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Report

The wider benefits of higher education

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Contents

Summary	4
1. Introduction	6
2. Method	9
<i>Data</i>	
<i>Analysis strategy</i>	
<i>Variables</i>	
3. Results	19
3.1 Labour market outcomes	19
3.1.1 <i>Social class and occupation</i>	
3.1.2 <i>Unemployment and economic inactivity</i>	
3.1.3 <i>Conclusions</i>	
3.2 Skills improvement	23
3.2.1 <i>Improvements in writing, computing and mathematics</i>	
3.2.2 <i>Improvements in social skills</i>	
3.2.3 <i>Conclusions</i>	
3.3 Health and vulnerability	33
3.3.1 <i>Physical health</i>	
3.3.2 <i>Physical health in the BCS70 cohort</i>	
3.3.3 <i>Psychological health</i>	
3.3.4 <i>Physical vulnerability - accidents and assaults</i>	
3.3.5 <i>Conclusions</i>	
3.4 Parenting	39
3.4.1 <i>Educational problems of children</i>	
3.4.2 <i>Books owned by children</i>	
3.4.3 <i>Conclusions</i>	
3.5 Civic engagement	42
3.5.1 <i>Voting</i>	
3.5.2 <i>Engagement in voluntary organisations and community activity</i>	
3.5.3 <i>Conclusions</i>	
3.6 Values and attitudes	45
3.6.1 <i>Political cynicism</i>	
3.6.2 <i>Gender and race equality</i>	
3.6.3 <i>Conclusions</i>	
4. Discussion and conclusions	49
Appendices (available with this document on the HEFCE web-site www.hefce.ac.uk)	
Appendix 1 <i>Frequency distributions</i>	
Appendix 2 <i>Multivariate analysis results</i>	

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Summary

The research used data from the National Child Development Study (NCDS) to assess the effects of higher education on a number of non-economic adult outcomes, with controls in place to take into account earlier family circumstances and earlier educational attainment. Outcomes were mainly assessed at age 33. Control variables spanned the period from 33 back to birth.

Employment

- Graduates are much more likely to attain professional or managerial jobs than non-graduates. Mature graduates and non-completers (that is, people who entered higher education, but did not gain a degree) also show an advantage over A-level and below A-level qualifiers.
- Graduates are relatively protected from unemployment. However, this is less the case for mature graduates and is not the case for non-completers.

Skills improvement

- Graduates of both sexes reported more skill improvement over the past ten years than people with lower qualifications. The effects were particularly marked for mature graduates in verbal, computing and caring skills.

Health and vulnerability

- Graduates are relatively more likely to perceive themselves as in 'excellent' physical health. This is also the case, but less strongly so, for mature graduates. A younger cohort (born in 1970) also showed a strong gradient in self-assessed health by qualifications.
- Graduates are less likely to show depression than people with below A-level qualifications. Their risk of depression is similar to A-level qualifiers, when family origin and ability are considered as control variables. Non-completers are more likely to show depression than A-level qualifiers.
- Graduate men are somewhat less likely to be victims of accidents or assaults than non-graduates, while graduate women are at a lower risk of assault from their partners in dissolving relationships.

Parenting

- Graduate parents report fewer educational problems among their children. These children have more books on average than the children of non-graduate parents.

Civic engagement

- There is little difference by qualification in frequency of voting, although mature graduates have higher rates of voting.
- Graduates are relatively more likely to be members of, and actively involved in, community and voluntary associations, particularly mature male graduates. Non-completers are more likely to be involved than A-level or below A-level respondents.

Attitudes

- Graduates are more likely to have egalitarian attitudes to gender equality, and more likely to be anti-racist than non-graduates with A-levels. Women graduates and mature graduates are most likely to have egalitarian attitudes, even when controlling for type of employment.
- Graduates have more faith in the political process than non-graduates including those with A-levels. This is most marked for mature graduates.

The research provides convincing evidence of the benefits of higher education; however, more analysis is needed to estimate more precisely the extent and the form of the contribution, over other kinds of experience, that higher education makes.

1. Introduction

Research across many countries has consistently shown a return to earnings from higher education, with the benefit greater for women than for men (Apslund and Pereira, 1999). The research ranges from cross-country comparisons of earning differentials across different groups defined by qualification level, to self-reports by graduates of the value of their higher education experience to the work they do. Particularly convincing evidence of the earnings benefit in Britain comes from the work of Richard Blundell and colleagues at the Institute for Fiscal Studies (Blundell et al, 1997). Using the National Child Development Study (NCDS) dataset they demonstrated that, taking account of a wide range of family background and early educational performance indicators, the return to earnings of gaining a degree was sustained. Compared to A-levels, the proportional increase in earnings from gaining a degree held at 12% for men and at 34% for women – with a larger reduction for men than for women when the background factors were taken into account (9% reduction, men and 5% reduction, women). This points both to an increased benefit from higher education for women and an equalising effect in the sense that family background and other factors have substantially less effect on the return to earnings for women than they do for men.

Return to earnings can be described as a "private" benefit to individuals. Evidence on the wider range of benefits claimed for higher education is more limited. These include the economic benefits gained from enhanced productivity at the company level through the presence of graduates, and benefits to the health of the macro-economy more generally (Brennan, 1999). Research demonstrating the *social benefits* is even more rare, i.e. benefits to do with the social functioning of individuals and society as a whole. Benefits such as increased social cohesion may be seen as worthwhile in themselves or in terms of their (indirect) effect on the macro-economy, by for example reducing the costs of the social security and criminal justice systems. Williams (2000) reports five kinds of higher education benefits identified by economists.

1. *Monetary benefits to individual graduates.*
2. *Higher productivity of graduates.*
3. *External economic benefits: i.e. higher productivity in the economy as a whole.*

4. *Direct immediate or subsequent consumption benefits for students and graduates; higher education has been likened both to an immediate consumer good and to a durable consumer good.*
5. *External non-monetary benefits: i.e. social and cultural and similar benefits to the community as a whole from the presence of graduates.*

Building on the work of the Institute of Fiscal Studies on the earnings return to higher education, the research reported here uses the same longitudinal dataset, the NCDS, to examine a selection of benefits mainly in the fifth category – the social benefits. We address the question:

Does higher education, over and above A-levels, increase the likelihood of social benefits to those who receive it, taking account of earlier circumstances and attainment?

We examine benefits in relation to employment, skills improvement, health and vulnerability, parenting, civic engagement and attitudes.

Explanation of higher education effects

Two broad approaches have been put forward to account for economic and labour market benefits of higher education. These theories can be applied analogously to non-economic personal benefits. The first approach emphasises the cognitive competencies conferred by higher education, while the second emphasises the position of relative social and labour market advantage associated with higher education credentials. Although these dimensions are analytically separate, they are not always separated in practice (see Stacey and Behrman, 1997 for a review).

Cognitive competence: Thurow (1962) has argued that higher education does not necessarily increase the productivity of graduates, but rather serves as a screening mechanism. The higher productivity of graduates is really attributable to their greater ability. Similarly, the greater knowledge of health issues shown by graduates, and their greater compliance with health advice (Hammond, 2000), may simply reflect greater native ability to acquire information rather than higher education experience.

It is important therefore to control for cognitive ability when assessing the effects of higher education on non-economic benefits.

Labour market advantage: This concept may affect the assessment of benefits of HE from two perspectives – the characteristics of graduates before entering higher education, and their relative occupational advantage on completion. The first of these perspectives is most important for the analyses reported here. There is a body of evidence to show that children from middle-class origins are more likely than children from less advantaged origins but with equal measured ability to graduate (see e.g. Halsey et al, 1980; Egerton, 1997; Bynner, Joshi and Tsatsas, 2000). Class origins are also known to affect non-economic outcomes such as health in later life (Davey-Smith et al, 1991; Whitehead and Dahlgren, 1992). Therefore it is important not to attribute to higher education, any health or other effects which are attributable to, for instance, better foetal and childhood nutrition. Additionally, class origins continue to affect occupational attainment and earnings, even among graduates, with graduates from working class origins holding the less remunerative and less prestigious jobs (Bennett et al, 1992; Heath et al, 1993). It is important therefore to control for family background characteristics in assessing the benefits of higher education. From the occupational attainment perspective, graduates generally earn more and have superior working conditions compared with less qualified people, and this again may have non-economic benefits. Essentially this is an indirect effect of higher education. More extended models than those reported here are needed to analyse the labour market routes through which higher education might affect non-economic outcomes. The models presented here are preliminary and point to further work that could usefully be done.

The analyses reported here give a descriptive estimate of the relationship of higher education to a range of non-economic benefits, with and without controlling for family origins and childhood cognitive skill tests. For some analyses, estimates are also controlled for the effects of occupational experience. Some comparisons are made with the 1970 Birth Cohort Study (BCS70) sample in 1996 (at age 26). A

representative sub-sample of the NCDS sample, surveyed in 1995 (aged 37), was used for the parenting analyses.

2. Method

Data

Data are drawn from the National Child Development Study, a panel study of all the children born in the first week of March, 1958 (n=approximately 17,000). Five follow-up surveys have been carried out, when the children were aged seven, eleven, sixteen, twenty-three and thirty-three (Ferri, 1993). A further follow-up, using a 10% sample (n= 1,714) was carried out in 1995, in which the assessment of basic skills was the main feature (Bynner and Parsons, 1997). Complete data for use in this analysis were available for 1,568 respondents. Data from all five panels are used, giving contemporaneous information on family circumstances during childhood and adolescence, and information on early adult circumstances and achievements. Additional data from the 1995 10% sample is used for the parenting analyses. Some comparisons are made with the 1970 Birth Cohort Study, using data from primarily the age 10 (1980) and age 26 (1996) sweeps (Bynner and Steedman, 1995).

Analysis strategy

The analyses focus on a number of ‘outcome’ variables for which data had been collected in NCDS or BCS70 (see Table 2a). These were: respondent’s own class (based on occupation) at the time of interview, whether they were unemployed or in employment, skills improvement over the previous ten years, physical and mental well-being and accidents and assaults, voting, membership and participation in community and voluntary organisations, attitudes to gender equality, anti-racism and political cynicism. Logistic regression analysis was used to examine the relationships between higher education experience and all of these variables (apart from the attitude variables, where multiple regression was used – see below).

In the logistic regression results reported here, a binary *outcome variable* is used, e.g. membership vs non-membership of a voluntary organization. The method estimates the relative odds of being a member of a voluntary organization, as opposed to not being a member of one, the ‘odds ratio’, given a particular level of education. This odds ratio is compared with the odds ratio for qualifications below GCSE A-level or equivalent (the higher education entrance requirement), which is set to 1. Thus an odds ratio greater than 1 for graduates signifies a *positive* relationship between getting a degree and membership of a voluntary organisation, and an odds ratio below 1 signifies a *negative* relationship.

As will be seen later, a graduate woman is about four times as likely to be a member of a voluntary organization as a woman with below GCSE A-level, and about twice as likely as a woman with A-level qualifications. As noted earlier, it is important to control for characteristics of graduates, which may also be associated with these ‘social’ benefits. The estimates were therefore controlled for family background characteristics that are known to affect educational and occupational attainment, *viz* father’s occupation, mother’s education, parental interest in respondent’s education, over-crowding, childhood poverty as indicated by receipt of free school meals. The respondent’s ability as indicated by tests of cognitive skills at age 11 was also used as a control variable. These controls reduce the odds of graduate women’s membership of voluntary organisations by about half when compared to women with A-level or below A-level qualifications.

Additional controls included the duration of periods of unemployment, full-time housework and occupational group in the analyses of skill development. Public sector employment was used as an additional control variable in the analyses of civic engagement and attitudes. Partner's education, age of oldest child and number of siblings were used as additional control variables in the parenting analyses (Table 2b gives details of the variables).

Multiple regression was employed in the analysis of the attitude outcome variables, which were treated as continuous, i.e. having multiple values as opposed to the two

values of the binary variables considered previously. The attitude measures were aggregate scores obtained by summing across sets of opinions items, scored 1 to 5 on a scale of agreement–disagreement, and taking the mean score for each respondent. In the analysis, the regression coefficients for the education levels variable show the proportional increase or decrease in the attitude score that accompanies movement from one educational level to another, with and without controls.

Except when otherwise stated, results cited as statistically significant meet the .05 criterion, that is to say the probability of the result arising by chance is less than one in twenty ($P < .05$).

The results of both types of analysis are represented in the report by graphs demonstrating the higher education gradient for a given outcome under various conditions. Additional information is available in the appendices on the HEFCE web-site, under ‘Publications’. Appendix 1 gives the frequency distributions for men and women for all the variables involved in the analysis. Appendix 2 gives the full sets of odds ratios and regression coefficients estimates on which the graphs are based, together with their statistical significance. From these latter tables we can thus observe the relationships not only of higher education to the outcomes, but to all the other ‘control’ variables as well.

Variables

Education

Detailed qualification data are collected in NCDS. The highest qualification attained at age 33 (NCDS) or age 26 (BCS70) was collapsed into four basic categories: all *qualifications below A-level GCSE (or equivalent)* and none; *A-level (and equivalent)*; *sub-degree* (e.g. NVQ Level 4); and *degree and higher* (see Table 1a). In NCDS it was also possible to identify respondents who had enrolled on higher education courses but had not completed them, *non-completers*. It was also possible to identify *mature graduates* (i.e. students who had entered higher education aged 21 or over); these two categories were added to the classification of educational levels. However, for the analysis of the 1995 sub-sample of NCDS all the categories were merged into broader categories because of low frequencies.

Mature graduates were categorised with early graduate, and non-completers were categorised in terms of their actual educational level (Table 1b). In practice, about a third of 1991 non-completers had obtained a degree by 1995. For analyses of the BCS70 sample the simpler coding was also used. At age 26, there were few mature graduates in the sample, and non-completing higher education students could not be identified with sufficient confidence (Table 1c).

Table 1a: NCDS Condensed highest qualification - 1991

	Frequency	%
Below A-level	6,572	59
A-level & equivalent	1,483	13
Non-completers	153	1
Sub-degree	1,523	14
Mature degree	131	1
Degree & higher	1,283	12
Total	11,145	100.0
Missing values	262	

Table 1b: NCDS Condensed highest qualification - 1995

	Frequency	%
Below A-level	841	54
A-level & equivalent	240	15
Sub-degree	266	17
Degree & higher	221	14
Total	1,568	100.0
Missing values	141	

Table 1c: BCS70 Condensed highest qualification - 1996

	Frequency	%
Below A-level	5,382	64
A-level & equivalent	892	11
Sub-degree	373	5
Degree and higher	1,727	21
Total	8,374	100.0
Missing values	629	

It should be noted that the relatively small numbers in the non-completers category and in the mature graduates category means that the results need to be treated cautiously. We need relatively much larger estimates of differences between these categories and others to achieve statistical significance, than for the other comparisons. That is to say when a number of other variables are controlled, the

estimates might vary considerably within wide confidence intervals, i.e. they might not differ significantly from each other or from zero.

Table 2a: Outcome variables

Employment

Note Frequencies of the categories for each variable are given in Appendix 1.

Respondent's class. This variable was pre-coded into socio-economic groups (SEGs). SEGs 1, 2.2 to 5, and SEG 13 were coded as "service" class (professionals, lower professionals, managers and supervisors). SEGs 2.1, 6, 7, 12 and 14 and SEGs 8 to 11 plus SEG 15 were coded into a comparison category comprising intermediate and manual occupations. Only those currently employed were included in the analysis.

Unemployment The economic activity variable was coded to two categories: "employed" and "unemployed or economically inactive".

Skills improvement:

Writing, computing (solving problems using a computer), maths (solving mathematical problems), organising, instructing, advising and counselling/caring. These variables were coded as "improved" (in last ten years) vs "no change", "got worse" and "don't have skill".

Health and vulnerability:

General health was coded to two categories "excellent" vs "other", which included good, fair and poor. The same variable was available on BCS70 and NCDS Sweep 4 (1981).

Psychological state (depression). This was based on a continuous scale comprising 24 items (the "Malaise" inventory). The cut-point was 7, with those scoring 8 or more categorised as "depressed".

Accidents was coded to two categories, "had suffered at least one accident or assault in the previous ten years", vs "had not".

Marital violence was based on a question asked to separated or divorced respondents on whether or not they had suffered a physical assault from their partner.

Parenting:

Two variables were used: 1) whether or not parents reported their children as having basic skill problems, such as writing or reading, and 2) the number of books owned by their children, coded into two categories – over and under 50 books.

Civic participation

Voting: Respondents who reported having voted less than four times in local or general elections at age 33 were categorised as "low" voters, while those reporting having voted four or more times were categorised as "high".

Voluntary organisation membership: Those people who reported past or current membership of any community, voluntary or charitable organisation were categorised as involved in two separate variables reflecting past membership and current membership.

Table 2a continued

Attitudes

Support for gender and race equality, political cynicism

These variables were continuous scales obtained by aggregating the scores across sets of opinion items to each of which the response categories were “strongly agree” (1), “agree” (2), “can’t decide” (3), “disagree” (4), “strongly disagree” (5), adjusting the direction of scoring as appropriate. They were derived by the NCDS team using factor analysis, and were constructed so that values fall between 1 and 5.

Items

Note: Percents in brackets are the percentages of all NCDS respondents at age 33, who expressed the opinion in the direction of the attitude; e.g. 69% agreed that “men and women should do the same jobs around the house” – i.e. supported *gender equality*.

Support for gender equality

“There should be more women bosses in important jobs in business and industry” (64% agree);
“If a child is ill and both parents are working it should usually be the mother who takes time off to look after the child” (48% disagree);
“Women should have the same chance as men to get some training or have a career” (97% agree);
“Men and women should do the same jobs around the house” (69% agree);
“When both partners work full-time, the man should take an equal share of the domestic chores” (93% agree);
“I would not want a woman to be my boss” (78% disagree);
“It is less important for a woman to go out to work than it is for a man” (64% disagree).

Support for race equality

“It is alright for people from different races to get married” (80% agree);
“I would not mind if my child went to a school where half of the children were of another race” (52% agree);
“I would not mind working with people from other races” (90% agree);
“I would not want a person from another race to be my boss” (79% disagree);
“I would not mind if a family from another race moved in next door with me” (67% agree).

Political cynicism

“Politicians are mainly in politics for their own benefit and not for the benefit of the community” (39% agree);
“It does not really make much difference which political party is in power in Britain” (29% agree)
“None of the political parties would do anything to benefit me” (20% agree)

Table 2b: Control variables

Childhood characteristics

Father's occupation at age 16: This variable was pre-coded into socio-economic groups. SEGs 1 to 5, and SEG 13 were coded as "service" class (professionals, lower professionals, managers and supervisors). SEGs 6, 7, 12 and 14 were coded as "intermediate" and SEGs 8 to 11 and SEG 15 were coded as "manual".

Mother's education: This was coded as completing by age 15 vs completing aged 15 plus.

Parental interest in child's education: This was coded as "very interested", if either parent was judged as "very interested" as against "not interested". In practice the variable was corrupted and is a very weak indicator of parental interest.

Free school meals: This was coded according to whether or not the child received free school meals at age 11.

Over-crowding: Households with more than 1.5 people per room were coded as "over-crowded" (at age 11).

Cognitive skill: Tests of cognitive skills at age 11 (verbal and non-verbal ability) were coded into three categories; "low", "mid-range" and "high".

Ethnicity

Dummy variables were constructed identifying "White", "Afro-Caribbean", "Asian" and "Other" ethnicity.

Employment characteristics

Not working: Periods of unemployment were coded as "none", "up to one year", "one to three years" and "three or more years". Full-time housework was coded as "none", "up to three years", "four to six years" and "seven or more".

Occupation: This is based on Standard Occupational Classification in a manner analogous to that used by Robinson and Manacorda (1997). However, the categorisation is more finely detailed for graduate occupations (see Appendix 2).

NCDS 1995

Partner's education was based on the age of completing full-time education and was coded as "up to 16", "17-19" and "20+".

Number of children: because of low frequencies, numbers of children above three were coded with "three children" into a "three or more" category.

Age of the oldest child was fitted as a continuous variable.

BCS70

Father's occupation at age 16: This variable was pre-coded into Registrar-General's social class. Classes I and II were coded as "service" class (professionals, lower professionals, managers, and supervisors and technicians). Class IIINM was coded as "clerical" and Classes IIIM, IV and V were coded as "manual".

Mother's education: This was coded as completing by age 15 vs completing aged 15-plus.

Free school meals: This was coded according to whether or not the child received free school meals at age 10.

Over-crowding: Households with more than 1.5 people per room were coded as "over-crowded" (at age 10).

Cognitive skill: Standardised scores on tests of reading and maths at age 10 were added together and the summed score was coded into three percentiles, "low" "mid-range" and "high".