Social origins, school type and higher education destinations

Abstract: To what extent and why do social origins matter for access to higher education, including access to elite universities? What is the role of private and selective schooling? This paper uses the 1970 British Cohort Study (BCS70) to analyse the trajectories of a generation currently in early middle age. We find that the influence of social origins, especially parental education, remains when both a wide range of cognitive measures and school attainment are controlled. Attending a private school is powerfully predictive of gaining a university degree, and especially a degree from an elite institution, while grammar schooling does not appear to confer any advantage.

Authors:

\*Alice Sullivan, Institute of Education, University of London

Samantha Parsons, Institute of Education, University of London

Richard Wiggins, Institute of Education, University of London

Anthony Heath, University of Manchester

Francis Green, Institute of Education, University of London

\*Corresponding author

Address:

Centre for Longitudinal Studies

55-59 Gordon Square

LONDON

WC1H 0NU

Email: [a.sullivan@ioe.ac.uk](mailto:a.sullivan@ioe.ac.uk)

Tel: 020 76126661

Sullivan, A., Parsons, S., Wiggins, R. and Green, F. (in press 2014) *Social origins, school type and higher education destinations.* Oxford Review of Education (40th anniversary special edition).

Social origins, school type and higher education destinations

Abstract: To what extent and why do social origins matter for access to higher education, including access to elite universities? What is the role of private and selective schooling? This paper uses the 1970 British Cohort Study (BCS70) to analyse the trajectories of a generation currently in early middle age. We find that the influence of social origins, especially parental education, remains when both a wide range of cognitive measures and school attainment are controlled. Attending a private school is powerfully predictive of gaining a university degree, and especially a degree from an elite institution, while grammar schooling does not appear to give any advantage.

# Introduction

Origins and Destinations (1980) examined socio-economic inequalities in educational outcomes for a sample of men living in England and Wales in 1972. As well as charting educational inequalities in the context of the selective ‘tripartite’ education system, Halsey et. al. engaged empirically with the most influential theories of the day within the sociology of education: Boudon’s primary and secondary effects framework, and Bourdieu’s theory of cultural reproduction. It’s notable that, at least as far as quantitative sociology is concerned, these are still amongst the most influential theoretical perspectives being used today, over thirty years later. Origins and Destinations was a seminal work because it took on one of the fundamental questions in the sociology of education: to what extent and why do social origins matter in the education system? This paper addresses the same essential issues using data on men and women born Britain in 1970 (the 1970 British Cohort Study (BCS70)).

## Schools and educational inequalities in Britain

The British birth cohort studies have played a large part in recent debates on the role of schooling in educational attainment and social mobility (Blanden et al. 2004; Blanden et al. 2005; Boliver & Swift 2011; Goldthorpe & Jackson 2007; Goldthorpe & Mills 2008; Gorard 2008). Conservatives have blamed the decline in grammar schooling for a decline in social mobility chances, though it has been shown that the benefits of attending grammar school for the 1958 cohort (National Child Development Study, (NCDS)) were balanced by the disadvantages of attending a secondary modern school (Boliver & Swift 2011) and recent analysis has shown that selective school systems increase earnings inequality in adult life (Burgess et al. 2014).

Several studies have examined school differences using the 1958 cohort (Clifford & Heath 1984; Cox & Marks 1980; Dearden et al. 2002; Feinstein & Symons 1999; Heath & Jacobs 1999; Kerckhoff et al. 1996; Kerckhoff & Trott 1983; Marks et al. 1983; Steedman 1980; 1983a; b; Sullivan & Heath 2003). Controlling for relevant confounders, private and grammar pupils achieved significantly higher exam results at age 16 than their peers at comprehensives, while those at secondary moderns fared significantly worse (Sullivan & Heath 2003). Private schools have been shown to be linked to a strong earnings advantage in later life in Britain (Green et al. 2011). The long range influence of selective schooling on income has also been established for the ‘Aberdeen Children of the 1950s’ study (Clark & Del Bono 2014).

The NCDS respondents were a distinctive cohort, which experienced both the raising of the school leaving age in 1973 and the transition from a ‘tripartite’[[1]](#endnote-1) system, with selection at age 11, to a system of comprehensive schools catering for all abilities. The implementation of comprehensivisation was gradual and geographically uneven (Kerckhoff et al. 1996). Many of the comprehensive schools attended by this cohort were effectively just re-named secondary moderns, with neighbouring grammar schools. By 1986, while some grammar schools remained, and some politically Conservative areas (such as Kent) held out entirely against comprehensive schools, the comprehensive system was well established in the majority of Local Education Authorities (LEAs). Therefore, using BCS70, we are able to examine outcomes for a cohort who experienced a comprehensive system which was no longer in its infancy.

As well as a changed school system, the 1970 cohort experienced a different higher education landscape from the 1958 cohort. In 1978, when the 1958 cohort members were 20 years old, the age participation index (API) for young people in higher education was 14% for men and 11% for women. Twelve years later in 1990, an almost equal proportion of men (20%) and women (19%) were going on to higher education (Source: DfE). The system of funding students’ living expenses was changing, with the introduction of student loans in 1990, accompanied by the phasing out of maintenance grants. Tuition fees were brought in much later, in 1998, so BCS70 school leavers still had access to free higher education. A dramatic expansion of student numbers was sparked by the 1992 Higher Education Act which abolished the divide between polytechnics and universities. This was too late for BCS70 school leavers in 1988, who would still have been constrained by the low number of higher education places available, but it may have opened up opportunities for adult higher education.

Despite the abolition of the university/polytechnic divide, status differentials between British universities have certainly not diminished in importance. The theory of maximally maintained inequality (Lucas 2001) suggests that as higher education systems expand, inequalities will be maintained via status distinctions between institutions and courses. Given the link between elite universities and elite jobs, the question of access to the top universities remains controversial, particularly in relation to private schooling (Zimdars et al. 2009). Concern has focussed on the extent to which the domination of elite universities by the privately educated simply reflects potentially ‘meritocratic’ factors such as examination results, and the extent to which other factors such as discrimination by the institutions themselves, poor advice from state schools, or self-exclusion may play a role.

## Unpacking family background inequalities in education

For Bourdieu, cultural, rather than economic resources are fundamental to determining educational inequalities (Bourdieu & Passeron [1977] 1990). Bourdieu’s theory of cultural reproduction has been operationalised in various ways, but increasingly researchers are critical of a narrow interpretation of cultural capital as consisting in ‘beaux arts’ elite cultural activities, and suggest that cultural capital should be seen as including knowledge and skills which are rewarded within the education system (Crook 1997; De Graaf et al. 2000; Farkas 2003; Ganzeboom 1982; Lareau & Weininger 2003; Sullivan 2001). Previous studies have found that books in the home and reading behaviour, but not ‘beaux arts’ participation, help to explain social differentials in children’s educational outcomes (De Graaf et al. 2000; Sullivan 2001). We have argued that reading is distinctive because it develops linguistic ability and wider cultural knowledge (Sullivan 2002; 2007). Although Bourdieu’s theory has been criticised for its vagueness, we would defend the usefulness of distinguishing between educational and cultural resources on the one hand and economic resources on the other.

Boudon (1974) makes an important distinction between the ‘primary’ and ‘secondary’ effects of social stratification, later developed and formalised by Breen and Goldthorpe (1997). The ‘primary effects’ of stratification are defined as cultural inequalities that determine the academic abilities of pupils. *‘The lower the social status, the poorer the cultural background – hence the lower the school achievement…’* (Boudon 1974:29). The ‘secondary effects’ of stratification are due to the different costs and benefits that are associated with different educational decisions for students from different social classes. These educational decisions occur at key transition points, such as the move from secondary to post-secondary education. According to Boudon, the secondary effects of social stratification are due to economic inequalities. An important assumption is that individuals act in accordance with the goal of avoiding downward social mobility. For example, the increased risk of downward social mobility due to not doing a degree is far greater for the child of a doctor than for the child of a plumber. It is claimed that the secondary effects of social stratification are more important than the primary effects because they are exponential, with each subsequent transition in the education system increasing the level of inequality. Interestingly, recent research shows that ethnic minority status works in the opposite direction to classic ‘secondary effects’ in Britain, leading to increased participation by minorities at any given level of attainment (Waters et al. 2014), which raises some interesting questions about Boudon’s theory.

Evidence has been presented for the continued importance of secondary effects (Jackson 2013; Karlson 2013). However, one problem with research to date in this field is the difficulty of capturing initial attainment in the education system in a way that differentiates sufficiently between individuals. This is vital given that the secondary effects of social stratification are defined as direct impact of social class inequalities on educational outcomes which remains once initial educational attainment is accounted for. Weakly differentiated attainment measures leave a question mark over whether the secondary effects of stratification have been overestimated and the primary effects underestimated. This problem is compounded in the case of the 1970 cohort (and earlier generations) due to the high proportion of young people who left school with no qualifications at all.

Although Boudon’s distinction between the primary and secondary effects of stratification is useful, there are some major difficulties with this framework which we address in our analyses.

First, the primary effects of stratification are seen as being reflected in students’ ability and are therefore seen as a ‘given’ or constraint, whereas the secondary effects reflect choices made by students and their families. This is problematic, because measured ‘ability’ varies over time, and is itself affected by the actions and investments of the child and family in the child’s education. The development of educational inequalities cannot be adequately understood without taking this into account. The last decade has seen an increased focus on the role of the early years of a child’s life in determining educational inequalities and social mobility chances, both in policy discourse and in research (Feinstein 2003; 2004)(Kiernan & Mensah 2011; Sullivan et al. 2013; Sylva et al. 2004). Feinstein’s (2003) work on the 1970 cohort has been critiqued (Jerrim & Vignoles 2013), but has been highly influential in directing policy attention to the early emergence of and growth in cognitive inequalities between children from advantaged and disadvantaged homes. The focus on the secondary effects of stratification has contributed to a neglect of cognitive development by sociologists – this effectively implies a focus on transition points at the expense of ignoring the impact of individual learning trajectories between these points. On the other hand, the current policy focus on the early years raises important questions about the extent to which later inequalities are actually determined by early cognitive development.

Second, the primary effects of stratification are presented as being culturally determined, whereas the secondary effects are determined by economic status. However, cultural as well as economic factors are likely to affect educational decision-making (Gambetta 1987, Hatcher, 1998, Lynch and O’Riordan, 1998). These cultural factors may for example include knowledge of the education system, or beliefs about one’s own ability (Sullivan 2006). More generally, the question of whether economic or cultural factors are more important in explaining social differentials in educational attainment can be seen as distinct from the question of whether the primary effects of social stratification are greater than the secondary effects. We cannot assume that economic factors have no impact on performance before any key transitions have been made (i.e. on ‘primary’ inequalities in attainment), or that cultural factors do not affect the decisions made regarding these transitions (i.e. at the level of ‘secondary’ effects).

Third, the primary/secondary framework tends to assume a system of clear branching points, occurring at fixed time points, and setting individuals on neatly diverging trajectories. This framework works quite well when examining a particular educational transition for young people, but is less well suited to the analysis of the relatively untidy accumulation of qualifications during the life course. It also tends to lead to a neglect of processes which have occurred before what are deemed to be key branching points, and in particular of the years before secondary school.

A fourth complication, which we do not address here, is that expectations regarding future educational trajectories may influence current effort at school, which in turn is likely to influence attainment (Cameron & Heckman 1998).

In this paper we use a life course approach, taking into account cognitive trajectories and differentiating between cognitive scores at a range of ages and qualifications at the end of compulsory schooling. We know that social background is a major influence on both test scores and educational attainment (Marks 2005). Cognitive scores reflect aspects of intellectual development, while qualifications may also reflect such factors as an understanding of the ‘rules of the game’ of doing well in particular high-stakes examinations, as well as opportunities to be entered for particular examinations in the first place. Including both cognition and credentials in our model allows us to unpack these different factors, and assess the degree to which cognitive differences are captured by school qualifications. However, it is important to acknowledge that factors such as people’s levels of motivation and compliance, as well as potential stereotype-threat (anxiety due to the potential to confirm a negative stereotype about one’s social group) (Croizet & Claire 1998; Spencer et al. 1999) will affect their scores in cognitive tests. We also acknowledge that multiple-choice tests do not capture the full range of academic competencies. For example girls tend to fare worse relative to boys in multiple-choice tests than in forms of assessment requiring written answers (Gipps & Murphy 1994). We do not interpret the tests used here as providing an estimation of innate intelligence. They are simply tests of attainment based on the capability and motivation to complete a particular task under given conditions.

# Research questions

We examine the chances of gaining either an elite (Russell Group)[[2]](#endnote-2) undergraduate degree, or an ‘ordinary’ university undergraduate degree by age 42. Access to elite universities has not previously been examined using nationally representative longitudinal data. We address the following questions:

1. To what extent are social inequalities in access to higher education determined during the early years and captured by early cognitive scores?
2. Is the type of secondary school attended linked to chances of gaining a degree or elite degree?
3. To what extent is the effect of socio-economic advantage mediated (i.e. explained) by the type of secondary schooling children have received?
4. To what extent is any apparent influence of schooling captured by cognition up to age 16 and examination performance at the end of compulsory schooling, and to what extent does any school based advantage or disadvantage extend beyond this?
5. Are there effects of social origins on degree and elite degree attainment once we allow for cognition and initial qualifications? If so, are these ‘secondary effects’ primarily due to economic rather than educational and cultural resources as Boudon’s theory suggests?

# Data and Methods

The 1970 British Cohort Study (BCS70) follows the lives of more than 17,000 people born in England, Scotland and Wales in a single week of 1970 (Elliott & Shepherd 2006). Over the course of cohort members’ lives, the BCS70 has collected information on health, physical, educational and social development, and economic circumstances among other factors. Since the birth survey in 1970, there have been eight surveys (or ‘waves’) at ages 5, 10, 16, 26, 30, 34, 38 and 42. An understanding of the educational progress of this cohort during their childhood is vital to understanding their later life course trajectories.

The age 16 survey employed sixteen separate survey instruments, and unfortunately coincided with a teachers’ strike which affected the completion of those instruments, including cognitive tests, that were administered via schools (Dodgeon 2008). This led to substantial instrument non-response, though the overall response and representativeness of the sample at this wave was good (Mostafa & Wiggins 2014). The lack of adequate secondary school data has prevented researchers from examining the effects of schooling on the 1970 cohort to the same extent as has been achieved with the 1958 cohort. This has left gaps in the understanding of the trajectories of the generation who attended secondary school in the 1980s. This paper is the first output from an ESRC project which sets out to repair the secondary school data, and extract previously unused cognitive variables. We will deposit these school and cognitive variables for wider use during the course of the project.

Because we exploit data from all of the childhood waves of the study, including the age 16 wave, the problem of missing data must be addressed. Levels of missing data for the variables used in our analysis are provided in table 1. As list-wise deletion was not a practical option, we use multiple imputation to ‘fill-in’ values of any missing items in the variables selected for our analysis adopting Schafer’s algorithm under the assumption of ‘missing at random’ (MAR). In order to strengthen the MAR assumption and to protect against departures from multivariate normality we included a set of auxiliary variables in our imputation model (Schafer 1997). Our analytical sample of 7,767 includes all cohort members resident in England and Wales in 1986 with a full set of birth characteristics, who participated in the age 42 survey and had degree and school type information. Cohort members resident in Scotland were excluded because of Scotland’s distinct system of qualifications. All reported analyses are averaged across 20 replicates based upon Rubin’s Rule for the efficiency of estimation under a reported degree of missingness across the whole data of around 0.20 (Little & Rubin 1987).

The outcome or dependent variable is degree attainment by the age of 42, summarised in three categories (no degree/ degree/ elite degree). This is based on a retrospective question asked at the age 42 survey in 2012. This asked respondents who had a degree which institution they received their first degree from. This information was not available in previous waves of the study. Our measure of an elite university is based on the Russell Group[[3]](#endnote-3) of universities, which promotes itself as representing the leading UK universities (Boliver 2013)[[4]](#endnote-4). We acknowledge the element of arbitrariness in this measure. We considered a more restrictive definition of elite higher education (e.g. Oxbridge) but this would have led to insufficient numbers for robust analysis. We include anyone gaining a degree awarded by a polytechnic within the ordinary degree category.

We use multinomial logistic regression to model the log odds of falling into categories of the dependent variable for various linear combinations of our explanatory or predictor variables (Agresti 2002). We exploit the longitudinal nature of the data by presenting a series of models introducing childhood attainment at 5, 10 and 16 sequentially. BCS70 is particularly rich in measures of cognition. We exclude the cognitive measures that were administered to a random subsample of 10% of cases at 22 months and 42 months but make use of the full set of cognitive tests at the ages of 5, 10 and 16. We use varimax Principal Components Analysis (PCA) (Krzanowski, 1988) to extract a single main component score for cognition using all available tests at each age. Cronbach’s Alpha for these age-specific measures ranged between 0.6 and 0.9 (Parsons 2014 in press).

Our modelling strategy unfolds across six models (numbered 1 through 6) which capture distinct stages of the life course in cumulative manner. Model 1 begins with an account of cohort member characteristics at birth as well as indicators of economic, cultural and parental educational background. The measures of cultural resources we use here reflect the importance of books and reading in previous research on cultural capital. Model 2 adds cognitive scores at age 5 years, and model 3 adds cognitive scores at age 10. Model 4 includes secondary school type, and model 5 includes cognitive scores and ‘point scores’ for attainment in public examinations at age 16. The final model includes post-compulsory academic qualifications. The detail of the content of these predictor variables as they are introduced under each modelling phase is described below:

**Model 1: Birth characteristics and family background**

***Birth characteristics***

Sex (1970)

Birth weight (1970): Low birth weight is an indicator of prenatal disadvantage (Power et al. 1991).

Position in birth order (1970): Parity is a well-established predictor of educational chances, with an advantage for children higher up the birth order (Nisbet 1953).

Age of mother at first birth (1970): Young motherhood is linked to disadvantaged maternal social origins (Robson & Pevalin 2007). The children of older mothers have an advantage in cognitive development (Hawkes & Joshi; 2012).

We do not include ethnicity as a category in this analysis, as the proportion of ethnic minorities in BCS70 is very low. Similarly, we do not consider single-parent status at birth due to low numbers. Within our sample, 2.5% of cohort members with ethnicity information were from a minority ethnic group and 3.7% lived in a single parent household (1.4% widowed, separated or divorced, 2.3% single never married).

***Education and cultural resources***

Parents’ highest qualification (1975): coded as mother’s or father’s whichever is highest.

Frequency of reading to the child (1975): mothers were asked on how many days of the last seven the child had been read to.

Newspapers in the home (1986): tabloid/ broadsheet/ both/ no national newspapers. The prose style of tabloids was simpler and geared towards a lower reading age and smaller vocabulary than the broadsheets. During the 1980s, newspaper readership was high, and the type of newspaper read was a strong cultural identifier (Chan & Goldthorpe 2007) . Although this variable was captured when the cohort member was age 16, we consider that tabloid or broadsheet readership is a stable characteristic and would be unlikely to be subject to significant change during the preceding years of the cohort member’s life.

***Economic resources***

Occupational social class (1970): We use the Registrar General’s classification, as NS-SEC (Goldthorpe 1997) is not available for 1970.

I Professional occupations

II Managerial and technical occupations

III Skilled non-manual occupations

III Skilled manual occupations

IV Partly-skilled occupations

V Unskilled occupations

We use the highest occupation based on either the mother or father’s current or most recent job. Non-working mothers are grouped with the reference social class if this is the only information available (this is a small group). We considered using both mother’s and father’s class as separate variables, but decided against this approach as many mothers had not supplied any occupation information (8.2%) or were not in paid employment (37.7%). .

Home ownership (1975): Home ownership is an important indicator of wealth.

Overcrowding (1975): The ratio of people in the household per room (excluding kitchens and bathrooms). More than one person per room is indicative of living in overcrowded conditions.

**Model 2: Model 1 + age 5 cognition**

At age five the children took the following five tests. **Copying designs**: An assessment of visual-motor co-ordination (Rutter et al. 1970); **English picture vocabulary** (Brimer & Dunn 1962); **Human figure drawing** (draw-a-man)and **Complete a profile**: Intended to reflect conceptual maturity (Goodenough 1926; Harris 1963); **Schonell graded reading** (Golding 1975).

Model 3: Model 2 + age ten cognition

Eight cognitive tests. **Shortened Edinburgh Reading Test** (Godfrey Thompson Unit 1978); **Pictorial language comprehension test**; **Friendly maths test**; **Spelling**; **British Ability Scales** (BAS) (Elliott et al. 1979; Hill 2005): Two verbal subscales (**word definitions** and **word similarities**) and two non-verbal subscales (**digit recall** and **matrices**) (Butler et al. 1980).

**Model 4: Model 3+ Secondary school type**

School type (1986): Comprehensive, grammar, secondary modern, private or special needs. We have combined data from three sources: the 1986 Headteacher’s Questionnaire; the 1986 Schools Census and a retrospective question asked in 2012. Where the headteacher variable was missing we used the 1986 schools census variable, and where both sources were missing we used the retrospective 2012 variable.

**Model 5: Model 4 + cognition and qualifications at 16**

Cognitive tests: In 1986, the BCS70 cohort members took nine cognitive tests, but, due to lack of funds, only two, spelling and vocabulary, were initially deposited, with arithmetic deposited more recently (Closs & Hutchings 1976; Dodgeon 2008). As part of a current ESRC project, we have now inputted the data from the six remaining cognitive tests, and the analysis presented here is the first to include all nine cognitive tests.

Examination results at age 16 (1986): We derive a total points score from all O level and CSE examinations. An O Level grade A is awarded 7-points, grade B 6-points, continuing to a grade E being awarded 3 points. A CSE grade 1 is equivalent to an O Level grade C and is awarded 5-points, a grade 2 4-points, etc. The lowest CSE grade is grade 6, which is awarded 1-point. We also include separate binary variables to indicate whether a cohort member had a maths or English O Level grade A-C or a CSE grade 1.

Model 6: Model 5 + A level qualifications by age 20

A levels were the main qualification for university entry for this cohort. They were typically taken at age 18, but we include qualifications up to age 20 to allow for re-takes. We compare those with no A levels to those with three or more A-C grades, one or two A-C grades, or lower grades only. Note that British qualifications have been subject to substantial grade inflation since the abolition of norm-referenced marking in the 1990s, but for this cohort, it was still possible to get a place at a Russell Group university with C and D grades at A level (O' Leary & Cannon 1993)[[5]](#endnote-5).

# Analysis

Table 1 shows descriptive information for the variables used in our analysis, broken down by school type. The analytical sample includes only cases with full information on the birth characteristics, school type and degree outcomes at age 42. This gives us an imputed sample of n=7, 767.

A clear hierarchy of schools emerges from the descriptive data, both in terms of socio-economic background and cognition and qualifications, with private schools at the top of the heap, followed by grammars, then comprehensives, and finally secondary moderns. For example, 52% of privately educated cohort members had at least one graduate parent, compared with 31% of grammar pupils, 14% of those who attended comprehensives, and 8% at secondary moderns. Turning to the outcome variable, 16% of the sample achieved ‘ordinary’ degrees, and a further 7% achieved elite degrees. This varied greatly by school type: 31% of privately educated cohort members achieved an elite degree, compared to 13% of grammar pupils, 5% of comprehensive pupils and 2% of secondary modern pupils.

TABLE 1

Table 2 shows a correlation matrix of all cognitive and educational measures used in our models. Correlations range between 0.28 (for cognition at age 5 and A levels) and 0.68 (cognition at 10 and cognition at 16).

TABLE 2

Table 3 shows a series of multinomial logistic regressions predicting the odds of achieving an elite degree or an ordinary degree compared to no degree by age 42. Ordinal regression was considered, but the proportional odds assumption did not hold.

TABLE 3

Model 1 shows the cohort member’s birth characteristics, and the family’s resources, divided into cultural and educational resources (Parents’ educational level, newspaper readership and reading to the child) and economic resources (occupational social class, home ownership and overcrowding).

There was no statistically significant difference between male and female cohort members in this model. Birth weight was not significant. Older mothers were associated with a strong and significant advantage in both gaining a degree and an elite degree, while there was no significant difference in degree chances according to birth order.

Parents’ education is highly significant. Cohort members with a graduate parent had over three times the odds of those with parents with no qualifications of gaining a degree, and 5.5 times the odds of gaining an elite degree. Having tabloid newspapers in the home compared with having no national newspapers in the home lowered the relative odds of gaining a degree whereas having broadsheets in the home raised the relative odds, with larger differentials for elite degrees than for ordinary degrees. The frequency of parents reading to the cohort member in childhood was also highly significant, with a larger premium in the case of elite degrees.

Surprisingly, only the top social class category was significantly linked to elite degree chances, and social class was not a significant predictor of getting a non-elite degree. Home ownership raised the relative odds of gaining a degree or elite degree, and overcrowding was associated with reduced odds of gaining an elite degree.

In model 2, we introduce cognition at age 5, which is a standardised score extracted from a Principal Components Analysis. Cognition at age 5 is powerfully linked to the relative odds of gaining an ordinary degree, with a larger differential in the odds of an elite degree. A single standard deviation increase in the score translates into 1.6 times the odds of a degree and 1.9 times the odds of an elite degree over not gaining a degree. Introducing early cognition partially mediates the influence of the birth characteristics and home background, and social class becomes non-significant in this model. However, while the coefficients of the variables measuring cultural and educational resources and economic resources are generally somewhat reduced, they remain substantial and significant overall. For example, the advantage in elite degree chances due to having a graduate parent is reduced slightly from an odds ratio of 5.5 to 4.5.

Model 3 introduces cognition at age 10. This is more powerfully predictive of higher education chances than cognition at 5 (odds improved by 2.2 for a degree and 3.4 for an elite degree). Nevertheless, the age 5 tests remain highly significant in this model. The inclusion of both cognitive scores reduces the advantage due to reading to the child to insignificance, suggesting that the influence of reading to the child at age 5 is fully mediated by cognitive attainment by age 10.

Model 4 introduces the type of secondary school attended. Private schooling is powerfully linked to degree chances. Compared to their peers at comprehensives with similar backgrounds and cognitive attainment at age 5 and 10, privately educated cohort members had 1.7 times the odds of gaining an ordinary degree, and over three times the odds of an elite degree. In contrast, there was no statistically significant advantage of attending a grammar school or disadvantage of attending a secondary modern school Differentials due to the cohort member’s home resources, both economic and educational/cultural, are only modestly attenuated by school type, which makes sense given the very small proportion of children who attended private schools (5% of the sample).

In this model, we tested whether there were interactions between school type and: cognition at age 10, parents’ social class, and parents’ education. This was in order to investigate whether particular school types were more or less advantageous for pupils with different characteristics. For example, were grammar schools especially beneficial for those working class pupils who attended them, even if there was no overall grammar school advantage? However, we found no statistically significant interactions, suggesting that the advantage or disadvantage of attending each type of school was similar for pupils of different backgrounds and prior attainment levels.

Model 5 brings age 16 cognition and examination performance into the model. Cognition, overall O level scores (standardised), and maths and English O level grades are all independently linked to degree chances. Achieving maths O level was linked to particularly strongly improved odds of an elite degree (OR=2.6). Although cognition at younger ages is partially mediated by later cognition, cognition at age ten remains powerfully significant in this model. This may partly reflect the fact that different tests were used at each age, so that measurement error at any given age is partially accounted for by the cognition measures at the other ages. The advantage due to attending a private school is only modestly attenuated in this model. We checked for an interaction between age 16 attainment and school type but found none.

The remaining direct influence of social origins in this model reflects the secondary effects of stratification, as the primary effects on initial attainment within compulsory schooling have already been accounted for. Of our three measures of economic resources, only home ownership remains statistically significant in the expected direction in this model. The advantage associated with home ownership was similar for gaining an ordinary or elite degree. Turning to educational and cultural resources, having broadsheet newspapers in the home became insignificant in this model, though tabloid newspapers in the home remain significantly linked to reduced odds of both a degree and an elite degree. Parental education remains highly significant, though reduced. A graduate parent is linked to 1.7 times the odds of gaining a degree and 2.5 times the odds of an elite degree. It is interesting that these ‘secondary effects’ due to parental education are greater than those due to home ownership, and that parental education has a greater influence on the chances of an elite degree than an ordinary degree, whereas home ownership is linked to a similar advantage for both types of degree. It is likely that graduate parents’ greater knowledge of the higher education system, and of the importance of status differentials within this system will have played an important role here.

Model 6 introduces examination performance at A level, and therefore tests whether the remaining home and school differences can be explained by differential rates of staying on and performance in further education. In fact, this is not the case, as the pattern of results remains broadly similar to that observed in the previous model, though with somewhat reduced differentials. Cohort members with graduate parents had 1.6 times the odds of a degree and 2.1 times the odds of an elite degree compared to cohort members with the same A level results whose parents had no qualifications. Private school cohort members had 1.4 times the odds of a degree and 2.5 times the odds of an elite degree compared to those at comprehensives with the same A levels. These large differences are clearly non-meritocratic in that they are robust to a full set of controls for cognition and examination results.

# Discussion and conclusions

This paper has presented a life course analysis of the social origins and higher education destinations of the generation born in Britain in 1970. Strengths of the paper include full exploitation of the rich cognitive data available in BCS70, and use of Multiple Imputation to allow the incorporation of the age 16 data. We have been able to use retrospective data from the latest wave of the study and historical administrative data to fill in information on the types of schools attended by the cohort members in their teenage years. We have used data from the latest wave of BCS70 to examine the type of university attended, providing a more refined analysis of attainment at degree level than has previously been possible using birth cohort data.

Limitations of the current paper include the fact that we have not accounted for diversity within each school sector. In addition we have not investigated potential differential effects of school type according to gender, and the role of single-sex schools. We will address these issues in future papers.

Our first question was about the extent to which social inequalities in access to higher education are determined during the early years and captured by early cognitive scores. We found that cognitive scores at age 5 mediate the effects of the home background, but far from fully. Similarly, including cognition at age 10 leaves robust and substantial differentials intact for such characteristics as parental education and home ownership. We found that early cognitive differentials are very important and have far-reaching effects. Cognition at 5 and 10 independently predict degree chances even controlling for cognitive and school attainment at 16. But cognitive differences in early and mid-childhood by no means fully account for later inequalities. This has important policy implications. A strong focus on the early years may be important, but there is a risk that this can be exaggerated, leading to unwarranted pessimism about the scope for intervention later on.

Our second question was about the extent to which school type was linked to the chances of gaining a degree or elite degree, controlling for prior cognition, birth characteristics, educational/cultural and economic resources. We found a powerful advantage associated with private schooling, especially in the case of gaining an elite degree. Of course, this advantage is not necessarily causal. Although we have controlled for a raft of social background characteristics and cognitive attainment at 5 and 10, there are likely to be unobserved differences between parents who send their child to a private school and those who don’t, including the level of motivation and ambition regarding education, as well as differences in political outlook linked to attitudes towards ‘getting on’ in life. Surprisingly, grammar schooling was not linked to any significant advantage in getting a degree. Note that the lack of a grammar school advantage in degree chances does not imply that grammar schools made no difference to attainment within compulsory schooling. Indeed, our preliminary investigations (not shown) suggest that grammar schools did make a difference at O level, but this did not follow through to university chances. This ‘leaky pipe’ between grammar school attainment and university entrance warrants further investigation. In future work, we will investigate the characteristics of these schools in detail, including the degree of academic selectivity, as it may be that some grammar schools attended by this cohort were no longer highly selective institutions.

Third, we asked to what extent social background differentials in access to higher education were mediated by the different types of schools attended. The answer is that the background differences were only slightly mediated by secondary school type, despite the large advantage associated with private schooling. We also tested whether school differentials were moderated by pupils’ social class, parents’ education, and prior cognitive attainment, but found no significant interactions. The fact that grammar schools provided no special benefit for working class pupils’ higher education chances is important in the light of current debates on schooling and social mobility.

Fourth, we asked to what extent any apparent influence of schooling on degree chances was fully captured by cognition and qualifications. The private school advantage is only very slightly reduced by including attainment at age 16 in the model, suggesting that it was driven less by attainment at 16, and more strongly by post-16 factors. The private school advantage is partly explained by A level attainment, but a substantial unexplained differential remains. This may be explained by factors such as the level of aspiration (both of the parents and the schools) and links between the universities and the private schools – particularly salient in the case of the elite universities and a small number of elite private schools. We will investigate some of these mechanisms further in future work. We can say though that the view that the domination of elite universities by the privately educated was justified by the concentration of the pool of talent in such schools is not justified by our analysis. Our findings accord with longstanding results showing that state educated pupils outperform their comparably qualified privately educated peers once at university (Hefce 2014; Smith & Naylor 2001).

Fifth, we asked whether there are ‘secondary’ effects of stratification on degree chances, controlling for cognition throughout childhood as well as examination attainment at 16. We found a significant robust association with home ownership, and especially with parental education, despite that fact that we control for childhood cognition in a more thorough way than previous studies. The advantage associated with having a highly educated parent is greater in the case of chances of gaining an elite degree, rather than an ordinary degree. There was no significant secondary effect due to social class. This does not support Boudon’s view that the secondary effects of stratification are driven primarily by the economic position of the household. Rather, we find that parental educational status is the largest source of secondary effects.

Our analysis supports the view that simply looking at access to higher education, rather than acknowledging status differentials within higher education, will tend to lead to an underestimation of social inequalities in access. This is likely to be even truer for the current generation than it was for the 1970 generation, given the great expansion of UK Higher Education and increased diversity of universities and courses since 1992. Boliver (2013) has shown that pupils from lower social class backgrounds are still less likely to apply to Russell Group institutions than comparably qualified pupils from higher class backgrounds, and that state school applicants are less likely to apply and to be awarded a place if they do apply compared to private school pupils.

In summary, an individual’s cognitive attainment throughout childhood and adolescence is very important to their higher education chances, but being bright is not necessarily enough. Advantaged social origins and private schooling raise the chances of getting a degree, and especially an elite degree, above and beyond cognitive and examination attainment. Given the domination of Britain’s ruling class by graduates of private schools and elite universities, these non-meritocratic processes have important repercussions.

*Acknowledgements:* Many thanks are due to the BCS70 cohort members for their contribution over many years. This work was funded as part of an ESRC project on ‘Schooling and unequal outcomes in youth and adulthood’. We are grateful to two anonymous reviewers for their comments.

Bibliography

Agresti, A. (2002) Logit Models for Multinomial Responses. Chapter 7 *Categorical data analysis* (New York, John Wiley & Sons).

Blanden, J., Goodman, A., Gregg, P. & Machin, S. (2004) Changes in Intergenerational Mobility in Britain, in: M. Corak (Ed) *Generational Income Mobility in North America and Europe* (Cambridge, Cambridge University Press).

Blanden, J., Gregg, P. & Machin, S. (2005) *Intergenerational Moblity in Europe and North America: A report supported by the Sutton Trust* (London School of Economics, Centre for Economic Performance).

Boliver, V. (2013) How fair is access to more prestigious UK universities?, *The British journal of sociology*, 64(2), 344-364.

Boliver, V. & Swift, A. (2011) Do comprehensive schools reduce social mobility, *British Journal of Sociology*, 62(1), 89-110.

Boudon, R. (1974) *Education, opportunity, and social inequality : changing prospects in Western society* (New York, Wiley).

Bourdieu, P. & Passeron, J. C. ([1977] 1990) *Reproduction in education, society and culture* (London ; Beverly Hills, Sage Publications).

Brimer, M. A. & Dunn, L. M. (1962) *English Picture Vocabulary Test*Educational Evaluation Enterprises).

Burgess, S., Dickson, M. & Macmillan, L. (2014) Selective schooling systems increase inequality, *Department of Quantitative Social Science*, Working Paper no. 14-19.

Butler, B., Despotidou, S. & Shepherd, P. (1980) *1970 British Cohort Study (BCS70): Ten Year Follow-up* (London, Social Statistics Research Unit, City University).

Cameron, S. V. & Heckman, J. J. (1998) Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of American Males, The Journal of Political Economy), 262-333.

Chan, T. W. & Goldthorpe, J. H. (2007) Social Status and Newspaper Readership1, *American Journal of Sociology*, 112(4), 1095-1134.

Clark, D. & Del Bono, E. (2014) The long-run effects of attending an elite school: evidence from the UK, (Essex, ISER Working Paper Series).

Clifford, P. & Heath, A. (1984) Selection does make a Difference, *Oxford Review of Education*, 10, 85-97.

Closs, S. J. & Hutchings, M. J. (1976) *APU arithmetic test* (London, Hodder and Stoughton).

Cox, C. & Marks, J. (1980) *Real Concern: An Appraisal of the National Children's Bureau Report on Progress in Secondary Schools* (London, Centre for Policy Studies).

Croizet, J.-C. & Claire, T. (1998) Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds, *Personality and Social Psychology Bulletin*, 24(6), 588-594.

Crook, C. J. (1997) *Cultural Practices and Socioeconomic Attainment: The Australian Experience* (Westport, Connecticut, Greenwood Press).

De Graaf, N. D., De Graaf, P. M. & Kraaykamp, G. (2000) Parental Cultural Capital and Educational Attainment in the Netherlands: A Refinement of the Cultural Capital Perspective, *Sociology of Education*, 73, 92-111.

Dearden, L., Ferri, J. & Meghir, C. (2002) The Effect of School Quality on Educational Attainment and Wages, *Review of Economics and Statistics*, 84, 1-20.

Dodgeon, B. (2008) *Guide to the Dataset: BCS70 16 year follow up: APU arithmetic test* (London, Centre for Longitudinal Studies).

Elliott, C. D., Murray, D. J. & Pearson, L. S. (1979) *British Ability Scales* (Slough, NFER).

Elliott, J. & Shepherd, P. (2006) Cohort Profile: 1970 British birth cohort (BCS70), *International Journal of Epidemiology*, 35(4), 836-843.

Farkas, G. (2003) Cognitive Skills and Noncognitive Traits and Behaviours in Stratification Processes, *Annual Review of Sociology*, 29, 541-562.

Feinstein, L. (2003) Inequality in the Early Cognitive Development of British Children in the 1970 Cohort, *Economica*, 70(1), 73-97.

Feinstein, L. (2004) Mobility in pupils' cognitive attainment during school life, *Oxford Review of Economic Policy*, 20(2), 213-229.

Feinstein, L. & Symons, J. (1999) Attainment in secondary school, *Oxford Economic Papers*, 51, 300-321.

Ganzeboom, H. (1982) Explaining Differential Participation in High-Cultural Activities - A Confrontation of Information-Processing and Status-Seeking Theories, in: W. Raub (Ed) *Theoretical Models and Empirical Analyses: Contributions to the Explanation of Individual Actions and Collective Phenomena* (Utrecht, E.S. Publications), 186-205.

Gillard, D. (2011) *Education in England: a brief history* [www.educationengland.org.uk/history](http://www.educationengland.org.uk/history) ).

Gipps, C. & Murphy, P. (1994) *A fair test? : assessment, achievement and equity* (Milton Keynes, Open University Press).

Godfrey Thompson Unit (1978) *Edinburgh Reading Test* (Sevenoaks, Hodder and Stoughton).

Golding, J. (1975) *The 1970 Birth Cohort 5-Year Follow-up: Guide to the dataset* (University of Bristol, Institute of Child Health).

Goldthorpe, J. & Jackson, M. (2007) Intergenerational class mobility in contemporary Britain: political concerns and empirical findngs, *British Journal of Sociology*, 58(4), 525-546.

Goldthorpe, J. & Mills, C. (2008) Trends in Intergenerational Class Mobility in Modern Britain: Evidence from the National Surveys, 1972-2005, *National Institute Economic Review*, 205, 83-100.

Goldthorpe, J. H. (1997) The 'Goldthorpe' class schema: some observations on conceptual and operational issues in relation to the ESRC review of government social classifications, in: D. Rose & K. O'Reilly (Eds) *Constructing Classes: Towards a New Social Classification for the UK* (Swindon, ESRC/ONS).

Goodenough, F. L. (1926) *The measurement of intelligence by drawings* (New York, World Book Company).

Gorard, S. (2008) A re-consideration of rates of 'social mobility' in Britain: or why research impact is not always a good thing, *British Journal of Sociology of Education*, 29(3), 317-324.

Green, F., Machin, S., Murphy, R. & Zhu, Y. (2011) The changing economic advantage from private schools, *Economica*, xx, 1-22.

Halsey, A. H., Heath, A. & Ridge, J. (1980) *Origins and Destinations: family, class, and education in modern Britain* (Oxford, OUP).

Harris, D. B. (1963) *Children's drawings as measures of intellectual maturity* (New York, Harcourt, Brace and World).

Hawkes, D. & Joshi, H. Age at motherhood and child development: Evidence from the UK Millennium Cohort, *National Institute Economic Review*, 222(1), R52-R66.

Hawkes, D. & Joshi, H. (2012) Age at motherhood and child development: Evidence from the UK Millennium Cohort, *National Institute Economic Review*, 222(1), R52-R66.

Heath, A. & Jacobs, S. (1999) Comprehensive Reform in Britain, in: A. Leschinsky & K. U. Mayer (Eds) *The Comprehensive School Experiment Revisited: Evidence from Western Europe* (Frankfurt-am-Main, Peter Lang).

Hefce (2014) Differences in degree outcomes: Key findings, *Hefce discussion paper 2014/03*.

Hill, V. (2005) Through the past darkly: A review of the British Ability Scales Second

Edition, *Child and Adolescent Mental Health*, 10, 87-98.

Jackson, M. (2013) Social Background and Educational Transitions in England, in: M. Jackson (Ed) *Determined to succeed: Performance versus choice in educational attainment* (Stanford, Stanford University Press).

Jerrim, J. & Vignoles, V. (2013) Social mobility, regression to the mean and the cognitive development of high ability children from disadvantaged homes, *Journal of the Royal Statistical Society (Series A)*, 176(4), 887-906.

Karlson, K. B. (2013) Summarizing primary and secondary effects, *Research in social stratification and mobility*, 33, 72-82.

Kerckhoff, A. C., Fogelman, K. R., Crook, D. & Reeder, D. (1996) *Going Comprehensive in England and Wales: A study of Uneven Change* (London, Woburn Press).

Kerckhoff, A. C. & Trott, J. (1983) Educational Attainment in a changing Educational System: the Case of England and Wales, in: Y. Shavit & H.-P. Blossfeld (Eds) *Changing Educational Attainment in Thirteen Countries* (Boulder, CO, Westview).

Kiernan, K. & Mensah, F. K. (2011) Poverty, Family Resources and Children's Educational Attainment: The Mediating Role of Parenting, *British Educational Research Journal*, 37(2), 317-336.

Lareau, A. & Weininger, E. B. (2003) Cultural capital in education research: A critical assessment, *Theory and Society*, 32, 567-606.

Little, R. J. A. & Rubin, D. B. (1987) Statistical analysis with incomplete data, (New York, Wiley).

Lucas, S. R. (2001) Effectively Maintained Inequality: Education, Transitions, Track Mobility, and Social Background Effects, *American Journal of Sociology*, 106, 1642-1690.

Marks, G. N. (2005) Cross-national differences and accounting for social class inequalities in education, *International sociology*, 20(4), 483-505.

Marks, J., Cox, C. & Pomian-Srednicki, M. (1983) *Standards in English Schools* (London, National Council for Educational Standards).

Mostafa, T. & Wiggins, D. (2014) Handling attrition and non-response in the 1970 British Cohort Study, *CLS Working Paper*, 2014/2.

Nisbet, J. (1953) Family Environment and Intelligence, *Eugenics Review*, XLV, 31-42.

O' Leary, J. & Cannon, T. (1993) *Times Good Universities Guide* (London, Times Books).

Parsons, S. (2014 in press) Childhood cognition in the 1970 British Cohort Study *CLS Working Papers*.

Power, C., Manor, O. & Fox, J. (1991) *Health and class: the early years*Chapman & Hall).

Robson, K. & Pevalin, D. J. (2007) Gender differences in the predictors and socio-economic outcomes of young parenthood in Great Britain, *Research in social stratification and mobility*, 25(3), 205-218.

Rutter, M., Tizard, J. & Whitmore, K. (1970) *Education, Health and Behaviour* (London, Longmans).

Schafer, J. L. (1997) *Analysis of incomplete multivariate data* (Florida, Chapman and Hall/CRC press).

Smith, J. & Naylor, R. (2001) Determinants of degree performance in UK universities: a statistical analysis of the 1993 cohort, *Oxford Bulletin of Economics and Statistics*, 63(1), 29-60.

Spencer, S. J., Steele, C. M. & Quinn, D. M. (1999) Stereotype threat and women's math performance, *Journal of experimental social psychology*, 35(1), 4-28.

Steedman, J. (1980) *Progress in Secondary Schools* (London, National Children's Bureau).

Steedman, J. (1983a) *Examination Results in Selective and Non-Selective Schools* (London, National Children's Bureau).

Steedman, J. (1983b) *Examination Results in Selective and Non-selective Schools, Volume 2 - Appendices* (London, National Children's Bureau).

Sullivan, A. (2001) Cultural Capital and Educational Attainment, *Sociology*, 35(4), 893-912.

Sullivan, A. (2002) Bourdieu and Education: How Useful is Bourdieu's Theory for Researchers?, *Netherlands' Journal of Social Sciences*, 38(2), 144-166.

Sullivan, A. (2006) Students as rational decision-makers: the question of beliefs and attitudes, *London Review of Education*, 4(3), 271-290.

Sullivan, A. (2007) Cultural Capital, Cultural Knowledge, and Ability, *Sociological Research Online*, 12(6).

Sullivan, A. & Heath, A. (2003) Intakes and Examination Results at State and Private Schools, in: G. Walford (Ed) *British Private Schools: research on policy and practice* (London, Woburn Press), 77-104.

Sullivan, A., Ketende, S. & Joshi, H. (2013) Social class and inequalities in early cognitive scores, *Sociology*, 47(6), 1187-1206.

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I. & Taggart, B. (2004) *The effective provision of pre-school education (EPPE) Project: Findings from the pre-school to the end of Key Stage 1* (London, DfES).

Waters, M. C., Heath, A. F., Tran, V. C. & Boliver, V. (2014) Second-Generation Attainment and Inequality:

Primary and Secondary Effects on Educational Outcomes in Britain and the U.S. , in: R. Alba & J. Holdaway (Eds) *The children of immigrants at school: a comparative look at integration in the United States and Western Europe* (New York, New York University Press).

Zimdars, A., Sullivan, A. & Heath, A. F. (2009) Elite higher education admissions in the arts and sciences: Is cultural capital the key?, *Sociology*, 43(4), 648-666.

**Table 1: descriptive statistics by type of secondary school attended**

|  | **Comp** | **SecMod** | **Gram** | **Private** | **Special** | **All** | ***Original N*** | ***% missing*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **% attending type school** | **80.1** | **8.7** | **4.2** | **6.0** | **1.0** | **100** | ***7767*** | ***0*** |
| Sex: % female | 52.4 | 53.4 | 53.2 | 49.6 | 37.2 | **52.2** | ***7767*** | ***0*** |
| Birthweight: grams  (range: 737-6463) | 3312 | 3278 | 3361 | 3383 | 3172 | **3314** | ***7767*** | ***0*** |
| Mean age mother 1stbirth  (range: 13-46 years) | 23.1 | 22.6 | 24.3 | 25.2 | 22.4 | **23.2** | ***7767*** | ***0*** |
| Mean birth order  (range: 1-13) | 2.0 | 2.2 | 1.9 | 1.9 | 2.2 | **2.0** | ***7767*** | ***0*** |
| **Cult-Edu resources** |  |  |  |  |  |  |  |  |
| *Highest parent qual (5)*  % no quals | 36.2 | 41.5 | 20.7 | 6.5 | 50.3 | **34.3** | ***6822*** | ***12.2*** |
| % Vocational | 16.4 | 20.1 | 11.4 | 7.2 | 17.6 | **16.0** |  |  |
| % O Levels | 23.2 | 21.5 | 23.5 | 18.8 | 12.6 | **22.7** |  |  |
| % A Levels | 10.1 | 8.8 | 13.7 | 15.3 | 8.7 | **10.4** |  |  |
| % Degree or higher | 14.1 | 8.0 | 30.7 | 52.1 | 10.6 | **16.5** |  |  |
| *Newspapers at home (16):* % none | 23.9 | 20.8 | 15.3 | 26.6 | 34.6 | **22.2** | ***2580*** | ***66.8*** |
| % Tabloid | 59.5 | 62.0 | 52.0 | 22.2 | 47.4 | **56.9** |  |  |
| % Broadsheet | 8.0 | 5.8 | 19.9 | 34.0 | 11.5 | **12.4** |  |  |
| % both | 8.6 | 11.4 | 12.8 | 17.1 | 6.4 | **8.4** |  |  |
| *Mean days parent reads to child per week (range: 0-7)* | 4.4 | 4.0 | 5.2 | 5.6 | 4.1 | **4.4** | ***6661*** | ***14.2*** |
| **Economic Resources** |  |  |  |  |  |  |  |  |
| *Social class (birth):*  *%*  IV/V) | 16.4 | 17.7 | 11.3 | 5.6 | 20.5 | **15.7** | ***7767*** | ***0*** |
| % IIIm | 31.6 | 37.1 | 20.5 | 9.4 | 44.9 | **30.4** |  |  |
| % IIInm | 31.1 | 29.3 | 30.0 | 23.6 | 24.4 | **30.4** |  |  |
| % II or I | 20.9 | 15.9 | 38.2 | 61.4 | 10.3 | **23.5** |  |  |
| *Housing tenure (5):*  *% home owner* | 59.4 | 49.3 | 74.6 | 85.4 | 43.4 | **60.6** | ***6891*** | ***11.3*** |
| *Overcrowding (5) person-room ratio (range:-0.3-6.0)* | 0.88 | 0.91 | 0.79 | 0.67 | 1.04 | **0.86** | ***6823*** | ***12.2*** |
| **Mean cognitive (5)**  (range: -3.94 - 5.02) | -0.00 | -0.31 | 0.59 | 0.63 | -1.14 | **0.02** | ***6089*** | ***21.6*** |
| **Mean cognitive (10)**  (range: -4.11 – 3.25) | -0.04 | -0.34 | 0.77 | 0.87 | -1.25 | **0.01** | ***6130*** | ***21.1*** |
| **Mean cognitive (16)**  (range: -5.00 – 2.45) | -0.02 | -0.30 | 0.69 | 0.70 | -1.43 | **0.01** | ***1582*** | ***79.6*** |
| **Mean exam score (public examinations age 16)**  (range: -1.24-4.61) | 0.00 | -0.30 | 0.69 | 0.74 | -0.71 | **0.04** | ***3289*** | ***57.7*** |
| **English: % A-C/grade 1 (16)** | 39.3 | 27.6 | 74.7 | 79.7 | 12.2 | **41.9** | ***7211*** | ***7.2*** |
| **Maths: % A-C/grade 1 (16)** | 32.5 | 20.3 | 66.6 | 71.1 | 13.1 | **35.0** | ***7217*** | ***7.1*** |
| **A levels (by age 20)**  % none | 85.1 | 92.4 | 58.1 | 47.8 | 91.0 | **82.4** | ***7767*** | ***0*** |
| D-E Grade | 3.2 | 2.1 | 6.1 | 5.8 | 0 | **3.4** |  |  |
| 1-2 A-C Grade | 7.2 | 3.6 | 18.9 | 17.6 | 5.1 | **8.0** |  |  |
| 3+ A-C Grade | 4.4 | 1.9 | 16.8 | 28.9 | 3.8 | **6.2** |  |  |
| **% Degree (42)** | 14.9 | 9.2 | 27.5 | 31.2 | 8.9 | **15.8** | ***7767*** | ***0*** |
| **% Elite degree (42)** | 5.0 | 2.4 | 12.8 | 31.5 | 2.6 | **6.7** | ***7767*** | ***0*** |

Imputed means, original n

Table 2: Correlation coefficients between cognitive and attainment scores

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cognitive 5 | Cognitive 10 | Cognitive 16 | Exam score 16 | Maths A-C | English A-C | A Levels | Elite/Degree |
| Cognitive 5 | 1 |  |  |  |  |  |  |  |
| Cognitive 10 | .56 (.01) | 1 |  |  |  |  |  |  |
| Cognitive 16 | .46 (.02) | .68 (.02) | 1 |  |  |  |  |  |
| Exam score 16 | .35 (.01) | .51 (.01) | .51 (.01) | 1 |  |  |  |  |
| Maths A-C | .31 (.02) | .46 (.02) | .47 (.03) | .60 (.02) | 1 |  |  |  |
| English A-C | .32 (.02) | .47 (.02) | .48 (.03) | .62 (.02) | .61 (.01) | 1 |  |  |
| A Levels | .28 (.01) | .41 (.01) | .37 (.01) | .45 (.01) | .45 (.01) | .42 (.01) | 1 |  |
| Elite/Degree | .29 (.02) | .41 (.02) | .37 (.02) | .41 (.02) | .41 (.01) | .39 (.01) | .59 (.01) | 1 |

Imputed data, N=7767

Table 3: Multinomial logistic regression results (n=7767)

|  | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | | **Model 5** | | **Model 6** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Deg | *E*Deg | Deg | *E*Deg | Deg | *E*Deg | Deg | *E*Deg | Deg | *E*Deg | Deg | *E*Deg |
| Sex | 1.11 | 0.99 | 1.10 | 0.96 | 1.16\* | 1.07 | 1.16\* | 1.08 | 1.02 | 0.94 | 0.96 | 0.88 |
| Birthweight | 1.00^ | 1.00^ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Age mother first birth | 1.05\*\*\* | 1.06\*\*\* | 1.04\*\*\* | 1.06\*\*\* | 1.03\*\*\* | 1.05\*\* | 1.03\*\* | 1.05\*\* | 1.02\* | 1.03\* | 1.02^ | 1.02 |
| Birth order | 0.95 | 0.95 | 0.96 | 0.97 | 0.98 | 0.98 | 0.97 | 0.94 | 1.00 | 1.00 | 0.99 | 0.97 |
| **Cult-Edu Resources** |  |  |  |  |  |  |  |  |  |  |  |  |
| *Highest qual* (ref: no quals) |  |  |  |  |  |  |  |  |  |  |  |  |
| Vocational | 1.31\* | 1.65\* | 1.24 | 1.55^ | 1.22 | 1.54^ | 1.22 | 1.49^ | 1.15 | 1.39 | 1.16 | 1.45 |
| O Levels | 1.81\*\*\* | 2.26\*\*\* | 1.67\*\*\* | 2.05\*\*\* | 1.45\*\* | 1.66\* | 1.45\*\* | 1.59\* | 1.31\* | 1.41 | 1.24^ | 1.33 |
| A Levels | 2.01\*\*\* | 3.05\*\*\* | 1.80\*\*\* | 2.68\*\*\* | 1.55\*\* | 2.14\*\* | 1.53\*\* | 1.99\*\* | 1.34\* | 1.68\* | 1.23 | 1.56^ |
| Degree or higher | 3.02\*\*\* | 5.54\*\*\* | 2.61\*\*\* | 4.52\*\*\* | 2.13\*\*\* | 3.37\*\*\* | 2.05\*\*\* | 3.00\*\*\* | 1.74\*\*\* | 2.46\*\*\* | 1.56\*\* | 2.13\*\* |
| *Newspapers* (ref cat: none) |  |  |  |  |  |  |  |  |  |  |  |  |
| Tabloid | 0.71\* | 0.54\*\*\* | 0.70\*\* | 0.53\*\*\* | 0.72\* | 0.56\*\*\* | 0.73\* | 0.58\*\* | 0.76\* | 0.62\*\* | 0.75\* | 0.60\*\* |
| Broadsheet | 1.46\* | 1.79\*\*\* | 1.44\* | 1.75\*\* | 1.37^ | 1.60\* | 1.33 | 1.49\* | 1.29 | 1.41^ | 1.22 | 1.27 |
| Both | 1.03 | 0.69 | 1.01 | 0.67^ | 1.00 | 0.66^ | 0.98 | 0.62^ | 1.05 | 0.68 | 1.00 | 0.63 |
| *No. times reads to child* | 1.06\*\*\* | 1.11\*\*\* | 1.04\* | 1.09\*\* | 1.02 | 1.05^ | 1.02 | 1.05^ | 1.01 | 1.03 | 1.01 | 1.03 |
| **Economic Resources** |  |  |  |  |  |  |  |  |  |  |  |  |
| *Social class* (ref cat: IV/V) |  |  |  |  |  |  |  |  |  |  |  |  |
| IIIm | 0.80^ | 0.75 | 0.79^ | 0.76 | 0.81 | 0.82 | 0.83 | 0.85 | 0.85 | 0.91 | 0.82 | 0.88 |
| IIInm | 0.92 | 1.35 | 0.87 | 1.28 | 0.80^ | 1.16 | 0.81^ | 1.18 | 0.75\* | 1.12 | 0.72\* | 1.06 |
| II or I | 1.19 | 1.59\* | 1.11 | 1.45 | 0.98 | 1.22 | 0.96 | 1.18 | 0.91 | 1.13 | 0.83 | 1.02 |
| *Home owner* (ref cat: no) |  |  |  |  |  |  |  |  |  |  |  |  |
| Yes | 1.65\*\*\* | 1.51\*\* | 1.57\*\*\* | 1.44\* | 1.49\*\*\* | 1.35^ | 1.48\*\*\* | 1.37\* | 1.43\*\*\* | 1.30 | 1.44\*\*\* | 1.29 |
| *Overcrowding* | 0.76^ | 0.31\*\*\* | 0.88 | 0.37\*\* | 0.94 | 0.43\*\* | 1.00 | 0.60 | 1.03 | 0.63 | 1.10 | 0.68 |
| **Cognitive (5)** |  |  | 1.60\*\*\* | 1.93\*\*\* | 1.19\*\*\* | 1.26\*\* | 1.19\*\*\* | 1.25\*\* | 1.12\* | 1.18\* | 1.12\* | 1.15^ |
| **Cognitive (10)** |  |  |  |  | 2.18\*\*\* | 3.39\*\*\* | 2.14\*\*\* | 3.21\*\*\* | 1.38\*\*\* | 1.92\*\*\* | 1.27\*\* | 1.53\*\* |
| **School type** (ref cat: Comprehensive) |  |  |  |  |  |  |  |  |  |  |  |  |
| Secondary Modern |  |  |  |  |  |  | 0.83 | 0.83 | 0.92 | 0.96 | 0.93 | 0.94 |
| Grammar |  |  |  |  |  |  | 1.12 | 1.11 | 0.89 | 0.87 | 0.75^ | 0.67^ |
| Private |  |  |  |  |  |  | 1.70\*\*\* | 3.36\*\*\* | 1.52\*\* | 3.04\*\*\* | 1.37\* | 2.48\*\*\* |
| Special Needs |  |  |  |  |  |  | 1.18 | 0.90 | 1.58 | 1.20 | 1.30 | 0.75 |
| **Cognitive (16)** |  |  |  |  |  |  |  |  | 1.36\*\* | 1.32^ | 1.33\*\* | 1.27 |
| **Exam performance (16)** |  |  |  |  |  |  |  |  |  |  |  |  |
| Exam score |  |  |  |  |  |  |  |  | 1.20\*\* | 1.46\*\*\* | 1.10^ | 1.27\*\* |
| English 0 Level A-C/CSE 1 |  |  |  |  |  |  |  |  | 1.79\*\*\* | 1.49\* | 1.54\*\*\* | 1.33 |
| Maths 0 Level A-C/CSE 1 |  |  |  |  |  |  |  |  | 1.78\*\*\* | 2.56\*\*\* | 1.40\*\* | 1.73\*\* |
| **Exam performance (18)**  (ref cat: no A’levels) |  |  |  |  |  |  |  |  |  |  |  |  |
| D-E Grade |  |  |  |  |  |  |  |  |  |  | 3.73\*\*\* | 1.57 |
| 1 or 2 A-C Grade |  |  |  |  |  |  |  |  |  |  | 5.51\*\*\* | 4.21\*\*\* |
| 3+ A-C grade |  |  |  |  |  |  |  |  |  |  | 10.86\*\*\* | 32.51\*\*\* |
| *Pseudo R2*  *R2 range* | *.13*  *.128-.137* | | *.16*  *.152-.162* | | *.20*  *.195-.206* | | *.21*  *.204-.210* | | *.25*  *.248-.258* | | *.31*  *.311-.319* | |
| *N* | *7767* | | *7767* | | *7767* | | *7767* | | *7767* | | *7767* | |

Note: \*\*\*p<.001 \*\*p<.01 \*p<.05 ^p<.1

Endnotes

1. The tripartite system was so called because it included three types of secondary school: grammar, secondary modern and technical. However, the technical schools, which were intended for children with technical or scientific aptitude, never really took off. Around 20% of state school children gained grammar places, and the great majority were relegated to secondary moderns (see Gillard, D. (2011) *Education in England: a brief history* www.educationengland.org.uk/history ). [↑](#endnote-ref-1)
2. [↑](#endnote-ref-2)
3. The Russell Group was established in 1994. Its current members are the universities of: Birmingham, Bristol, Cambridge, Cardiff, Durham, Edinburgh, Exeter, Glasgow, Imperial College London, King’s College London, Leeds, Liverpool, LSE, Manchester, Newcastle, Nottingham, Oxford, Queen Mary University of London, Queen’s Belfast, Sheffield, Southampton, University College London, Warwick, York. [↑](#endnote-ref-3)
4. We also consulted data on university points entry from 1989-90 and 2011, and included two additional universities that have consistently featured in the top 30 most selective institutions: University of Bath and St Andrews. [↑](#endnote-ref-4)
5. The Times Good Universities Guide (1993) comments of Durham University that ‘Chemistry (CCD), geography (BBC), music and physics (both BCC) are among the top departments. Only Oxford and Cambridge have higher entry standards.’ (p.110). [↑](#endnote-ref-5)