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Education Systems and Intergenerational Mobility[1]

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1. Introduction

The way in which education systems are organized has implications for economic and social outcomes and for the distribution of welfare in society. Possessing more, and higher quality, education has sizable impacts on wages and education impacts on other non-pecuniary outcomes.[2] Moreover, education has the potential to affect an individual's life course and is often championed as a means by which people from less advantaged backgrounds can advance themselves up the social ladder, thereby fostering increased intergenerational mobility.

The relationship between education and the extent of intergenerational mobility in economic status forms the subject matter of this paper. To best study the possible links between the two I consider how intergenerational mobility has altered over time in a period

[1] This work draws on, and further develops, some of my joint work with Jo Blanden, Alissa Goodman, Paul Gregg and Anna Vignoles. The views and interpretations expressed are mine alone.

[2] See Card (1999) for an extensive and comprehensive discussion of the impact of education on wages. A very recent review of the impact of education on non-economic outcomes (like health and well being) is Heshmati (2004).

when post-compulsory education expanded rapidly as the organization of the education system was restructured. Making a link between changes in the way in which the education system is organized and changes over time in mobility thus permits a test of the idea that education is a 'great leveller' that promotes intergenerational mobility.

The paper looks at these issues using rich cohort data from Britain to first study changes in intergenerational mobility through time, and then to link the findings to changing patterns of educational attainment. Particularly important to the latter issue is the way in which education-family income relationships have altered through time as this links directly to the observed changes in intergenerational mobility.

The results paint a depressing picture for those who believe education can promote increased intergenerational mobility. There is actually strong evidence that intergenerational mobility has fallen over time in Britain, so that there is now more persistence in income across generations than there was in the past. That this increase in immobility has occurred at the same time as the rapid expansion of post-compulsory education means that it is children from richer families who have benefited from this change in the education system and, rather than alleviating inequality across generations, the expansion has acted to reinforce and exacerbate already existent intergenerational inequalities.

The paper is structured as follows. In Section II I present findings on changes over time in the extent of intergenerational mobility. In Section III I consider the role played by education in accounting for the intertemporal shifts in intergenerational mobility. In Section IV I consider changing education-family income relationships in more detail. Section V concludes.

II. Changes Over Time in Intergenerational Mobility

Approach

The extent of intergenerational mobility in economic or social status at a point in time is often evaluated using a simple log-linear regression of children's outcomes on parent's outcomes for family i as follows[3]:

$$\ln Y_i^{CHILD} = \alpha + \beta \ln Y_i^{PARENTS} + \varepsilon_i$$

where Y is the measure of economic or social status of interest and ε is an error term. The coefficient β measures the extent of intergenerational mobility, reflecting how strongly children's status is associated with parental economic status. The literature usually proceeds to say that a value of zero for β (where child and parental Y are uncorrelated) corresponds to complete intergenerational mobility and a value of unity for β (child Y is fully determined by parental Y) corresponds to complete immobility.

A lot of work has produced estimates of β for different measures of Y. Whilst sociologists have studied social class mobility in detail[4], economists tend to focus more on labour market earnings or family income and I also do this. However, unlike most of the work which simply estimates β at a point in time from data on children and parents I am interested in the way it has altered through time and look at cross-cohort changes, estimated from British birth cohort data.

Much of the debate in the intergenerational mobility literature is concerned with whether a given estimate of β is small, suggesting a lot of mobility, or big, suggesting a lot of immobility. Yet there is clearly little or no agreement on what constitutes big or small. For example, .4 'consensus' estimate in Solon (1999) that emerges from regressions of son's earnings on father's earnings seems to be interpreted differently by people and value

[3] See Solon's (1999) review for a more in depth discussion.
[4] See, amongst many others, Goldthorpe and Erikson (1992).

judgments may well shape people's views. Looking at changes over time is useful in this regard since one can benchmark against an initial level and say something about whether mobility is getting better or worse.[5]

Cohort Data

The data requirements for studying intertemporal changes in intergenerational mobility are very demanding. However, there are some rich British data sources that permit such an analysis to be undertaken. In particular there are two birth cohorts, covering everyone born in Britain in a week of March 1958 and everyone born in a week of April 1970, which follow individuals from birth to adulthood and obtain a large amount of information along the way. The first of these is the National Child Development Study (NCDS), which consists of the birth population of a week in March 1958 with follow–up samples at cohort member ages 7, 11, 16, 23, 33 and 42. The second, the British Cohort Study (BCS) is very similar in style, covering a full birth population in a week of April 1970 with data subsequently collected at ages 5, 10, 16, 26 and 30. Both of these surveys have information about parental income at 16, detailed measures of educational attainment and measures of earnings at an almost comparable point in time (age 33 in 1991 the NCDS, age 30 in 2000 in the BCS).

Ideally one would like to have measures of the same permanent economic status (be it wages or income) for both generations from both cohort studies. This would permit one to estimate changes in β using the regression framework above. Unfortunately, due to different survey design, this is not possible since the NCDS parental income data comes from separate measures of father's earnings, mother's earnings and other income (all defined after taxes), and the BCS only has data on parents' combined income. One is therefore forced to base estimates on the relationship between the cohort member's earnings or income and combined

[5] There is hardly any work on changes over time in intergenerational mobility. Mayer and Lopoo (2002) consider very small samples from the US Panel Survey of Income Dynamics (PSID), finding little change in the extent of intergenerational mobility in the United States. The results I report on here come from Blanden et al (2002) and use much larger samples from British cohort data.

parental income. Whilst this will produce different estimates to the usual regression of child earnings or income on one parent's earnings or income, it remains the case that changes in the intergenerational parameter over time are measured on a consistent basis, thus allowing a discussion of changes over time in the extent of intergenerational mobility.

Estimates

Table 1 shows the results from intergenerational mobility regressions for the NCDS and BCS70 birth cohorts. The Table presents estimates from regression of cohort members' log(earnings) on log(family income) for sons and daughters separately, with three different specifications being reported.

The first specification, given in Panel A, just relates cohort members log(earnings) to log(family income).[6] It is thus the equation

$$\ln \mathrm{E}_i^{CHILD} = \alpha' + \beta' \ln Y_i^{PARENTS} + \varepsilon'_i$$

where E is labour market earnings and Y is now parents combined income.

One feature of the time period being studied is that income inequality rose in Britain. Thus it is important to adjust for changes in inequality when looking at patterns over time. This adjustment can be made by scaling the regression coefficient on log(family income) by the ratio of the standard deviation of parental income to the standard deviation of child earnings (see Grawe, 2000). Thus the adjusted estimates given in the Table are those standardizing for inequality change.

The results from the basic specification produce a very clear pattern. The estimated intergenerational parameter is significantly higher for the younger BCS cohort than for the NCDS cohort. For example, for sons the inequality-adjusted intergenerational parameter is .166 in the NCDS and rises to .260 in the BCS, with the .095 change being statistically significant. The same increasing pattern is seen for daughters, with a rise from .168 to .227,

[6] It also conditions on parental age to net out the fact that the parental earnings may be measured at different points in the life cycle.

with the change being slightly smaller at .059. Hence there seems to be a rise across cohorts, which resulted in significant falls in the extent of intergenerational mobility.[7]

One might worry that the observed changes reflect compositional changes in the characteristics of families, or differing childhood experiences of cohort members, or perhaps different ability levels across the cohorts. Panel B thus presents estimates when a set of extra factors, Z, are added to the basic specification. In the standard omitted variable bias formula one will worry that β'could be biased if an important factor in Z is omitted and, in the cross section, the bias (for the bivariate regression above) is given by $\delta.[\mathrm{Cov}(\ln Y_i^{PARENTS}, Z_i)/\mathrm{Var}(\ln Y_i^{PARENTS})]$, where δ is the coefficient on Z when it is also included in the estimating equation and $[\mathrm{Cov}(\ln Y_i^{PARENTS}, Z_i)/\mathrm{Var}(\ln Y_i^{PARENTS})]$ is the coefficient from a regression of Z_i on $\ln Y_i^{PARENTS}$, with Cov(.) denotes a covariance and Var(.) a variance. One can use this bias formula to assess the importance of particular Z factors in accounting for the rise in β over time. It is evident that stronger correlations between Z and child E or parent Y in a particular cohort will have implications for the change in the intergenerational parameter over time.

Take the case of ability. If ability is more strongly correlated with either child E or parent Y (or both) in a given time period then, when one controls for ability, this will shift β' by more in the cohort in which it is more strongly correlated. Thus the change in β'will be different from that given in Panel A where no other factors are conditioned upon.

[7] An important consideration is whether these results could be contaminated by measurement error in income as there is only a single measure of this for each cohort in the Table 1 results. Indeed point in time estimates will be biased downwards if parental income is measured with error (Solon, 1989, 1999). This has been explored in other work (Blanden et al, 2002) where two sets of robustness checks suggest that this is unlikely to affect the result of falling mobility over time. First, simulations show that, under certain assumptions about measurement error in the BCS (ranging from zero to sizable amounts), the amount of measurement error needed in the NCDS income data to offset the rise in the intergenerational mobility parameter would be implausibly large. Second, in the BCS cohort income data is available for cohort member age 10 and 16 and so one can time average the two income measures in the hope of smoothing out some of the measurement error. When this is done the BCS intergenerational mobility parameter does rise, but only moderately. Thus the rise in the intergenerational correlation does not seem attributable to differential bias due to measurement error in income across the two cohorts considered.

Panel B presents estimates where the following Z variables are added to the Panel A specifications: ethnicity, parental education, lone parent family structure, whether father was unemployed during childhood and maths and reading test score quintiles at age 10/11. It is very clear that, at a point in time, the estimate of the intergenerational elasticity falls suggesting that these factors do account for an important part of the intergenerational correlation. But it is striking that they fall by very similar amounts across cohorts and that the change over time is barely affected by their inclusion. As such it seems that the change in intergenerational mobility is not due to these pre-labour market factors associated with the cohort members' childhood and family situations.

Panel C uses a different dependent variable and relates the total family income of cohort members (i.e. now including their spouse's income if they have a spouse) and relating this to total parental income in the basic model. Again there is strong evidence of a rise in the intergenerational mobility parameter over time.

Transitions

The advantage of the regression approach is that it summarises the extent of mobility in a single number, through an average coefficient. However, this is less forthcoming in that it is unclear about the way in which the nature of the mobility process is altering. One can explore this in more detail by looking at transition matrices, which show where child-parent pairs are moving across the distribution of economic status.

Table 2 thus reports quartile transition matrices for NCDS and BCS sons and daughters. They show the proportion in each parental income quartile that move into each quartile of the sons' or daughters' earnings distribution. The extent of immobility can be summarised by an immobility index that computes the sum of the leading diagonal and its adjacent cells. These are reported at the top of the Tables. These numbers can be interpreted relative to the immobility index in the case of perfect mobility. If all individuals had an equal

chance of experiencing an adult income in each quartile all cells would contain 0.25 and the immobility index would be 2.5. As we might expect, given what we learned from the regression analysis, all the immobility indices we observe in the Table are above this number.

It is clear that transition analysis of Table 2 confirms the regression finding that mobility has fallen between the cohorts. In almost every case a higher proportion remain in the same quartile as their parents in the later cohort and there are less extreme movements between generations. For example, in the NCDS 17 percent of sons and daughters with parents in the bottom quartile rise to the top; in the BCS this falls to 14 percent for sons and 13 percent for daughters. Moving in the other direction the growth in immobility is similar with almost one fifth (17 percent for sons and 19 percent for daughters) of those who start in the top quartile falling to the bottom in the NCDS while in the BCS the corresponding percentages are 13 for sons and 16 for daughters. The overall pattern of reduced mobility is very much confirmed by the pattern of results in the transition matrices.

This section has considered how the extent of intergenerational mobility has changed across two British birth cohorts, the first born in March 1958 and the second in April 1970. One sees sharp falls in cross-generation mobility of economic status between the cohorts, reflecting that the economic status of the 1970 cohort is more strongly connected to parental economic status than the 1958 cohort. In the next two sections of the paper I consider how education is connected to these findings.

III. Educational Attainment and Changes in Intergenerational Mobility

The previous section made it clear that intergenerational mobility has fallen across the 1958 and 1970 cohorts, but also that a number of pre-labour market factors do not seem to account for the observed change. In this section I consider whether educational attainment is able to account for any of the change.

Rising Educational Attainment

It is evident, as with many other countries, that educational attainment in terms of qualifications has been rising sharply in Britain. Table 3 shows that there has been rapid upgrading of the educational status of the workforce between 1975 and 1998. The Table uses General Household Survey data to report the percentage of workers in five bands according to their highest qualification: degree or higher; having a higher vocational qualification[8]; teaching/nursing; an intermediate group (comprising those with A levels, just GCSEs, or lower vocational qualifications); and no educational qualifications.

The upper panel of Table 1 shows that the incidence of men with a degree rose from 5.8 percent in 1975 to 16.3 percent by 1998. Similarly the share of men with a higher vocational qualification went up rapidly from 4.7 to 12.1 percent. But most striking is the falling proportion of men with no qualifications, which goes down from just over half (at 50.2 percent) in 1975 to less than 20 percent (18.9) by 1998. The patterns for women, in the bottom panel of the Table, are even more marked. The proportion of women in employment with a degree rises over five-fold from a very low initial level of 2.2 percent in 1975, up to 12.5 percent by 1998. Interestingly there has been much less of a shift into higher vocational qualifications compared to men, as only 2.7 percent of working women possessed such qualifications in 1998. However, mirroring the experience of males, there has been a sharp fall in the size of the group with no qualifications, which plummets from 58.3 percent in 1975 to 23.3 percent by 1998.

Educational Attainment and Changes in Intergenerational Mobility

This makes it clear that changing education composition may be important. Table 4 reports what happens when the educational attainment of cohort members, measured by their highest educational qualifications, are controlled for in the intergenerational mobility

[8] The most important higher vocational qualifications include Higher National Certificates (HNC), Higher National Diplomas (HND) and full City and Guilds awards.

equations. There is, indeed, evidence that highest qualification matters. For the point-in-time (i.e. within cohort) comparisons they account for around 30 percent of the intergenerational transmission of income for sons and 40 to 50 percent of the transmission for daughters. Moreover, they explain some of the rise in the intergenerational elasticities. For sons the estimate of the cross-cohort rise falls by around 20 percent on inclusion of the education variables. For daughters, it accounts for 40 percent of the cross-cohort rise. Hence, the educational variables seem to explain both point-in-time intergenerational mobility and its evolution over time.

Considering the transition matrices is suggestive of even more of an education effect. Table 5 shows transition matrices that control for education. For both sons and daughters an important portion of the observed fall in mobility is accounted for by the education variables. For sons, the immobility index rises by .10 conditional on education compared with .17 in the unconditional matrices in Table 2. For daughters the conditional rise is .03 compared with an unconditional rise of .17. Thus the non-linearities allowed for in the transition matrix approach do seem to imply a bigger education effect for both sons and daughters as compared to the average regression approach considered earlier (the immobility index is reduced by 41 percent for sons and by 80 percent for daughters). As such the increased educational attainment of the younger birth cohort seems to matter in interpreting the fall in intergenerational mobility observed across cohorts.

Why Could Education Matter For Changes in Intergenerational Mobility?

It is worth considering how changing education might be a transmission mechanism underpinning the change in intergenerational mobility. Solon (2003) has formalised ideas about how education acts as a transmission mechanism underpinning the extent of intergenerational mobility. In a simple version of his model in generation t labour market earnings E are a function of human capital H so that $E_t = \phi_t H_t + u_t$, where u_t is a random error

term. If children's human capital accumulation then relates to parental income we can write $H_t = \psi_t Y_{t-1} + \nu_t$ (ν_t being an error term). One can combine these equations to generate an intergenerational mobility function like the ones reported in Table 1, $E_t = \phi_t \psi_t Y_{t-1} + \omega_t$ where $\omega_t = \phi_t \nu_t + u_t$.

Here the intergenerational mobility parameter is $\phi_t \psi_t$ so that intergenerational mobility will be higher in a given generation t if: (a) there are lower returns to human capital for children (ϕ_t is lower); or (b) if children's human capital is less sensitive to parental earnings (ψ_t is lower).

A critical factor is thus how sensitive is education to parental income (ψ_t). This related back to the discussion in the introduction to the paper about how well education does act to enable people to escape poor childhoods and to enable them to increase their earning potential and thus enhance the extent of intergenerational mobility. In the next section of the paper I consider changing education-income relations to see if they are consistent with the scope for changing educational attainment across the income spectrum as being a factor underpinning falling intergenerational mobility.

IV. The Expansion of Post-Compulsory Schooling and Changes in Intergenerational Mobility

Over the period where intergenerational mobility fell, there was a sizable expansion in the British education system. Post-compulsory participation rates, especially in higher education, rose very sharply indeed. To be a candidate explanation for the mobility falls one needs to investigate the extent to which this expansion was equally or unequally distributed across the parental income distribution and this is what is done in this section of the paper.

Expansion of the Education System

Student numbers in higher education (HE) have quadrupled in the UK since the 1960s. Figure 1 shows the Department for Education and Skills (DfES) higher education age

participation index, which measures the proportion of young people in HE, between 1960 and 2001. It contrasts the pattern of change in this index with the growth in staying on beyond the compulsory school leaving age. The Figure shows sharp increases in both from 1960 onwards. The staying on series appears to have been on a fairly steadily increasing path (although is subject to cyclical variations) from the start of the series through to the mid-1980s. From the late 1980s there appears to be a step-change as staying on rates rise much faster, from 51 percent in 1988 to a new plateau of around 70 percent in the late 1990s and early 2000s.[9] The increase in university participation is also very rapid. There was a sharp expansion in the 1960s, where the age participation index doubled from 6 to 14 percent. It then rose marginally from this level through until the late 1980s, after which it grew even more rapidly than the 1960s change. By 2001 it had reached 33 percent, rising up from under 20 percent at the start of the 1990s.[10]

HE Expansion and Family Income

To study links with shifts in intergenerational mobility, it is critical to assess how the expansion of the education system links to family background and whether one sees differential shifts in participation rates and qualification attainment across different family income groups. The principal data issue that emerges is the requirement to match up data on children's education with the income of their parents. I am again able to use the NCDS and BCS cohort studies, but these are a little out of date for an education analysis since they contain information on young people in HE (e.g. attending university) in the early 1980s and

[9] It appears likely that this rise was a consequence of the introduction of a new examination system for 15/16 year olds, the General Certificate of Secondary Education (GCSE) in 1988, and the consequent improvement in exam results (see Blanden and Machin, 2004).

[10] A discussion of the factors that lie behind the growth of higher education participation is given in Kogan and Hanney (2000). In part, the rise in participation was demand-led as students responded to the changes in the economy and the shift towards service industry jobs. Widening wage differentials between graduates and non-graduates, especially in the 1980s (Machin 1996, 1999, 2003) likely played a role here and it seems likely that HE participation may have been linked to perceived changes in economic incentives, at least amongst some groups.

early 1990s. But data from the British Household Panel Survey (BHPS), a longitudinal survey that began in 1991, can be used to form a third more up to date cohort to facilitate an examination of changing relations between education and family income for cohorts of children who could have entered HE in from the late 1970s/early 1980s through to the late 1990s.

Table 6 presents some descriptive analysis showing the proportion of young people who acquire a degree by age 23 broken down by parental income groups (the top quintile, the middle 60 percent and the bottom quintile) from the three cohorts, in 1981, 1993 and 1999 respectively. The numbers in the Table very clearly demonstrate wide gaps in degree acquisition by income group. In 1981, for example, 20 percent of children from the top income quintile had a degree by age 23, whereas the comparable number was only 6 percent in the bottom quintile. One natural metric of gauging the extent of educational inequality is the gap between the top and bottom quintiles. In 1981 this was 14 percentage points which (as the standard errors in parentheses show) was strongly significant in statistical terms.

Looking at changes through time shows a very sharp increase in higher education inequality between 1981 and 1999. In Table 6 the top-bottom quintile measure of inequality rises considerably through time, from 14 percent in 1981, through to 30 percent by 1993 and up to a huge 37 percentage points by 1999. The magnitude of these changes is large and demonstrates a considerable widening of the gap between the university attainment of the richest and poorest in the two decades the data spans. The standard errors for these changes show that the rise in educational inequality was strongly significant between 1981 and 1993, a little less precisely determined between 1993 and 1999 (largely due to relatively small sample sizes in the BHPS), and strongly significant over the full eighteen years between 1981 to 1999. The descriptive analysis therefore uncovers a very big, statistically significant, change in the association between income and degree attainment between the early 1980s and

late 1990s. Thus in the era of higher education expansion children from richer families raised their HE participation by more than those from poorer families. This is completely in line with the notion that the increased sensitivity of higher education (here degree acquisition) to parental income is a key factor underpinning falling intergenerational mobility over time.

The purpose in this paper is to document these changes, to show the magnitude of the changes and make clear how they link to shifts in intergenerational mobility. Nonetheless, it is worth remarking that education policy is likely to have played a role. Over the time of expansion, student finance became less redistributive (Goodman and Kaplan, 2003) making it relatively harder for children from poorer families to obtain funding to participate in HE.[11] This may well have acted as a deterrent effect, to further reinforce the widening educational inequality, especially if low income students are more adverse to taking on debt (see Callender, 2003, for evidence on this).

Statistical Models

As with the analysis of changes in intergenerational mobility one might also be concerned that other changes may have occurred at the same time as the strengthening of the education-income relationship. Once can therefore consider statistical models that relate degree acquisition to parental income. The starting point is a probit model relating the probability of having a degree by age 23, the 0-1 variable D, for person i in cohort c to their parent's log income, Y, and a set of control variables Z:

$$D_{ic} = \alpha_c + \beta_c f(Y_{ic}) + \gamma_c Z_{ic} + \varepsilon_{ic}$$

where f(.) denotes the functional form for parental income, which is the independent variable of interest and ε is an error term. If we continue to use quintiles as in the descriptive analysis of Table 6 the equation becomes:

[11] The political economy and redistributive implications of universal subsidies to higher education are considered in more detail in Fernandez and Rogerson (1995).

$$D_{ic} = \alpha_{1c} + \sum_{j=2}^{5} \beta_{1jc} Q_{jic} + \gamma_{1c} Z_{ic} + \varepsilon_{1ic}$$

where the Q_j variables are dummy variables for quantiles of the log income distribution, in this case quintile dummies (leaving out the lowest quintile, j = 1, as the reference group).

Due to the discrete nature of the dependent variable, the marginal impact of Q_5, the top quintile dummy, from a probit model is $\psi_c = Pr[D_{ic}=1| Q_{5ic} =1, Q_{4ic} = 0, Q_{3ic} = 0, Q_{2ic} = 0] - Pr[D_{ic}=1| Q_{5ic} =0, Q_{4ic} = 0, Q_{3ic} = 0, Q_{2ic} = 0] = \Phi(\alpha_{1c} + \beta_{15c} + \gamma_{1c} Z_{ic}) - \Phi(\alpha_{1c} + \gamma_{1c} Z_{ic})$, where $\Phi(.)$ is the standard normal cumulative distribution function. Of course, for a model with no Z controls this will simply be the measure of educational inequality defined as the gap between the top and bottom income quintile that we considered in Table 6. In terms of changes over time, say across cohorts c and c', then a measure of changing educational inequality over time is $\Delta\psi_{c'c} = \psi_{c'} - \psi_c$ (for which one can also calculate appropriately bootstrapped standard errors).

Table 7 reports estimates of educational inequality, and its changes over time, from statistical probit models where the functional form for f(.) is taken to be the set of quintile dummy variables.[12] Panel A of the Table includes no control variables and therefore reproduces the descriptive numbers from Table 1, with $\Delta\psi_{c'c}$ rising by a strongly significant .23 between 1981 and 1999. Panel B then includes a basic set of family characteristics (sex of child, family composition and parental age). These additions change the magnitude of the estimates very little and serve to slightly enhance, though very moderately, the patterns found in the unconditional models.

The specification in Panel C of the Table adds test score quintiles for reading and maths at age 11 (NCDS) and age 10 (BCS). Unfortunately this data on test scores available only for the first two cohorts, but is one of the big advantages of these data sources. This is

[12] The same, qualitative, pattern of results emerges for a range of different functional form assumptions on f(.). See Blanden and Machin (2004).

because the transmission of ability across generations is seen by many as an obvious route leading to higher attainment amongst children of better off parents. According to this line of thinking, the addition of controls for ability should substantially reduce the remaining educational inequality. This is certainly the case, with the estimate of ψ_c falling from .14 to .06 in the NCDS and from .30 to .18 in the BCS. But it is striking that the fall is of similar magnitude across cohorts. Thus the pattern of rising degree-income relations is not damaged by the inclusion of test scores, as the rise in educational inequality $\Delta\psi_{c'c}$ is estimated as a strongly significant .12, or 12 percentage points. Thus conditional upon family characteristics and test scores, the probability of getting a degree at age 23 was 12 percentage points higher for young people in 1993 as compared to 1981.

V. Conclusions

Data on children and their parents at different points in time show that in Britain the extent of intergenerational mobility has been falling over time. That is to say, where you end up in your own generation's income distribution is more recently affected more by where your parents were in their own generation's income distribution. Education seems to act as a transmission mechanism affecting mobility, but not as a means to foster increased mobility, but rather to reinforce inequalities across generations.

The fact that education systems and the way in which they are organised matters is confirmed because an important aspect of falling intergenerational mobility is the increased sensitivity of educational attainment to parental income that has occurred as the British education system has expanded. Rather than giving opportunities that enabled children from poorer backgrounds to participate in post-compulsory education it was children from parents further up the income distribution that benefited disproportionately from this expansion and this has resulted in falling intergenerational mobility in economic status.

From a policy perspective it seems key to understand how expansions of the education system end up disproportionately benefiting children from richer backgrounds. This has happened in earlier periods, in the 1950s when richer children stayed at on school, in the 1970s and 1980s when they did better in terms of leaving school with qualifications and in the 1990s in terms of getting into higher education. However, as the children from poorer families start to catch up then it seems that the children from families with more resources have already moved on and 'colonised' the next stage. It is evident that, if people want to education to act as a leveller in society, a more dynamic, forward looking approach to education policy and the organization of education systems that better understands how trends in educational inequality arise and persist is required.

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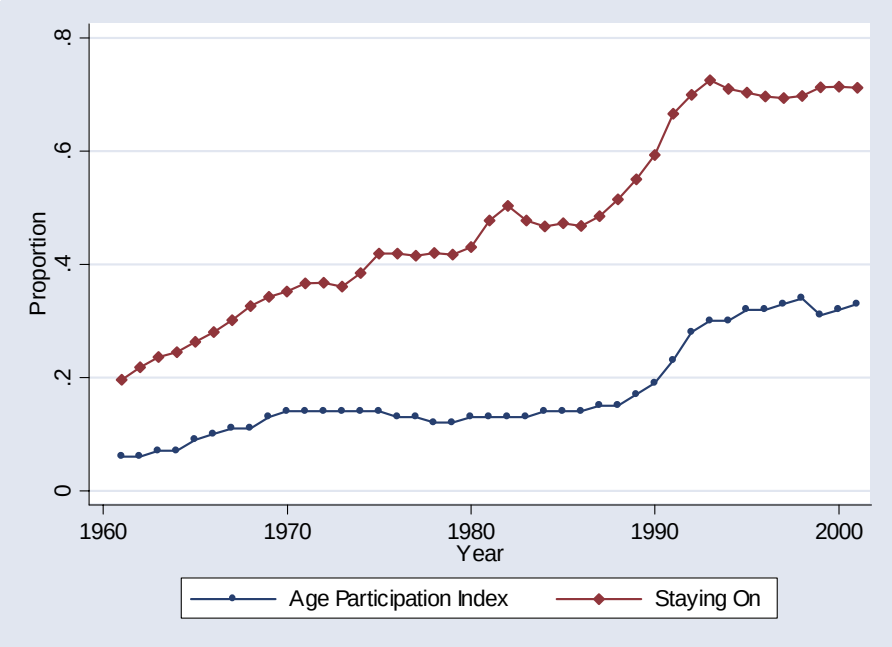
Figure 1: Changes in Education Participation



Notes: Staying on denotes staying on in education after the compulsory school leaving age. The higher education age participation index is the number of young (under 21) home initial entrants expressed as a proportion of the averaged 18 to 19 year old population. Source: DfES.

Table 1: Changes in Intergenerational Mobility in Britain

	Intergenerational Elasticities (Standard Errors)					Sample Sizes	
	Regression Coefficients		Inequality Adjusted Regression Coefficient		Cross-Cohort Change		
	1958 Birth Cohort	1970 Birth Cohort	1958 Birth Cohort	1970 Birth Cohort		1958 Birth Cohort	1970 Birth Cohort
Panel A. Basic Model							
Sons	0.175	0.250	0.166	0.260	0.095	2,246	2,053
	(0.021)	(0.021)	(0.020)	(0.024)	(0.031)		
Daughters	0.310	0.317	0.168	0.227	0.059	1,908	2,017
	(0.041)	(0.030)	(0.022)	(0.022)	(0.031)		
Panel B. Augmented Model							
Sons	0.109	0.186	0.103	0.194	0.091	2,246	2,053
	(0.023)	(0.026)	(0.022)	(0.027)	(0.035)		
Daughters	0.183	0.215	0.099	0.154	0.054	1,908	2,017
	(0.047)	(0.037)	(0.026)	(0.026)	(0.037)		
Panel C. Family Income Model							
Sons	0.159	0.300	0.123	0.261	0.139	2,110	2,015
	(0.028)	(0.026)	(0.022)	(0.022)	(0.031)		
Daughters	0.219	0.307	0.137	0.221	0.085	2,156	2,285
	(0.033)	(0.029)	(0.021)	(0.021)	(0.029)		

Notes: Estimates from Blanden et al (2002). 1958 birth cohort data are from the National Child Development Study, 1970 birth cohort data are from the British Cohort Study. Standard errors in parentheses. All regressions control for parents' age and age-squared. Augmented regressions include controls for ethnicity, parental education, family structure, whether father was unemployed during childhood and maths and reading test score quintiles at age 10/11. In the family income regressions the dependent variable is the sum of cohort member's earnings plus those of any partner.

Table 2a
Quartile Transition Matrices For Sons

Immobility Index: NCDS 2.78 BCS 2.95

NCDS	Sons' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.31	.29	.23	.17
2nd	.30	.24	.23	.23
3rd	.23	.26	.26	.26
Top	.17	.20	.29	.34

BCS	Sons' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.39	.25	.22	.14
2nd	.28	.29	.24	.19
3rd	.20	.28	.27	.25
Top	.13	.17	.28	.42

Table 2a
Quartile Transition Matrices For Daughters

Immobility Index: NCDS 2.69 BCS 2.86

NCDS	Daughters' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.27	.31	.25	.17
2nd	.30	.24	.22	.24
3rd	.25	.24	.26	.24
Top	.19	.20	.27	.34

BCS	Daughters' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.33	.31	.23	.13
2nd	.28	.28	.25	.19
3rd	.24	.22	.28	.26
Top	.16	.19	.26	.39

Table 3:
Employment Shares (Percent) by Education, 1975-98

	1975	1980	1985	1990	1995	1998
Men						
Degree or higher	5.8	8.2	12.1	12.5	15.5	16.3
Higher vocational	4.7	6.8	10.5	11.4	11.7	12.1
Teaching and nursing	1.2	1.3	1.4	1.2	1.3	2.0
Intermediate	38.3	41.2	40.7	47.9	50.7	50.7
No qualifications	50.2	42.6	35.4	27.1	20.7	18.9
Women						
Degree or higher	2.2	3.6	6.2	7.5	10.8	12.5
Higher vocational	.7	1.3	2.0	2.9	3.8	2.7
Teaching and nursing	5.8	6.8	8.4	7.9	7.4	7.7
Intermediate	33.1	39.6	46.5	52.1	54.3	53.7
No qualifications	58.3	48.8	36.8	29.6	23.6	23.3

Notes: Calculated from General Household Surveys. For 1975 through 1995, statistics are based on three pooled years with the central year reported in the Table.

Table 4:
Changes in Intergenerational Mobility and Educational Upgrading

	Intergenerational Elasticities (Standard Errors)					Sample Sizes
	Regression Coefficients		Inequality Adjusted Regression Coefficient		Cross-Cohort Change	
	1958 Cohort	1970 Cohort	1958 Cohort	1970 Cohort		
Panel A. Sons						
Table 1 upper panel	0.175 (0.021)	0.250 (0.021)	0.166 (0.020)	0.260 (0.024)	0.095 (0.031)	NCDS: 2,246 BCS: 2,053
Plus son's education	0.105 (0.020)	0.170 (0.023)	0.099 (0.019)	0.177 (0.024)	0.078 (0.031)	NCDS: 2,246 BCS: 2,053
Panel B. Daughters						
Table 1 upper panel	0.310 (0.041)	0.317 (0.030)	0.168 (.022)	0.227 (0.022)	0.059 (0.031)	NCDS: 1,908 BCS: 2,017
Plus daughter's education	0.154 (0.037)	.0167 (0.030)	0.084 (0.020)	0.119 (0.021)	0.036 (0.029)	NCDS: 1,908 BCS: 2,017

Notes: From Blanden at al (2002). Standard errors in parentheses. All regressions control for parents' age and age-squared. Educational attainment is modelled via educational qualification dummies (less than O level; O level or equivalent; greater than O level but less than degree; degree or higher).

Table 5a:
Quartile Transition Matrices For Sons Conditional on Education

Immobility Index: NCDS 2.66 BCS 2.76

NCDS	Sons' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.30	.26	.25	.19
2nd	.28	.25	.24	.23
3rd	.22	.27	.25	.26
Top	.20	.25	.24	.31

BCS	Sons' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.33	.26	.22	.19
2nd	.27	.27	.25	.21
3rd	.23	.24	.27	.26
Top	.17	.22	.26	.35

Table 5b:
Quartile Transition Matrices For Daughters Conditional on Education

Immobility Index: NCDS 2.62 BCS 2.65

NCDS	Daughters' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.27	.29	.23	.21
2nd	.27	.24	.25	.23
3rd	.25	.23	.25	.27
Top	.21	.24	.26	.29

BCS	Daughters' earnings quartile			
Parental income quartile	Bottom	2nd	3rd	Top
Bottom	.30	.26	.24	.19
2nd	.27	.24	.25	.24
3rd	.23	.25	.24	.28
Top	.20	.24	.26	.30

Table 6:
Degree Acquisition by Age 23 and Parental Income

	Degree Acquisition by Age 23			
	Lowest 20 percent	Middle 60 percent	Highest 20 percent	Educational Inequality
NCDS 1981	.06	.08	.20	.14 (.01)
BCS 1993	.07	.15	.37	.30 (.02)
BHPS 1999	.09	.23	.46	.37 (.05)
Change 1981-1993	.01	.07	.17	.15 (.02)
Change 1993-1999	.02	.08	.09	.07 (.06)
Change 1981-1999	.03	.15	.26	.23 (.06)

Notes: Sample sizes are NCDS: 5706 BCS: 4706, BHPS: 580. The year we establish degree attainment is 1999 on average for the BHPS. For the NCDS and BCS all individuals need to have graduated by 1981 and 1993 respectively. Standard errors in parentheses. Rows and columns may not add up precisely due to rounding.

Table 7:
Changes in Higher Education-Income Associations,
Specifications With Quintile Dummies

	Degree Acquisition by Age 23			Changes Over Time		
	(1)	(2)	(3)	(4)	(5)	(6)
	NCDS, 1981	BCS70, 1993	BHPS, 1999	(2) – (1)	(3) – (2)	(3) – (1)
A. No Controls						
Top Quintile	.144	.299	.371	.155	.072	.226
	(.013)	(.018)	(.054)	(.022)	(.057)	(.056)
B. Basic Controls						
Top Quintile	.143	.295	.365	.152	.070	.221
	(.013)	(.0180)	(.057)	(.022)	(.060)	(.059)
C. Basic Controls, Plus Test Scores						
Top Quintile	.061	.183		.122		
	(.012)	(.018)		(.022)		

Notes: Sample sizes as for Table 6. Marginal effects are derived from probit models of staying on beyond 16 on dummy variables for quintiles of family income as described in the text of the main body of the paper. Bootstrapped standard errors in parentheses. Basic controls are sex, parental age bands, number of siblings, no father figure at age 16. Test scores are the quintiles obtained in maths and reading scores at age 11/10. Rows and columns may not add up precisely due to rounding.