.97)	0.044*** (11.11)		0.116*** (44.77)	0.090*** (33.18)	0.040*** (10.85)	0.038*** (9.80)
Non-cognitive skills			0.093*** (45.78)	0.079*** (16.54)	0.076*** (17.04)			0.098*** (35.86)	0.077*** (11.51)	0.074*** (11.52)			0.096*** (32.64)	0.074*** (14.23)	0.073*** (14.61)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					Yes					Yes
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	125,292	115,442	114,551	114,312	112,680	114,763	106,460	105,700	105,660	104,181	107,098	99,702	99,008	98,947	97,568
Clusters	125,288	115,437	114,545	168	164	114,759	106,455	105,694	225	218	107,094	99,697	99,002	310	301
Adjusted R2	0	0.02	0.038	0.069	0.074	0.002	0.028	0.04	0.08	0.083	0	0.02	0.03	0.063	0.063

Note: Reference is hi-hi for upper panel and lo-lo for lower panel. ^a other than education.

Table A1. Mobility groups by birth year.

Birth year	% Up Hi-Hi Down Lo-Lo				N
	Up	Hi-Hi	Down	Lo-Lo	
1953	14.3	3.7	3.1	79.0	96,155
1954	13.9	3.9	3.5	78.8	93,946
1955	13.8	4.1	3.9	78.3	96,973
Total	14.0	3.9	3.5	78.7	287,074

Table A2. Mobility groups by gender.

	Females		Males		N
	N	%	N	%	
Up	16,972	11.5	23,104	14	40,076
Hi-Hi	5,472	3.7	5,630	3.9	11,102
Down	5,351	3.6	4,643	3.5	9,994
Lo-Lo	119,243	81.1	106,659	78.7	225,902
Total	147,038	100	140,036	100	287,074

Table A3. Descriptives for key variables.

	Mean (SD)	Count
Female	0.488 (0.500)	287,074
Cognitive ability ^a	0.011 (1.018)	135,207
Non-cognitive skills ^a	-0.032 (0.926)	138,237
Earnings age 35 ^b	186.350 (103.012)	285,138
Earnings age 45 ^b	227.752 (172.756)	279,647
Earnings age 45 ^b	271.818 (224.956)	272,389
Wealth in 1999-2007	652.567 (2711.329)	281,966

Note: measurement is done up until 2012, and so not all in sample has accomplished age 50. ^a measure only available for men.

^b in 2003 prices. Control variables also include field of study, parents' income, ISEI and wealth.

Table A4. Correlations among key covariates.

		Mobility				(a)	(b)	(c)	(d)	(e)
		Up	Hi-Hi	Down	Lo-lo					
(a)	Cognitive ability, z	0.28	0.21	0.09	-0.37	1				
(b)	Non-cognitive skills, z	0.13	0.11	0.03	-0.17	0.34	1			
(c)	Parents' perm income, rank	0.09	0.29	0.22	-0.31	0.26	0.17	1		
(d)	Parents' ISEI, rank	0.11	0.30	0.25	-0.34	0.31	0.17	0.58	1	
(e)	Parents' Wealth, rank	0.12	0.15	0.09	-0.22	0.24	0.17	0.24	0.21	1

Table A5. Log wage at age 45 and 55 for males.

	Age 45					Age 55				
	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
<i>Tertiary</i>										
Up	-0.083*** (-3.88)	-0.044* (-2.17)	-0.035 (-1.72)	-0.011 (-0.66)	0.036 (1.12)	-0.110*** (-4.01)	-0.062* (-2.23)	-0.052 (-1.88)	0.006 (0.29)	0.063* (2.28)
Cognitive ability		0.117*** (4.91)	0.096*** (3.91)	0.027* (2.25)	0.024 (1.84)		0.126*** (11.03)	0.104*** (9.06)	0.043*** (5.15)	0.036*** (4.96)
Non-cognitive skills			0.109*** (6.57)	0.080*** (3.66)	0.076*** (3.80)			0.105*** (8.75)	0.078*** (4.77)	0.073*** (5.27)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	12,958	12,277	12,179	12,068	12,056	12,852	12,161	12,067	11,982	11,967
Clusters	12,954	12,272	12,173	125	125	12,848	12,156	12,061	120	120
Adjusted R2	0.021	0.067	0.117	0.409	0.415	0.014	0.066	0.111	0.375	0.384
<i>Below tertiary</i>										
Down	0.115*** (5.12)	0.065** (3.00)	0.067** (3.28)	0.033 (1.86)	-0.017 (-1.02)	0.108*** (5.61)	0.046 (1.89)	0.043 (1.88)	0.024 (1.10)	-0.018 (-0.86)
Cognitive ability		0.095*** (26.85)	0.082*** (22.36)	0.043*** (9.69)	0.040*** (10.52)		0.107*** (31.10)	0.090*** (25.40)	0.044*** (11.90)	0.041*** (10.57)
Non-cognitive skills			0.056*** (14.57)	0.042*** (6.61)	0.040*** (6.98)			0.068*** (13.15)	0.051*** (9.56)	0.049*** (9.71)
Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' SES ^a					Yes					Yes
Specification	No ctrl	+ Cog	+ NC	+ FoS	+ PSES	No ctrl	+ Cog	+ NC	+ FoS	+ PSES
Observations	50,894	47,118	46,796	46,684	46,064	50,419	46,845	46,529	46,419	45,771
Clusters	50,890	47,113	46,790	187	178	50,415	46,840	46,523	256	248
Adjusted R2	0.013	0.118	0.144	0.27	0.282	0.008	0.123	0.156	0.292	0.298

Note: Reference is hi-hi for upper panel and lo-lo for lower panel. ^a other than education.

Figure A1. Number and proportion of graduates by graduation year (left) and birth cohort (right).

Note: vertical lines refer to focal cohorts (1953-1955).

Males, unadjusted

Males, adjusted

Females, unadjusted

Figure A2. Trajectories in log wages by mobility group for males (top) and females (bottom), unadjusted (left) and adjusted (right)

Note: Wages refer monthly earnings adjust for contracted hours to reflect full time work. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to attainment of tertiary degrees among parents and children. 95% Confidence intervals in grey.

Web Appendix to “Intergenerational Educational Mobility and Life Course Earnings in Sweden”

Figure S1. Trajectories in rank earnings by **EGP Service class** mobility group for males (top) and females (bottom), unadjusted (left) and adjusted (right). Note: Earnings refer to income from labor and labor-related transfers pre-tax. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to EGP service class positions among parents and children. 95% Confidence intervals in grey.

Males, unadjusted

Males, adjusted

Females, unadjusted

Figure S2. Trajectories in log earnings by **EGP Service class** mobility group for males (top) and females (bottom), unadjusted (left) and adjusted (right)
 Note: Earnings refer to income from labor and labor-related transfers pre-tax. Adjustment (for males) is done by age-separate regression that control for cognitive ability and non-cognitive skills from military enlistment at age 18 (see text for details). Mobility groups (Up, Hi-Hi, Down, Lo-Lo) refer to EGP service class positions among parents and children. 95% Confidence intervals in grey.

Males, Field of Study controls

Males, Field of Study controls + Parental SES in other dimensions

Figure S3. Trajectories in rank earnings by mobility group for males, further model specifications.

Note: see Figure 1.

Males, Field of Study controls

Males, Field of Study controls + Parental SES in other dimensions

Figure S4. Trajectories in log earnings by mobility group for males, further model specifications.

Note: see Figure 1.

Table S1. Distribution regression of earnings at age 35, 45 and 55 for males

Educational destination			P(Y>...)					P(Y>...)				
			P10	P25	P50	P75	P90	P10	P25	P50	P75	P90
Tertiary	Age 35	Upward	0.006*	0.017***	0.014*	-0.023**	-0.039***	0.008*	0.022***	0.024**	0.006	-0.014
			(2.20)	(3.57)	(2.27)	(-3.04)	(-5.20)	(2.34)	(3.57)	(3.01)	(0.82)	(-1.70)
	Age 45	Upward	-0.001	-0.005	-0.017**	-0.036***	-0.052***	0.001	0.001	0.001	-0.002	-0.020*
			(-0.45)	(-1.10)	(-2.60)	(-4.65)	(-6.82)	(0.30)	(0.31)	(0.14)	(-0.28)	(-2.05)
	Age 55	Upward	0.006	0.008	0.008	-0.021**	-0.043***	0.009*	0.014*	0.018*	0.006	-0.005
			(1.85)	(1.60)	(1.38)	(-2.86)	(-5.41)	(2.42)	(2.24)	(2.46)	(0.68)	(-0.65)
	Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Specification	Cog/NC	Cog/NC	Cog/NC	Cog/NC	Cog/NC	FE(FOS)	FE(FOS)	FE(FOS)	FE(FOS)	FE(FOS)	
Below tertiary	Age 35	Downward	-0.023***	-0.056***	-0.065***	0.027***	0.043***	-0.021***	-0.053***	-0.065***	0.001	0.028***
			(-8.59)	(-12.03)	(-9.92)	(4.03)	(9.92)	(-4.59)	(-8.26)	(-6.75)	(0.17)	(5.49)
	Age 45	Downward	-0.043***	-0.054***	-0.004	0.053***	0.038***	-0.045***	-0.062***	-0.031***	0.019**	0.020***
			(-10.34)	(-8.80)	(-0.60)	(8.98)	(9.02)	(-5.10)	(-6.49)	(-4.20)	(2.67)	(4.71)
	Age 55	Downward	-0.034***	-0.063***	-0.047***	0.015*	0.031***	-0.038***	-0.070***	-0.065***	-0.019*	0.008
			(-7.70)	(-10.45)	(-6.71)	(2.18)	(5.80)	(-5.92)	(-7.95)	(-9.08)	(-2.41)	(1.58)
	Birth year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Specification	Cog/NC	Cog/NC	Cog/NC	Cog/NC	Cog/NC	FE(FOS)	FE(FOS)	FE(FOS)	FE(FOS)	FE(FOS)	

Note: every cell (coefficient + t-value) represents a separate regression model. The model is a linear probability model where $P(Y>Q)$ is coded 0/1, Q being the quantile of interest, following Angrist and Pischke (2009), p. 101, see also Chernozhukov, Fernández-Val and Melly (2013).

Table S2. Western/Bloome regression of log earnings at age 35, 45 and 55 for males

Table B2: Western-Born Regression of log earnings at age 35, 45 and 55 for males

		Age 35		Age 45		Age 55							
Educational destination		(1)	(2)	(3)	(4)	(5)	(6)						
		β	λ	β	λ	β	λ	β	λ	β	λ	β	λ
Tertiary	Up	-0.033**	0.09	-0.005	0.132	-0.054***	-0.021	-0.019	-0.024	-0.037*	-0.154	0.006	-0.132
		(-3.13)	(1.12)	(-0.48)	(1.48)	(-4.34)	(-0.29)	(-1.61)	(-0.30)	(-2.55)	(-1.83)	(0.43)	(-1.46)
	Cogn. ability	0.104***	-0.062	0.041***	-0.089	0.134***	-0.116**	0.053***	-0.101*	0.118***	-0.031	0.047***	-0.04
		(17.29)	(-1.50)	(6.81)	(-1.93)	(19.30)	(-2.98)	(7.88)	(-2.38)	(15.79)	(-0.69)	(6.10)	(-0.83)
	N-C skills	0.112***	-0.120**	0.073***	-0.102*	0.132***	-0.087**	0.093***	-0.077*	0.115***	-0.015	0.084***	-0.004
		(21.37)	(-3.28)	(14.96)	(-2.54)	(22.20)	(-2.70)	(16.75)	(-2.19)	(17.55)	(-0.42)	(13.15)	(-0.11)
Birth year		Yes		Yes		Yes		Yes		Yes		Yes	
Specification		Cog/NC		FE(FOS)		Cog/NC		FE(FOS)		Cog/NC		FE(FOS)	
Observations		20,380		20,321		19,562		19,562		18,893		18,893	
Adjusted R2		0.047		0.195		0.06		0.223		0.038		0.119	
Below tertiary	Down	-0.049***	0.491***	-0.062***	0.471***	-0.014	0.419***	-0.045***	0.421***	-0.036*	0.273***	-0.063***	0.267**
		(-4.61)	(5.94)	(-5.93)	(5.50)	(-1.05)	(5.49)	(-3.33)	(5.38)	(-2.52)	(3.37)	(-4.46)	(3.23)
	Cogn. ability	0.062***	0.033	0.028***	0.016	0.103***	-0.037*	0.047***	-0.054***	0.091***	0.032	0.040***	0.019
		(33.13)	(1.90)	(13.92)	(0.93)	(41.57)	(-2.29)	(17.37)	(-3.30)	(33.68)	(1.84)	(13.52)	(1.08)
	N-C skills	0.084***	-0.204***	0.070***	-0.218***	0.094***	-0.110***	0.073***	-0.119***	0.093***	-0.090***	0.071***	-0.096***
		(42.06)	(-11.76)	(34.77)	(-12.15)	(34.87)	(-6.61)	(26.98)	(-6.97)	(31.59)	(-5.01)	(23.87)	(-5.23)
Birth year		Yes		Yes		Yes		Yes		Yes		Yes	
Specification		Cog/NC		FE(FOS)		Cog/NC		FE(FOS)		Cog/NC		FE(FOS)	
Observations		114,551		114,337		105,700		105,700		99,008		99,008	
Adjusted R2		0.035		0.07		0.04		0.083		0.03		0.063	

Note: β refers to the mean of the outcome, λ to the residual variance of the outcome in a jointly estimated model following Western and Bloome (2009)

References

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