



**Social Mobility &
Child Poverty
Commission**

Progress made by high-attaining children from disadvantaged backgrounds

Research report

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Centre for Analysis of Youth Transitions (CAYT)

The Centre for Analysis of Youth Transitions (CAYT) is one of three Research Centres established by the Department of Education in January 2010 to provide independent research, analysis and advice to the Department.

CAYT is a consortium of three partner organisations, each bringing different expertise to the centre: educationalists and social scientists from the Institute of Education (IoE), economists from the Institute for Fiscal Studies (IFS) and social researchers at the National Centre for Social Research (NatCen).

The centre was established to improve understanding of the national and international evidence on young people's attainment, transitions and behaviour (aged 13 to 19+) – including work on the value of qualifications, subject choice, participation in learning, social mobility, teaching impacts on pupil outcomes, youth labour market analysis and evidence on youth behaviour.

Prepared for:

Social Mobility and Child Poverty Commission (SMCP)

The Social Mobility and Child Poverty Commission is an advisory non-departmental public body (NDPB) of the Department for Education, the Department for Work & Pensions and the Cabinet Office.

The Commission was established with a remit to:

- publish an annual report setting out progress made in improving social mobility and reducing child poverty in Great Britain;
- provide published advice to ministers at their request on social mobility and child poverty; and
- act as an advocate for social mobility beyond government by challenging employers, the professions and universities amongst others to play their part in improving life chances.

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Executive summary

Education is a key driver of social mobility and reducing educational inequality is central to this goal. In this report, we track the performance of high-achieving pupils from poor backgrounds through the education system and compare their trajectories with those of their more advantaged peers. Specifically, we consider the trajectories of poor children who make it to high-status (or ‘elite’) universities (defined as Russell Group institutions or other institutions with similarly high Research Assessment Exercise scores). We also consider the later attainment of poor children who have initially high, average and low attainment at age 7.

We are mindful of the methodological challenge of identifying the trajectories of particular groups of higher-achieving pupils whilst accounting for the statistical problem of regression to the mean (RTM). RTM occurs when initially high-achieving pupils look as if they are falling behind over time simply because their initial test scores were a poor representation of their true ability as they happened to be ‘lucky’ on the day of the test. This work aims to build on previous studies that have tried to address this issue, taking into account potential measurement issues to understand how initially high-achieving children from less advantaged backgrounds progress in the education system and to determine at what point they appear to fall back relative to their more advantaged peers.

We use data on a cohort of children born in 1991–92. The data we use are the linked National Pupil Database (NPD) – Individual Learner Records (ILR) – Higher Education Statistics Agency (HESA) data. These data enable us to follow children through primary and secondary school, from Key Stage 1 to Key Stage 4, as well as observing their participation and performance at Key Stage 5, and whether they went to university at age 18 or 19, including which university they attended.

Our measures of the socio-economic background of the child are school type, the child’s free school meal (FSM) status during secondary school and an index of socio-economic status (SES) that combines FSM eligibility with a variety of measures of the deprivation of their neighbourhood. We examine differences in attainment on the basis of each of these measures of SES separately.

Our sample includes all children who attended a state primary school and sat Key Stage 1 and 2 tests, including students who went on to study at a private secondary school.

Defining those who are ‘high achieving’ is a key part of our analysis. We use a series of measures at each Key Stage to indicate high achievement. A minority of students are defined as high achieving using our definitions. For example:

- Just under 10% of our sample attend an ‘elite’ university.
- At Key Stage 5, 11% of our sample have at least three A or B grades at A level.
- At Key Stage 4, 37% of our sample achieved five or more A*–C grades in EBacc GCSE subjects.

- At Key Stages 1 and 2, around 18–19% achieve above the expected level in both English/reading and maths (the expected level is level 2 at Key Stage 1 and level 4 at Key Stage 2).

Findings

Students from poorer backgrounds are far less likely to achieve these high levels of attainment. For example:

- Only 8.9% of the most deprived children reach level 3 in both reading and maths at Key Stage 1, compared with 27% of the least deprived children.
- At Key Stage 2, 7.1% of those who always claim FSM attain level 5 in English and maths, compared with 19% of those who do not always claim FSM.
- At Key Stage 4, 92% of selective state school children have at least five good GCSEs in EBacc subjects, compared with 33% of non-selective state school students.

In addition, children from poorer backgrounds who are high attaining at age 7 are more likely to fall off a high attainment trajectory than children from richer backgrounds. We find that high-achieving children from the most deprived families perform worse than lower-achieving students from the least deprived families by Key Stage 4. Conversely, lower-achieving affluent children catch up with higher-achieving deprived children between Key Stage 2 and Key Stage 4.

This suggests that early success at Key Stages 1 and 2 is a much better predictor of later success for richer students. It also suggests that there are substantial numbers of children from poorer backgrounds falling behind. This is reflected particularly by the very small numbers of children from deprived families who attend elite institutions. For example, of those born in 1991–92, only 921 pupils, or 2.8%, who always claimed FSM throughout secondary school went to an elite university (out of 33,039 children who always claimed FSM), compared with 40,165 pupils, or 9.9%, who never claimed FSM throughout secondary school (out of 406,596 children).

This highlights the large differences in the likelihood of going to an elite institution between children from richer and poorer backgrounds. These gaps are particularly large for state school students from the most compared with the least deprived families and those from private secondary schools compared with non-selective state secondary schools. However, these differences can largely be explained by the higher levels of achievement of pupils from more affluent backgrounds.

For example, accounting for a rich set of measures of attainment at either Key Stage 4 or Key Stage 5 enables us to explain a substantial proportion of the difference in participation rates, and accounting for other background characteristics and prior attainment at every Key Stage reduces this gap even further. The difference between pupils who were ever or always eligible for free school meals compared with those who were not becomes small and is no longer statistically significant, but there remain small but significant gaps between the most and least deprived state school students and between those from private schools and those from non-selective state schools. For example, we find that young people from the least deprived backgrounds are 5.9

percentage points more likely to attend a high-status university than those from the most deprived backgrounds, even after accounting for a rich set of controls. Similarly, those attending private secondary schools are 4.3 percentage points more likely to attend a high-status institution than those who attend non-selective state secondary schools (although this difference can largely be eliminated by the inclusion of controls for individual measures of SES in addition to school type). Further research could usefully explore the drivers of these small remaining gaps.

Interestingly, students from poorer backgrounds who do make it into an elite university tend to have lower academic achievement than their more advantaged peers in elite institutions. For example, of those who enrol in an elite university, 47% of the most deprived children achieve at least three A or B grades at A level, compared with 73% of the least deprived children.

There are a number of possible explanations for this. First, it may be that poorer students tend to attend somewhat less elite universities within the group of high-status institutions that we consider. We found some evidence to support this: the difference in grades between students from richer and poorer backgrounds within a narrower set of elite institutions was smaller, but significant differences remained, especially between state school students from the most and least deprived backgrounds. Second, it could be that this result is being driven by students from less deprived families exceeding their grade offers to a greater extent than deprived students. Third, it is possible that some elite universities may be using contextualised admissions processes and accounting for the circumstances of children when making entry offers. Further research could usefully explore the potential role of contextual admissions policies in reducing the socio-economic gap in participation at high-status institutions.

Although the socio-economic differences in the likelihood of attending an elite institution are relatively small once we account for prior attainment, many fewer children from poorer backgrounds are achieving – and importantly maintaining – these high levels of achievement. For example, of the 7,853 children from the most deprived homes who achieve level 5 in English and maths at age 11, only 906 make it to an elite university. If they had the same trajectory as a child from one of the least deprived families, then 3,066 of these children would be likely to go to an elite university, suggesting that 2,160 children are falling behind.

Policy implications

The period between Key Stage 2 and Key Stage 4 appears to be a crucial time to ensure that higher-achieving pupils from poor backgrounds remain on a high achievement trajectory. Given the importance of attainment at the end of secondary school in explaining higher education participation decisions, this highlights the potential importance of secondary school as a period of intervention for policymakers interested in increasing participation at high-status universities amongst young people from more deprived backgrounds.

While children from the most deprived families are less likely to attend an elite university, those who do attend have lower prior attainment, on average, than their more affluent counterparts. One possible explanation for this is that children from more deprived backgrounds are less likely to apply to elite institutions. It is therefore important that universities and policymakers provide

students from poorer backgrounds with advice to encourage greater numbers of applications to elite institutions, as those with the top grades stand a good chance of getting in if they do apply.

Introduction

Education is a key driver of social mobility and reducing educational inequality is central to this goal. While the evidence base regarding levels of educational inequality in the UK has been increasing in recent years,¹ much of this evidence has been cross-sectional, focusing on attainment gaps at different levels of education for different cohorts. Less attention has been paid to differences in the patterns of educational attainment over time by family background – for example, examining whether those who start as relatively high or low performers maintain this level throughout their education and whether the propensity to do so varies by family background.

Feinstein (2003) found that high-achieving children from low-income families were at risk of falling behind low-achieving children from high-income families before they started school, although Jerrim and Vignoles (2013) demonstrated that measurement issues could be driving this finding. Goodman and Gregg (2010) also illustrated how attainment gaps increased as children got older, by piecing together information from a number of UK cohort studies to provide a picture of attainment trajectories by family background from age 3 to age 16. This work aims to build on these previous studies, taking advantage of new linked administrative data – and accounting for potential measurement issues – to understand how initially high-achieving children from less advantaged backgrounds progress in the education system and to determine at what point they appear to fall behind relative to their more advantaged peers.

Research questions

We investigate the attainment of children from different backgrounds in two ways: looking backwards and looking forwards. First, we look back at the attainment trajectories of children who make it to high-status universities at age 18/19. Second, we look forward, to consider the subsequent attainment of children with initially high, average and low attainment at age 7.

We address the following research questions:

1. Do those who make it to high-status universities at age 18/19 have consistently high attainment throughout school?
2. Do those who perform well at age 7 continue to have high attainment throughout school?
3. Do these trajectories vary by family background?

Data and methodological challenges

To analyse these research questions, we focus on a cohort of children born in 1991–92 and follow them throughout their education using the linked National Pupil Database (NPD) – Individual Learner Record (ILR) – Higher Education Statistics Agency (HESA) data. The NPD data provide a census of children attending state schools in England, together with Key Stage test scores for all children who sat them (including those in private schools). The ILR data additionally enable us to observe participation in post-compulsory education, together with attainment measures for those who stayed on. The linked HESA data allow us to observe which young people went to university

¹ For example, Crawford (2012) and Blanden and Macmillan (2014).

in the UK and which university they attended if they participated. For this cohort, we are able to observe whether they participated for the first time at age 18 or 19 (in HESA data from 2010–11 or 2011–12). The linked NPD–ILR–HESA data therefore potentially enable us to follow children from Key Stage 1 right through to participation in higher education.

While the NPD–ILR–HESA data are somewhat limited in terms of background characteristics, we are able to observe the type of secondary school that the child attended (state or private) and, for those educated in state secondary schools, the child’s free school meal (FSM) status and a set of local area information linked in on the basis of home postcode at age 16, such as the Index of Multiple Deprivation (IMD) score.

We define our sample as all individuals for whom Key Stage (KS) 1, 2 and 4 information is available. Our sample of privately educated children is therefore a subgroup of the overall population of privately educated children – namely, those who attended a state primary school (around 60% of those at private secondary schools went to a state primary school). We additionally exclude individuals who attended a special secondary school and those who did not have relevant information on FSM eligibility throughout their time at secondary school if attending a state secondary school.

We therefore have a final sample of 520,984 children born in 1991–92 from a potential sample of 671,100. As can be seen from Figure 1, the largest attrition arises from the requirement that we observe Key Stage information at primary school. Figure 2 suggests that those in state secondary schools who are missing this information are typically less advantaged and perform less well at Key Stage 4 than those for whom we do observe this information. By contrast, those who are privately educated at secondary school for whom this information is missing (presumably in most cases because they were also privately educated at primary) perform slightly worse than our remaining privately educated sample who attended a state primary.

Figure 1 Sample composition

	State secondary	Private secondary	Total
Whole sample	623,629	47,471	671,100
No special schools	611,674	47,471	659,145
KS4 information	586,029	47,471	633,500
FSM information	557,826	n/a	605,297
Primary Key Stage information	500,632	20,352	520,984

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure 2 Key characteristics by school type at primary and secondary

	Ever FSM	Always FSM	KS4 points	N
State educated primary and secondary	18.8	6.6	43.4	500,632
State secondary – missing primary KS info	38.9	15.5	28.2	57,194
Private secondary, state primary	n/a	n/a	56.4	20,352
Private secondary – missing primary KS info	n/a	n/a	51.7	27,119

Note: ‘Ever FSM’ and ‘Always FSM’ are defined throughout secondary school (i.e. from Years 7 to 11). ‘KS4 points’ is coded using the old points score system, with eight points equivalent to an A*, seven to an A, and so on. Pupils missing primary school data either went to a private primary school, are new immigrants or were absent on the day of one of the KS1 or KS2 tests.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Measuring attainment

For the first stage of our analysis, in which we look back at the attainment trajectories of young people who make it to a high-status university to see whether they were high-achieving throughout their education, we have to define what is meant by high attainment at various education levels. Starting at university and working backwards, high attainment at university is defined as those attending a high-status institution at age 18/19. High-status institutions are defined as Russell Group institutions or institutions with an average score from the 2001 Research Assessment Exercise (RAE) that is higher than the lowest-ranked Russell Group institution. This captures a total of 41 research-intensive universities, which just under 10% of our sample attended at age 18/19 (Figure 3).²

At Key Stage 5, there is no broad consensus on what may be considered high attainment and so we consider a number of alternative definitions of high attainment, including:

- attaining three, two and one or more A–B grades in facilitating subjects at A level;
- attaining three, two and one or more A–B grades in any subject at A level;
- participating in Key Stage 5.

² These institutions are: Aston, Bath, Birkbeck College, Birmingham, Bristol, Cambridge, Cardiff, Courtauld Institute of Art, Durham, East Anglia, Edinburgh, Essex, Exeter, Glasgow, Homerton College, Imperial College London, King’s College London, Lancaster, Leeds, Liverpool, London School of Economics, Manchester, Newcastle, Nottingham, Oxford, Queen Mary and Westfield College, Queen’s University Belfast, Reading, Royal Holloway and Bedford New College, Royal Veterinary College, School of Oriental and African Studies, School of Pharmacy, Sheffield, Southampton, Surrey, Sussex, University of the Arts London, University College London, University of London, Warwick and York.

Figure 3 Descriptive statistics: high attainment and family background

	Frequency (%)
Studying for a degree at an elite university	9.7
3+ A–B in facilitating subjects at A level	3.2
2+ A–B in facilitating subjects at A level	7.0
1+ A–B in facilitating subjects at A level	13.2
3+ A–B in any subjects at A level	10.7
2+ A–B in any subjects at A level	16.5
1+ A–B in any subjects at A level	24.0
Percentage taking A levels	53.1
6+ A*–C in EBacc subjects at GCSE	21.9
5+ A*–C in EBacc subjects at GCSE	36.8
4+ A*–C in EBacc subjects at GCSE	49.4
Level 5+ at KS2 in English and maths	19.2
Level 5+ at KS2 in English or maths	41.7
Level 3+ at KS1 in reading and maths	18.3
Level 3+ at KS1 in reading or maths	36.4
Ever FSM	18.8
Always FSM	6.6
Bottom deprivation quintile (most deprived)	17.7
Top deprivation quintile (least deprived)	20.0
Selective secondary school	3.5
Private secondary school	3.9 ^a
N	520,984

^a Private school children who went to state primary schools, so that KS1 and KS2 test scores are observed.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Facilitating subjects are as defined in the official list of subjects favoured by top universities published by the Deputy Prime Minister's Office in its list of Social Mobility Indicators.³ These include English, maths, science, classical and modern languages, and humanities. As can be seen from Figure 3, just 3% of students acquire three A or B grades in facilitating subjects, while 13% achieve at least one A or B grade in these subjects. Given the relatively low proportion of pupils who achieve high grades in facilitating subjects, we additionally consider those who receive a number of A or B grades in any subjects at A level: just under 11% of our sample have at least three A levels at grades A or B and 24% have at least one A level at these grades. In our analysis, we focus on achieving three or more A or B grades in any subject as our main measure of high attainment, given that universities typically focus on three A-level grades. The results for all other measures considered are included in the appendix along with an even broader measure – namely, participation at Key Stage 5, which over 50% of our final sample achieve.⁴

There is also no consensus on what is considered high attainment at Key Stage 4. We therefore again consider a number of definitions, based on attaining different numbers of A*–C grades in EBacc subjects at GCSE. These EBacc subjects are the subjects that are used to form the English Baccalaureate, which are English, maths, science, humanities and modern languages. While around 22% of our sample achieved six or more A*–C grades in these subjects, nearly 50% achieved at least four A*–C grades in these key GCSEs. Given that performance tables typically focus on five A*–C grades, we choose to focus on achieving five or more A*–C grades in EBacc subjects in our results. The results from the other potential cut-offs are included in the appendix.

At Key Stage 1 and Key Stage 2, there is an established consensus on measures of high attainment and, as such, high attainment is defined based on reaching an 'above average' level in English/reading and maths. At Key Stage 2, where level 4 is the expected level of attainment, this is defined as level 5 or above. At Key Stage 1, where level 2 is the expected level of attainment, it is defined as level 3 or above. At Key Stages 1 and 2, around 18–19% of our sample reached this level of attainment in both English/reading and maths.

Part of our analysis also involves some simple regression models, which enable us to account for a richer set of measures of attainment at each Key Stage, even amongst our group of high achievers. Details of the measures used for this analysis can be found in the notes to Figure A4.

Measuring background

One of our key research questions is the extent to which attainment trajectories vary by family background. We consider a number of alternative measures of family background in order to compare attainment at various points of the distribution of socio-economic status. For those educated in the state system at secondary school, we compare those who ever claim FSM with

³ See indicator 9 at <https://www.gov.uk/government/publications/social-mobility-indicators/social-mobility-indicators#attainment-by-age-19-by-free-school-meal-eligibility>.

⁴ The data do not allow us to perfectly observe attainment at the end of post-compulsory education. For example, not all students take A levels and we have much less information about other types of qualifications. We also only observe results for students if they take their exams in the expected academic year; if they were to retake any exams and improve their grade, then we would not be capturing these increases in attainment. There may also be missing data for other reasons, e.g. absence on the day of the test or poor linkage. This may help to explain why, even at the very highest-ranked institutions, not all students appear to have achieved relatively low A-level benchmarks.

those who never claim FSM, and those who have always claimed FSM with those who have not always claimed FSM. These measures focus, respectively, on the bottom 18.8% and the bottom 6.6% of the distribution compared with the rest (Figure 3).

To compare alternative parts of the distribution amongst state school students, we additionally use a measure based on an index of socio-economic status created using individuals' FSM eligibility and a set of local-area characteristics linked in on the basis of their home postcode at age 16. These measures include their IMD score, their ACORN type, and a set of three measures of socio-economic status from the Census: the proportion of individuals who work in professional or managerial jobs, the proportion of highly educated individuals and the proportion who own their home.⁵ State school students are divided into five equally sized groups (quintile groups) on the basis of this index, and we compare the bottom and top quintile groups – the most and least deprived.

Finally, we can observe the type of secondary school that the child attended. We compare those who went to a non-selective state secondary school with those who went to a selective state secondary school or a private secondary school. While we cannot observe any measures of socio-economic status for those attending private secondary schools, the majority of children will be fee-paying and therefore are highly likely to be from more affluent families. Of those attending selective secondary schools, 70% are in the top two quintiles of our measure of the socio-economic status distribution.

Methodological challenges

The first part of our analysis is largely descriptive, summarising the outcomes and attainment levels of children from different socio-economic backgrounds. We additionally include some regression results, to enable us to account for richer measures of attainment, even amongst our group of high achievers. To do so, we use probit models, regressing a binary indicator for whether the young person attended a high-status university at age 18 or 19 on a rich set of measures of attainment at each Key Stage.

For the second stage of our analysis, when we look forward from a child's educational attainment at age 7 to see how their attainment progresses, we have to take into account a number of methodological challenges relating to modelling educational trajectories. Previous work has highlighted the challenge of modelling the trajectories of higher-achieving pupils from disadvantaged backgrounds.⁶ The challenge arises because of the statistical phenomenon of 'regression to the mean', which implies that some particularly high (or particularly low) scores are down to 'luck' as much as ability. Children with these scores are unlikely to be so 'lucky' next time they are tested, which means it will appear that the ability of initially high-scoring children has fallen (and that of initially low-scoring children has increased).

Because children from more deprived backgrounds tend to have lower educational attainment, on average, than those from less deprived backgrounds, poorer students who score particularly

⁵ See Chowdry et al. (2013) for further information on this measure, including how it compares with various individual measures of socio-economic status from surveys.)

⁶ Jerrim and Vignoles (2013).

highly in a test are more likely to have achieved that high score by 'luck', i.e. there is likely to be more measurement error in the test for these children; the opposite is true for children from better-off backgrounds: a particularly low score for this group may indicate that they were particularly 'unlucky' on the day of the test.

A select group of disadvantaged but high-achieving pupils identified at an early age may therefore show disproportionate relative decline in their academic achievement at least partly because of regression to the mean (RTM). Of course, there may well be a real phenomenon at work too, with such students genuinely falling behind their peers for whatever reason. Separating these effects is challenging, but we would ideally like to minimise the potential effect of RTM in order to identify whether and to what extent initially high-achieving children from poor backgrounds are caught up and perhaps even surpassed by lower-achieving children from richer families, as previous work has suggested may happen.⁷

We attempt to minimise the impact of RTM in two ways. First, we assign children to 'high', 'average' or 'low' achievement groupings on the basis of a different test from the ones we use to start following their attainment trajectory. To the extent that performance across different tests taken around the same time is likely to vary, this will break the link between a child's performance in one test, used to place them into achievement groupings, and a set of other tests, used as the starting point for their attainment trajectory. Second, we focus the majority of our discussion on the educational trajectories from Key Stage 2 onwards. To the extent that any 'luck' is unlikely to be repeated in two consecutive tests (in this case taken four years apart), this will minimise the effect of RTM since most of the regression to the mean should occur between the first and second tests (Key Stages 1 and 2). Focusing our discussion on Key Stage 2 onwards should therefore give a more reliable indication of the actual trajectories of different groups.

A further methodological challenge is to identify a group of young children who are deemed to have high potential, i.e. to be higher achievers at an early age. We define 'high achievement', 'average achievement' and 'low achievement' based on children achieving level 3 or above, level 2 and level 1 respectively in their Key Stage 1 writing tests. Figure 4 illustrates that 12.6% of our sample were defined as high achievers using this definition, with 73.0% defined as average achievers and 13.2% as low achievers. For robustness, we run an additional set of results where we instead define achievement based on the Key Stage 1 maths tests, with similar results. Note that we must be mindful that measuring academic achievement in very young children can be problematic and their scores are likely to include measurement error (indeed, this issue is related to the above issue on regression to the mean). While we recognise that these discrete levels may not be the best representation of initial achievement, we do the best that we can with the available data and our approach, combined with our robustness test, strengthens our confidence that our main findings from Key Stage 2 onwards are not driven by RTM.

⁷ Feinstein (2003); Jerrim and Vignoles (2013).

Figure 4 Defining early achievement and average attainment: descriptive statistics

	Average	Minimum	Maximum
<i>Key Stage 1 writing</i>			
Percentage level 3+ – high achievement	12.6		
Percentage level 2 – average achievement	73.0		
Percentage level 1 – low achievement	13.2		
Key Stage 1 writing missing	1.2		
Percentile KS1 – reading, maths and science	49.5	2	100
Percentile KS2 – English and maths	50.5	1	100
Percentile KS4 – points score	50.1	1	100
Percentile KS5 – points score	50.2	1	100
Percentile university – university ranking	50.4	1	100

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

To consider the later attainment of those who are high, average and low achievers at age 7, we require a ranking of all cohort members in terms of their attainment at each stage of their education. At each level, individuals are given a score based on their attainment, which is then standardised, and each individual is assigned a percentile within the distribution based on this performance. At Key Stage 1, given that we use writing to define achievement groupings, overall attainment is then defined as the sum of the child’s performance on their other Key Stage 1 test scores (reading, maths and science) so as to minimise any effect of RTM. For robustness where maths is used to define achievement, attainment is defined as the sum of the remaining Key Stage 1 test scores (reading, writing and science). Key Stage 2 attainment is measured using the combined total from the child’s fine grade scores in English and maths. The total GCSE point score provides a continuous measure of attainment at Key Stage 4.

When defining later attainment, at Key Stage 5 and university, we encounter issues in assigning a ranking for those who do not participate. For those who participate at Key Stage 5, attainment is defined based on their A-level point score or their Individual Learner Record (ILR) score for those missing A-level points. For those who do not participate, we assign individuals a probability of participation based on their prior attainment at Key Stage 4. Non-participants are always ranked below participants, but this assignment process allows us to differentiate those who may have had the grades to stay in education but chose not to do so from those whose attainment at Key Stage 4 was low enough that they would have been unlikely to have been able to stay on.

At university, we use a similar approach: for those who participate, we define their ranking based on the institution that they attend at 18/19. Individuals are assigned a rank according to their institution’s average score from the 2001 Research Assessment Exercise. Those who we observe to be participating in higher education but without an RAE score are coded below the bottom-ranked institution. For individuals who do not participate, we assign a ranking, always below those

who do participate, based on their probability of participation according to their prior attainment at Key Stage 5 and Key Stage 4.

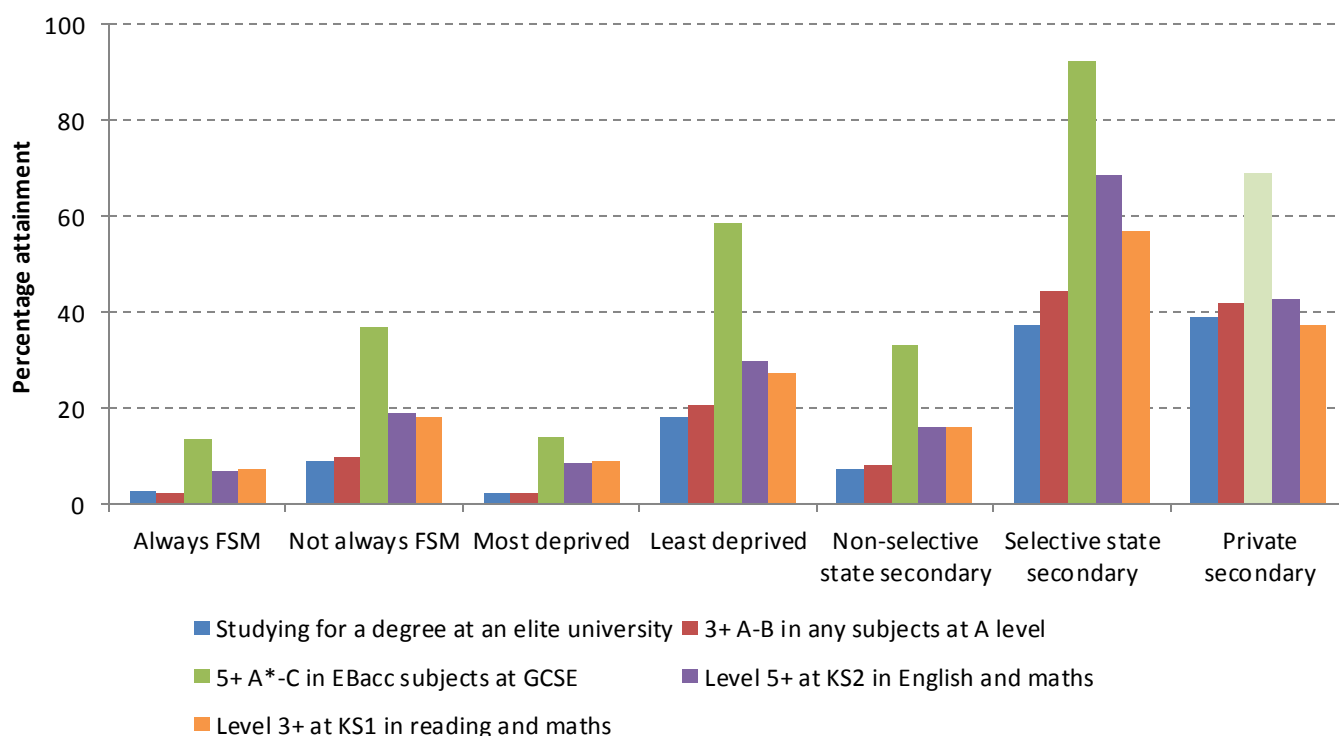
Figure 4 provides mean values for each score, while Figure A5 in the appendix disaggregates this by family background.

Results

Looking backwards – trends in prior attainment of those studying at high-status institutions at 18/19

Figure 5 shows the percentage of children reaching our definitions of high attainment at each level of education from university back to Key Stage 1 by alternative measures of family background and school type. Here we focus on state school children who always claim FSM compared with those who do not always claim FSM, the most and least deprived quintiles of the socio-economic status index (state school only) and the three alternative types of secondary schools that children attend. While we choose only one measure of high attainment to focus on at each stage, Figure A1 in the appendix contains further alternative measures of high attainment and figures for those who ever claim FSM compared with those who never claim FSM.

Figure 5 Percentage of sample reaching ‘high attainment’ at each education stage from university back to Key Stage 1 by family background and school type



Note: The subject data on private school children are unreliable in this year of data and so the GCSE results for private school children should not be considered here.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

The first point to note is how small the blue bars are, particularly for the most disadvantaged groups. Very few children from deprived families attend elite institutions. Of those born in 1991–92:

- 921 pupils who claimed FSM throughout secondary school (out of 33,039) went to an elite university.
- 2,248 of the most deprived children (out of 92,467) went to an elite university.
- If students from the most deprived families had the same chance of getting into an elite university as those from the least deprived families, then an extra 14,580 deprived children would attend one (18.2% rather than 2.4% – see Figure A1).

This large socio-economic gap in participation in elite institutions can be largely explained by lower prior attainment. We can see from Figure 5 that at every education stage, those from deprived backgrounds typically have lower attainment. Only 8.9% of the most deprived children reach level 3 in both reading and maths at Key Stage 1, compared with 27% of the least deprived children. At Key Stage 2, 7.1% of those who always claim FSM attain level 5 in English and maths, compared with 19% of those who do not always claim FSM. At Key Stage 4, 92% of selective state school children have at least five good GCSEs in EBacc subjects, compared with 33% of non-selective state school students. Note that the subject data on private school children are unreliable in this year of data and so the GCSE results for private school children should not be considered here.

Figures 6 and 7 plot socio-economic differences in the likelihood of going to a high-status university amongst groups with a given level of high prior attainment. Figure 6 shows the differences accounting for a rich set of measures of attainment – including subjects, qualifications and grades – *at the relevant Key Stage*; Figure 7 shows the differences after accounting for background characteristics, plus a rich set of measures of attainment *at all Key Stages*.⁸

Figure 6 shows that there remain very large socio-economic differences in the likelihood of participating at a high-status institution amongst those who are high attainers at Key Stages 1 and 2. The differences are much smaller – but remain sizeable in some cases – when we focus on those who are high attainers at Key Stages 4 and 5. Figure 7 shows that the remaining differences between pupils from different socio-economic backgrounds with apparently similar attainment *at a particular Key Stage* can, however, be further reduced by taking account of the other ways in which these individuals differ. For example, amongst high attainers at Key Stage 1, those from lower socio-economic backgrounds are less likely to go on to be high attainers in subsequent Key Stages. Once we account for this, the differences in the likelihood of going to a high-status university are substantially reduced, although significant differences remain between the most and least deprived state school students and between those who attend private schools and those who attend non-selective state schools.⁹

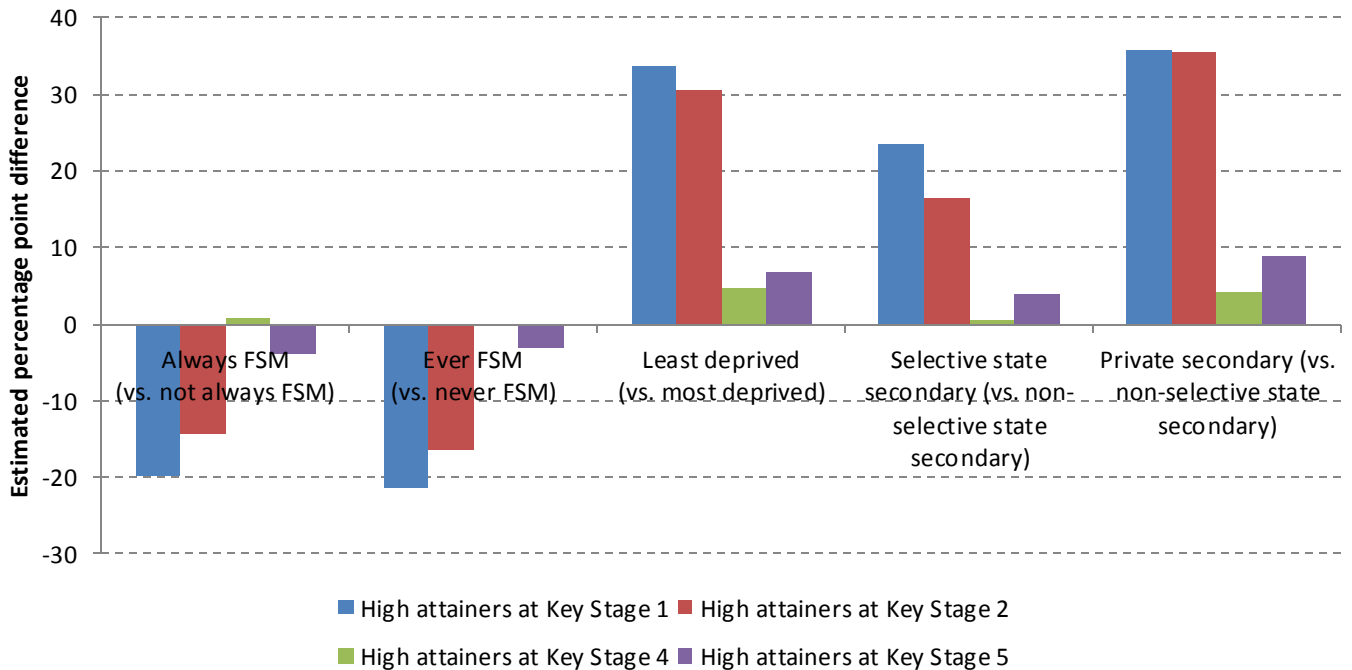
Interestingly, the differences between the most and least deprived are smaller if we condition only on Key Stage 4 attainment than if we condition only on Key Stage 5 attainment. This seems plausible: Key Stage 4 results are observed by universities at the time that offers are made, while

⁸ The coefficient estimates underlying Figures 6 and 7, together with their significance levels, are shown in Figure A4, which also includes full details of the controls used in each case. As there were some issues with the Key Stage 4 data for private school students amongst those who sat their GCSEs in 2008, we reran our analysis using the 2007 cohort as a robustness check, with broadly similar results (available from the authors on request).

⁹ The remaining differences by school type can, however, be largely eliminated if we additionally account for individual measures of SES in the same regression (see bottom panel of Figure A4). This suggests that it is the background of the individuals themselves that is driving this relationship, rather than that there is a significant private school effect.

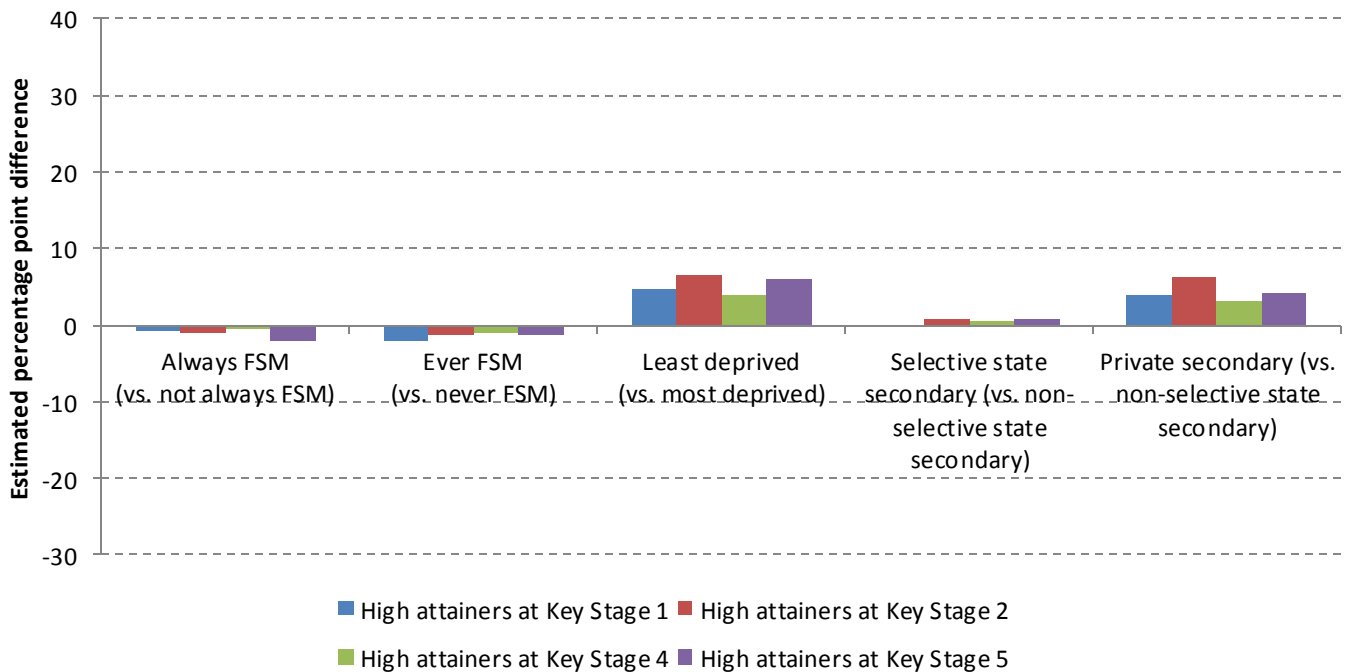
final Key Stage 5 results are often not; hence it seems reasonable that Key Stage 4 results provide greater explanatory power for decisions about participation in higher education.

Figure 6 Socio-economic differences in the likelihood of attending an elite university at 18/19 given prior 'high attainment' at each education stage



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure 7 Socio-economic differences in the likelihood of attending an elite university at 18/19 given prior 'high attainment' at each education stage and including a full set of controls



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

This highlights the crucial role played by attainment at Key Stage 4 in explaining subsequent education choices and performance. Indeed, recent research finds that, even after accounting for a rich set of measures of attainment at Key Stage 5, each additional GCSE at grade A* in an EBacc subject is associated with a 0.5–1 percentage point increase in the likelihood of attending a high-status university.¹⁰ This reinforces the potential importance of ensuring that high-attaining children from poor backgrounds are attaining high grades at Key Stage 4.

Whilst the socio-economic gaps are small once we account for background characteristics and a rich set of measures of attainment from Key Stage 1 to Key Stage 5, there remain significant differences in the likelihood of attending an elite institution between young people on the basis of some measures of socio-economic background. For example, state school students from the least deprived backgrounds are 5.9 percentage points more likely to attend an elite institution than state school students from the most deprived backgrounds, even after accounting for a rich set of controls. Similarly, those attending private secondary schools are 4.3 percentage points more likely to attend a high-status institution than those with similar characteristics and prior attainment levels who attend non-selective state secondary schools (although this difference can largely be eliminated by the inclusion of individual measures of SES in addition to school type). Further research could usefully explore the drivers of these small remaining differences in high-status participation by individual socio-economic background.

Overall, these results suggest that:

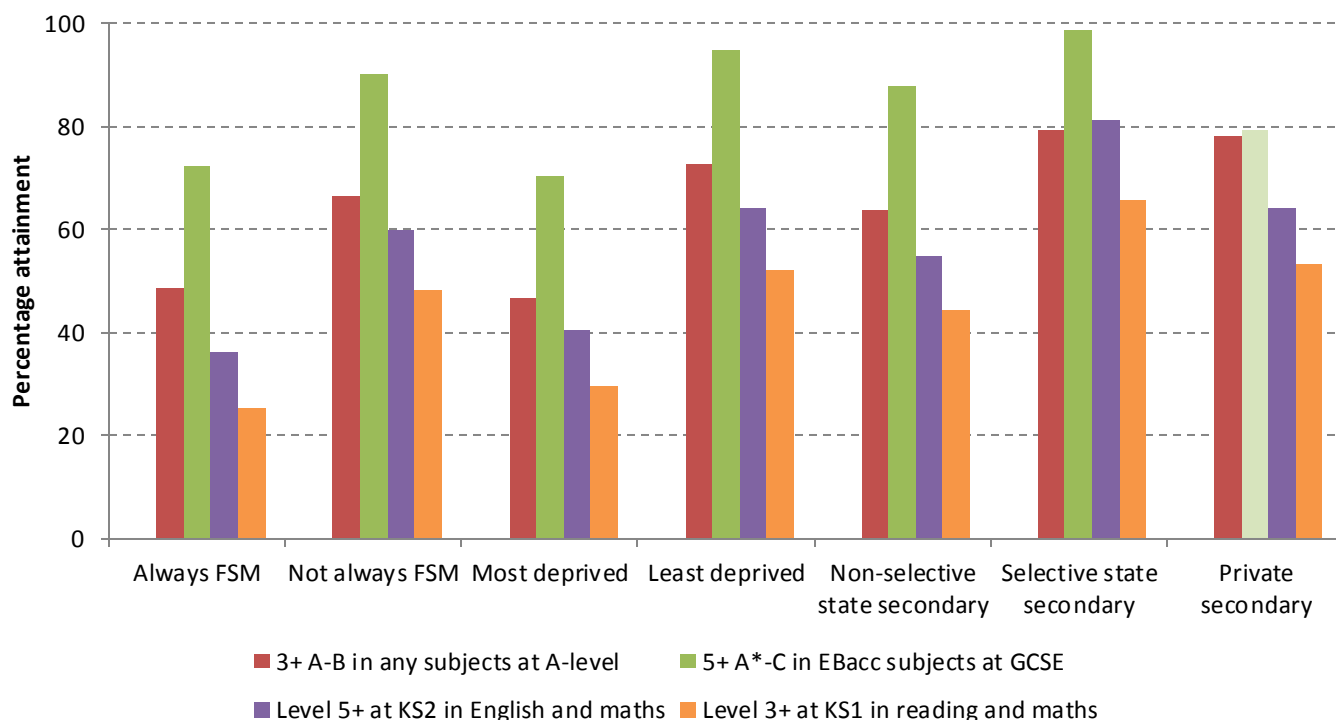
- Early tests are much better predictors of attending an elite university for more affluent students.
- On average, students from more advantaged backgrounds are more likely to start with high attainment and maintain their high levels of achievement throughout, i.e. they have more consistently high attainment than students from poorer backgrounds.
- Of 7,853 children from the most deprived homes who achieve level 5 in English and maths at age 11 (8.5%, Figure A1), only 906 (11.5%) make it to an elite university. If they had the same trajectory as a child from one of the least deprived families, then 3,066 of these children would be likely to go to an elite university (39.0%) – suggesting that 2,160 children are falling behind.
- This highlights the important role played by prior attainment in explaining socio-economic differences in the likelihood of attending an elite institution.

Figures 8 and A2 complement this analysis by examining the proportion of pupils who make it to a high-status institution at 18/19 who had high prior attainment at each previous stage.

Unsurprisingly, they show that the percentage of those attending high-status institutions who are high attainers is much higher than the percentage of high attainers in the population as a whole. For example, just 2.5% of pupils who were eligible for free school meals throughout secondary school achieved at least three A–B grades at A level (see Figure A1), but nearly half of those who make it to high-status institutions achieve the same benchmark.

¹⁰ Crawford (2014).

Figure 8 Percentage of those who attend elite universities at 18/19 reaching 'high attainment' at each education stage from Key Stage 5 back to Key Stage 1 by family background and school type



Note: The subject data on private school children are unreliable in this year of data and so the GCSE results for private school children should not be considered here.

Source: Analysis of NPD-ILR-HESA data for a cohort born in 1991-92.

However, even amongst those who do attend elite institutions, there is still a strong social gradient in terms of the likelihood of reaching earlier high achievement benchmarks: for example, 71% of the most deprived children have at least five good GCSEs in EBacc subjects at GCSE compared with 95% of the least deprived children. At Key Stage 5, 47% of the most deprived children who enrol in elite institutions achieve at least three A or B grades, compared with 73% of the least deprived children. Therefore those children from deprived families who do make it to elite institutions do so with lower grades than children from more affluent families.

There are a number of possible explanations for this. First, it may be that poorer students tend to attend somewhat less elite universities within the group of high-status institutions that we consider. We find some evidence to support this: Figure A3 repeats Figure A2 for the so-called 'Golden Triangle' of Oxford, Cambridge, University College London and Imperial, to check whether the apparent difference in prior attainment exists for the highest-status institutions. While, as is to be expected, many more young people who attend these institutions have high prior attainment, there is still some evidence that those from poorer families enter these institutions with lower prior attainment than their more advantaged counterparts. These differences are starkest when we focus on young people from the most versus least deprived backgrounds; the gaps for other groups can largely be explained by differences in the proportion of students from different backgrounds who take A levels.¹¹

¹¹ Those individuals attending Golden Triangle institutions who do not appear to take Key Stage 5 exams at age 18 are relatively high attainers at earlier Key Stages. Further research is therefore needed to understand the routes

Second, it could be that students from poorer backgrounds enter high-status institutions with lower grades, on average, than those from richer backgrounds because students from less deprived backgrounds exceed their grade offers to a greater extent than students from more deprived backgrounds. Third, it is possible that some elite universities may be using contextualised admissions processes and accounting for the circumstances of children when making entry offers. Further research could usefully explore the potential role of contextual admissions policies in reducing the socio-economic gap in participation at high-status institutions.

There is an apparent contradiction between the facts that children from the most deprived families are less likely to attend an elite university for a given level of prior attainment, but that those who do attend have lower prior attainment than their more affluent counterparts. One way to reconcile this apparent contradiction would be if children from more deprived families were less likely to apply to elite institutions, but more likely to get in with a given set of grades conditional on applying. Unfortunately, we do not have access to applications data and so cannot verify whether this is true or not. However, if this is the case, then it would imply that, in addition to the potentially crucial role for policy intervention to improve attainment at Key Stage 4, more could also be done at Key Stage 5 to encourage those from more deprived backgrounds to apply to high-status institutions.

Looking forwards – later attainment of those who have high, average and low achievement at age 7

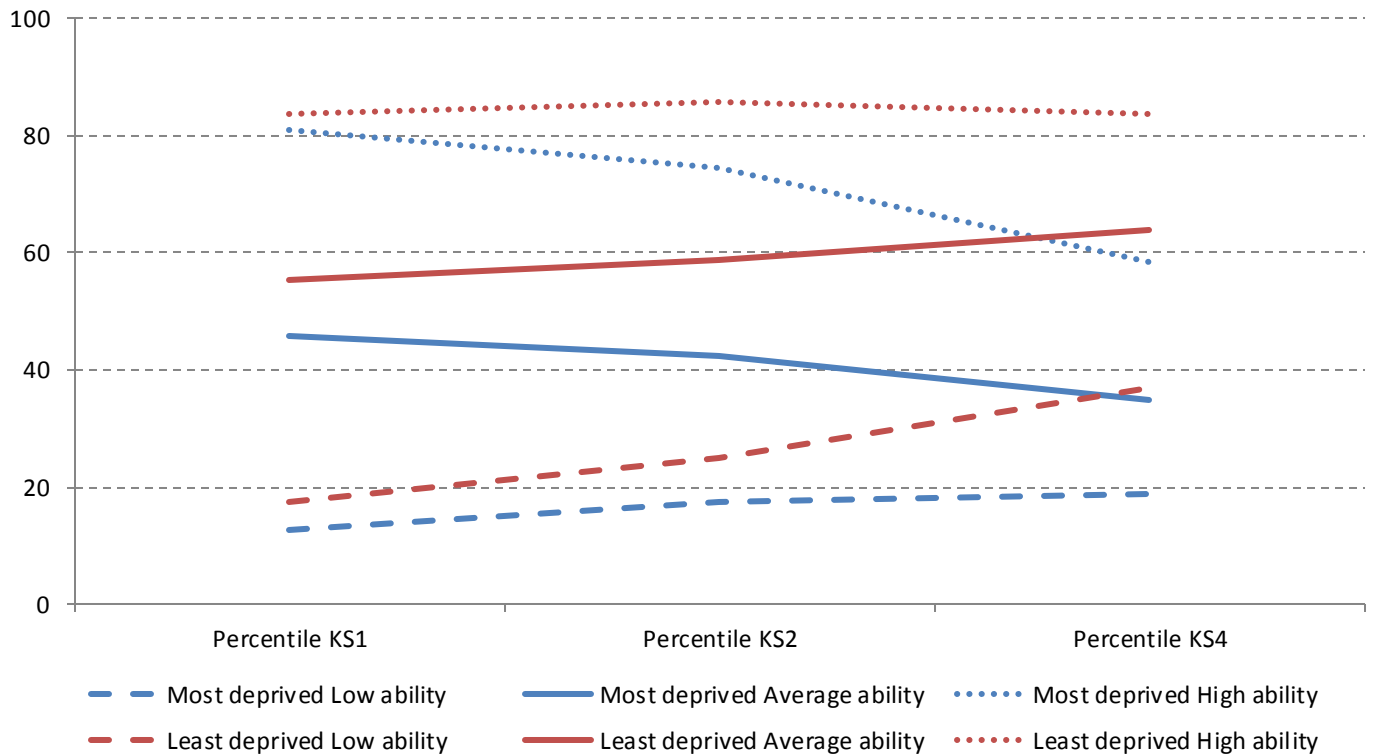
We now switch our attention to looking forward, considering the later attainment trajectories of those who are high, average and low performers in their Key Stage 1 tests at age 7 and how this varies by family background.

Figure 9 plots the average percentiles of those from the most and least deprived families who were high, average and low achievers in their age 7 writing test at Key Stage 1 (see Figure A5 for descriptive statistics by background). It can be seen that lower-achieving affluent children catch up with higher-achieving deprived children between Key Stage 2 and Key Stage 4. Conversely, high-achieving children from the most deprived families perform worse than lower-achieving students from the least deprived families by Key Stage 4. Note that most of the movement occurs between Key Stage 2 and Key Stage 4 – this is less likely to be driven by regression to the mean, as our achievement groupings are defined at Key Stage 1 and using a different test so that any mean reversion driven by measurement error is likely to occur between Key Stage 1 and Key Stage 2.

We test the robustness of these findings by using an alternative measure of achievement at Key Stage 1, defining high, average and low achievement based on children's performance in Key Stage 1 maths rather than writing. Attainment at Key Stage 1 is then the combined score in the three other tests at Key Stage 1 (reading, writing and science – see Figure A7 for descriptive statistics). Figure A8 illustrates that the pattern seen in Figure 9 is even stronger when maths is used to define achievement: high-achieving children from the most deprived families fall behind lower-achieving children from the most affluent families, while low-achieving children from the most affluent families catch up with higher-achieving children from the most deprived families.

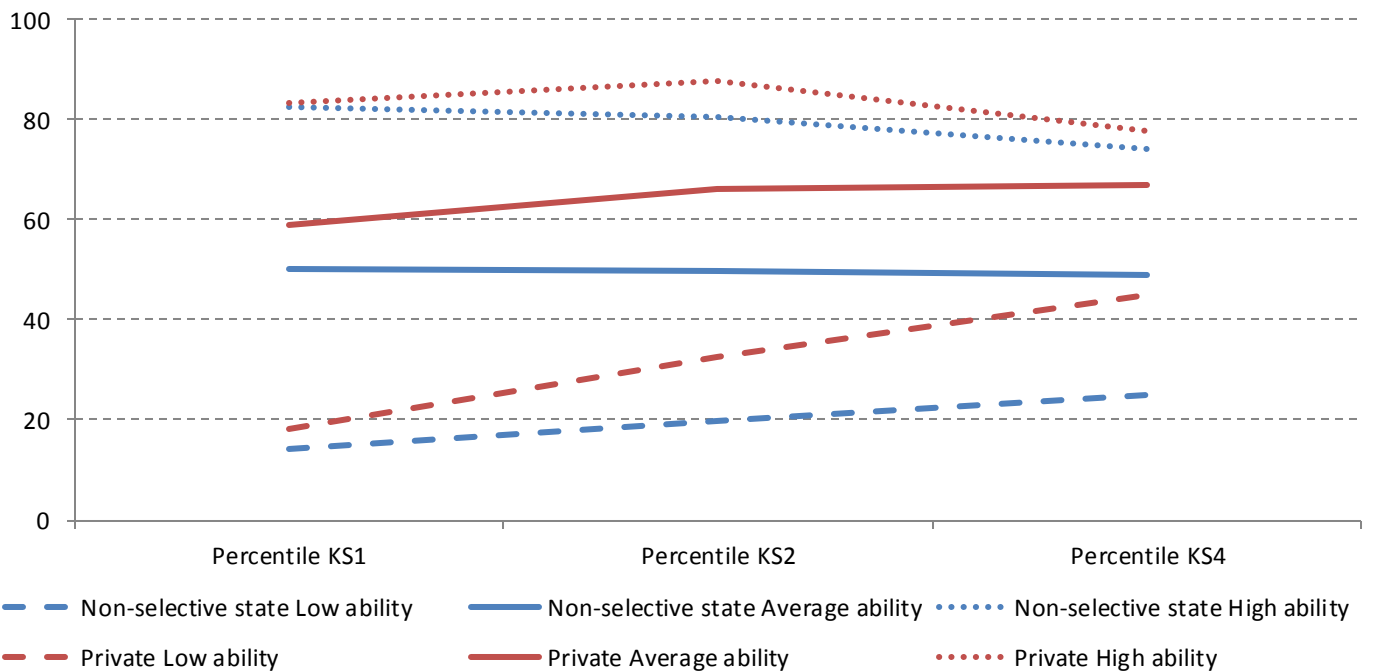
through which individuals with apparently low qualifications at Key Stage 5 are able to access a group of highly selective institutions, but this goes beyond the scope of this project.

Figure 9 Trajectories from Key Stage 1 to Key Stage 4 by early achievement (defined using KS1 writing) for the most deprived and least deprived quintiles of socio-economic status (state school only)



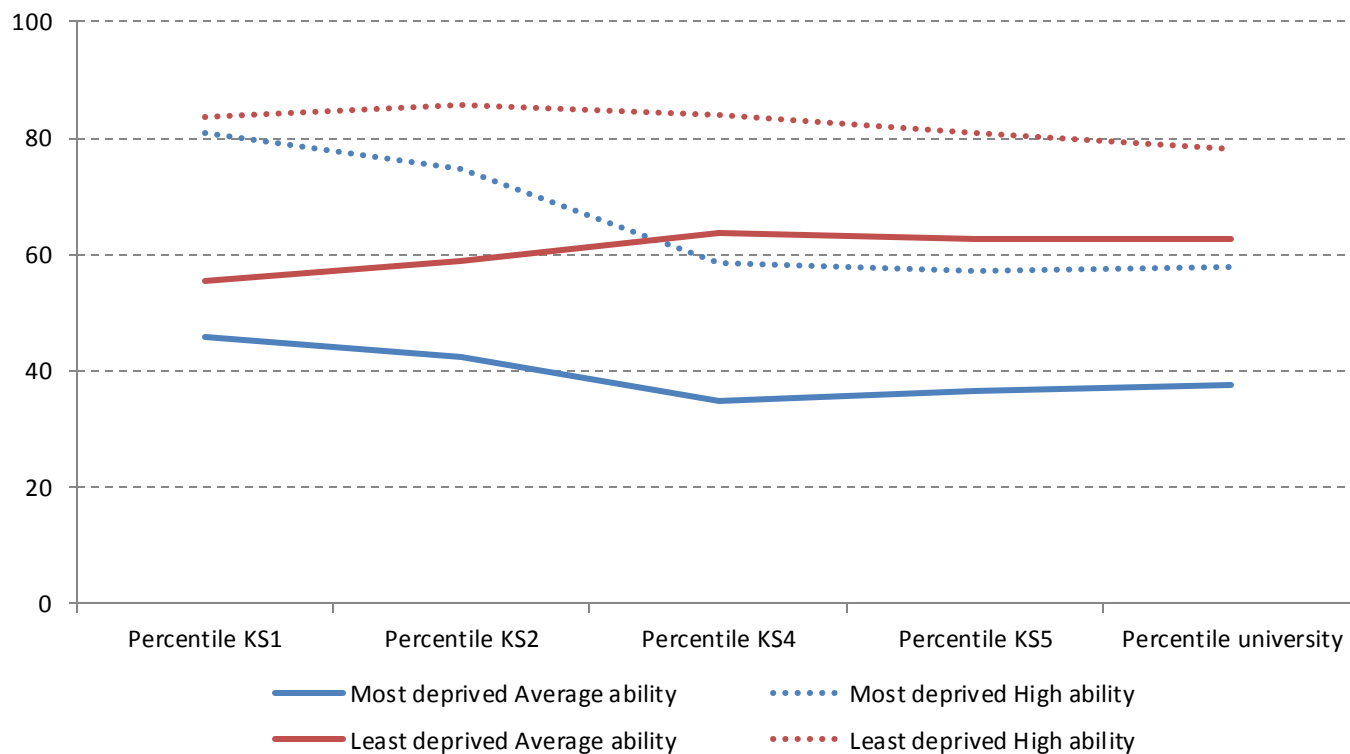
Source: National Pupil Database for a cohort born in 1991–92.

Figure 10 Trajectories from Key Stage 1 to Key Stage 4 by early achievement (defined using KS1 writing) for those who attend non-selective state and private secondary schools (all state educated in primary school)



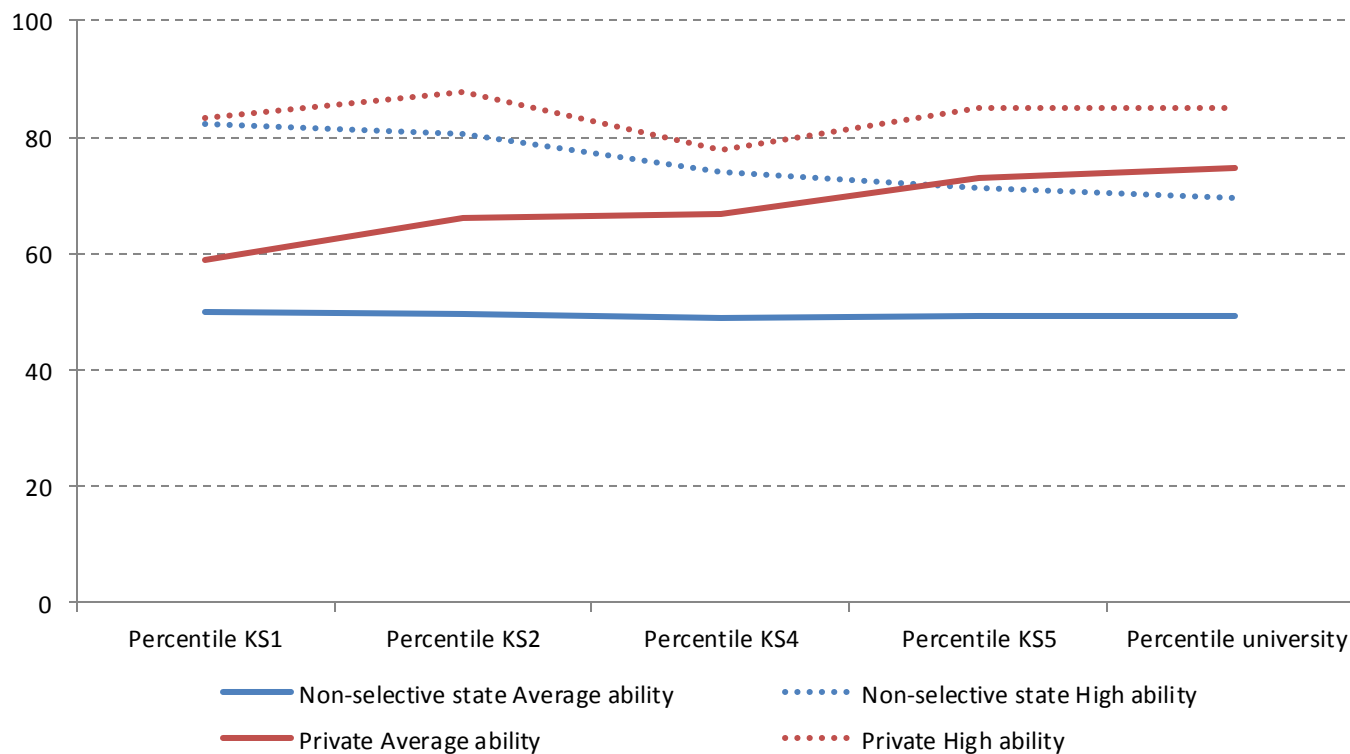
Source: National Pupil Database for a cohort born in 1991–92.

Figure 11 Trajectories across Key Stages by early achievement (defined using KS1 writing) for the most deprived and least deprived quintiles of socio-economic status (state school only)



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure 12 Trajectories across Key Stages by early achievement (defined using KS1 writing) for those who attend non-selective state and private secondary schools (all state educated in primary school)



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

We can consider the same picture as Figure 9 for an alternative measure of family background, comparing those from non-selective state schools and those from private secondary schools (Figure 10). We again see a similar pattern: low-achieving private school children catch up with higher-achieving state school children by Key Stage 4 (see Figures A9–A11 for further alternative measures of family background). These results highlight the potential importance of secondary school as a period of policy intervention to ensure that high-attaining children from poor backgrounds do not fall off the high attainment trajectory between Key Stage 2 and Key Stage 4.

We can extend this picture beyond Key Stage 4 to consider how these trajectories change at Key Stage 5 and university. Note that many of the low-achieving group do not participate at Key Stage 5 or university, regardless of background (Figure A6). We therefore exclude these individuals from the analysis when focusing on later trajectories. As can be seen from Figure 11, the trajectories do not appear to move much after Key Stage 4, with the majority of the movement occurring between Key Stages 2 and 4.

If we consider non-selective state-educated children compared with privately educated children (Figure 12), however, we do see some evidence of average private school students catching up with higher-achieving state school students at Key Stage 5. This may be indicative of private schools (or the parents of private school pupils) being particularly good at encouraging their pupils to stay on at Key Stage 5, take subjects that are more highly valued by universities, achieve well in their examinations, and apply to and secure places at higher-ranked universities.¹²

Conclusions

Our report concludes that poorer students are less likely to enrol in elite universities primarily because they have lower prior achievement, confirming previous empirical evidence on this issue. Poorer students have lower average achievement at each stage of their education and even those who start strongly with higher achievement at Key Stages 1 and 2 are more likely to fall off their high achievement trajectory than their wealthier peers. The achievement of students from poorer backgrounds is particularly likely to fall away between Key Stage 2 and Key Stage 4, making secondary school a potentially important area of intervention for policymakers interested in increasing participation at high-status universities amongst young people from more deprived backgrounds.

Our research suggests that it is especially important to ensure that young people from more deprived backgrounds are attaining high grades at Key Stages 4 and 5. That said, there remain small advantages for state school students from the least deprived backgrounds (compared with those from the most deprived backgrounds) and for pupils who attend private secondary schools (compared with students who attend non-selective state secondary schools) in terms of their likelihood of enrolling in a high-status institution, even after allowing for differences in a range of background characteristics and a rich set of measures of attainment from Key Stage 1 to Key Stage 5. Further research could usefully explore the drivers of these small remaining gaps.

¹² Crawford (2014) examines these patterns in more detail.

More positively, our research suggests that poorer students who do make it into an elite institution tend to have lower prior achievement than their wealthier peers. There are a number of possible explanations for this, including the fact that students from poorer backgrounds may be more likely to attend the least selective institutions amongst our group of high-status universities than their peers from richer backgrounds. However, we find that there remain significant differences even amongst the most elite institutions between those from the most and least deprived backgrounds, which is consistent with the possibility of positive action by some universities to help poorer students enrol in elite institutions by giving them lower entry offers. Alternatively, it may simply be that poorer students exceed their offer grades by less than their wealthier peers. This issue needs further research. Either way, it is important that universities and policymakers provide students from poorer backgrounds with advice to encourage greater numbers of applications from these students to elite institutions, as those with the top grades stand a very good chance of getting in if they do apply.

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Appendix A

Figure A1 Average levels of high attainment by background for the whole sample

	Ever FSM	Never FSM	Always FSM	Not always FSM	Most deprived	Least deprived	Non-selective state secondary	Selective state secondary	Private secondary
Studying for a degree at an elite university	2.7	9.9	2.8	8.9	2.4	18.2	7.4	37.3	38.9
3+ A–B in facilitating subjects at A level	0.6	3.2	0.7	2.9	0.6	6.5	2.2	16.2	15.3
2+ A–B in facilitating subject at A level	1.5	7.1	1.5	6.3	1.3	13.6	5.0	31.9	30.4
1+ A–B in facilitating subject at A level	3.4	13.7	3.6	12.3	3.2	24.5	10.3	51.5	47.7
3+ A–B in any subjects at A level	2.4	11.0	2.5	9.9	2.2	20.6	8.1	44.5	41.8
2+ A–B in any subject at A level	4.5	17.4	4.6	15.7	4.1	30.3	13.3	57.9	54.2
1+ A–B in any subject at A level	7.9	25.6	8.1	23.3	7.4	41.4	20.5	70.2	65.8
Percentage taking A levels	30.0	56.8	31.0	53.2	30.9	72.2	50.3	90.7	86.8
6+ A*–C in EBacc subjects at GCSE ^a	6.3	24.0	5.8	21.7	5.9	39.4	18.5	78.3	
5+ A*–C in EBacc subjects at GCSE	14.1	40.5	13.6	37.1	14.0	58.8	33.4	92.4	
4+ A*–C in EBacc subjects at GCSE	23.7	53.8	23.4	49.9	24.1	71.2	46.3	97.3	
Level 5+ at KS2 in English and maths	7.7	20.6	7.1	19.0	8.5	29.9	16.3	68.5	43.0
Level 5+ at KS2 in English or maths	23.7	44.5	22.1	41.9	25.2	56.7	38.6	93.8	70.5
Level 3+ at KS1 in reading and maths	8.3	19.7	7.5	18.3	8.9	27.4	16.1	56.9	37.3
Level 3+ at KS1 in reading or maths	21.0	38.8	19.1	36.6	22.5	48.8	33.7	82.0	60.7
N	94,036	406,596	33,039	467,593	92,467	104,118	482,354	18,278	20,352

^a There is an issue with missing data for private school students' maths exams in this year.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A2 Prior attainment, conditional on attending an elite university, by background

	Ever FSM	Never FSM	Always FSM	Not always FSM	Most deprived	Least deprived	Non-selective state secondary	Selective state secondary	Private secondary
3+ A–B in facilitating subjects at A level	13.7	20.3	14.0	20.0	13.4	22.9	18.3	28.0	27.7
2+ A–B in facilitating subject at A level	30.6	44.5	31.8	44.0	29.8	49.1	41.2	57.0	56.5
1+ A–B in facilitating subject at A level	53.8	71.4	55.6	70.6	52.5	76.1	67.9	83.2	81.9
3+ A–B in any subjects at A level	49.2	67.3	48.6	66.6	46.7	72.6	63.7	79.4	78.2
2+ A–B in any subject at A level	65.7	82.7	66.0	82.0	63.2	87.1	79.9	90.8	90.1
1+ A–B in any subject at A level	75.0	89.3	76.1	88.7	72.4	92.7	87.3	94.6	93.8
Percentage taking A levels	91.2	97.3	92.4	97.0	90.3	98.4	96.5	99.1	98.4
6+ A*–C in EBacc subjects at GCSE ^a	45.8	72.9	42.0	71.9	44.6	79.6	67.4	91.9	
5+ A*–C in EBacc subjects at GCSE	73.1	90.8	72.3	90.1	70.5	94.7	88.0	98.8	
4+ A*–C in EBacc subjects at GCSE	87.0	96.4	87.2	96.0	85.0	98.3	95.0	99.8	
Level 5+ at KS2 in English and maths	39.6	60.4	36.1	59.7	40.3	64.1	55.0	81.4	64.2
Level 5+ at KS2 in English or maths	68.9	86.7	66.3	85.9	70.0	89.2	83.2	97.8	89.5
Level 3+ at KS1 in reading and maths	28.4	48.9	25.2	48.1	29.7	52.0	44.2	65.7	53.3
Level 3+ at KS1 in reading or maths	51.9	73.5	47.3	72.8	53.2	76.8	69.3	87.5	78.0
N	2,569	40,165	921	41,813	2,248	18,979	35,911	6,823	7,915

^a There is an issue with missing data for private school students' maths exams in this year.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A3 Prior attainment, conditional on attending a Golden Triangle university, by background

	Ever FSM	Never FSM	Always FSM	Not always FSM	Most deprived	Least deprived	Non-selective state secondary	Selective state secondary	Private secondary
3+ A–B in facilitating subjects at A level	60.5	65.0	59.4	64.8	57.3	66.2	63.5	67.8	65.3
2+ A–B in facilitating subject at A level	75.7	86.7	75.0	86.3	73.9	89.1	84.6	89.9	85.5
1+ A–B in facilitating subject at A level	84.2	94.5	84.4	94.2	83.3	96.2	93.0	96.6	93.4
3+ A–B in any subjects at A level	82.5	94.5	78.1	94.2	79.7	96.5	92.9	96.4	92.0
2+ A–B in any subject at A level	84.8	95.8	81.3	95.5	84.8	97.3	94.6	97.1	94.0
1+ A–B in any subject at A level	86.4	96.3	84.4	96.0	85.5	97.6	95.2	97.4	94.7
Percentage taking A levels	92.1	98.4	89.1	98.2	93.5	99.1	97.5	99.3	98.6
6+ A*–C in EBacc subjects at GCSE ^a	68.9	87.8	64.1	87.3	67.4	91.8	83.4	95.5	
5+ A*–C in EBacc subjects at GCSE	87.6	97.3	87.5	97.0	87.7	98.6	95.8	99.3	
4+ A*–C in EBacc subjects at GCSE	92.7	98.9	90.6	98.7	92.8	99.7	98.1	99.8	
Level 5+ at KS2 in English and maths	65.5	83.7	54.7	83.3	65.2	86.7	79.5	91.0	84.4
Level 5+ at KS2 in English or maths	83.1	96.9	81.3	96.5	86.2	98.5	94.8	99.8	98.0
Level 3+ at KS1 in reading and maths	37.3	69.5	37.5	68.5	42.8	73.8	63.7	78.5	72.8
Level 3+ at KS1 in reading or maths	67.2	87.2	64.1	86.7	69.6	90.3	83.5	93.1	89.8
N	177	3,510	64	3,623	138	1,899	2,631	1,056	1,388

^a There is an issue with missing data for private school students' maths exams in this year.

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A4 Regression results: socio-economic differences in the likelihood of attending an elite university for individuals with a given level of high prior attainment^a (each measure of socio-economic status is included in a separate regression model)

	High attainers at KS1	High attainers at KS2	High attainers at KS4	High attainers at KS5
Only controlling for attainment at the relevant Key Stage				
Ever FSM	-0.214***	-0.164***	-0.003	-0.030**
Always FSM	-0.199***	-0.143***	0.008	-0.038**
2 nd SES quintile group	0.075***	0.067***	-0.005	-0.003
Middle SES quintile group	0.152***	0.131***	-0.008	-0.002
4 th SES quintile group	0.230***	0.201***	0.012*	0.022*
Top SES quintile group (least deprived)	0.337***	0.306***	0.048***	0.067***
Selective state secondary school	0.234***	0.165***	0.006	0.039***
Private secondary school	0.359***	0.356***	0.041***	0.090***
Controlling for background characteristics and attainment at all Key Stages				
Ever FSM	-0.021**	-0.013	-0.010*	-0.014
Always FSM	-0.009	-0.010	-0.006	-0.021
2 nd SES quintile group	0.002	0.003	-0.000	-0.001
Middle SES quintile group	0.012	0.007	-0.005	-0.004
4 th SES quintile group	0.026***	0.030***	0.014**	0.016
Top SES quintile group (least deprived)	0.048***	0.065***	0.039***	0.059***
Selective state secondary school	-0.000	0.007	0.005	0.007
Private secondary school	0.040***	0.062***	0.032***	0.043***

	Controlling for background characteristics and attainment at all Key Stages, and including SES quintiles and school type in the same regression			
2 nd SES quintile group	0.004	0.001	-0.004	-0.014
Middle SES quintile group	0.014	0.011	-0.001	-0.009
4 th SES quintile group	0.033***	0.038***	0.017**	0.011
Top SES quintile group (least deprived)	0.053***	0.071***	0.042***	0.047***
Selective state secondary school	0.001	0.008	0.006	0.008
Private secondary school	0.018*	0.027**	0.007	0.013

Note to Figure A4:

a) These models enable us to account for differences in attainment amongst the groups defined as high achieving at each level. For each regression, we use a subset of the controls listed below. Those that **are included** when individuals are defined as high achieving at a particular level are highlighted bold. So, for instance, in the top panel of the table the right-most column uses the controls that are in bold for Key Stage 5, while in the middle and bottom panels of the table it uses those plus all controls for Key Stages 1, 2 and 4 plus the background controls.

*** indicates significance at the 0.1% significance level; ** at the 1% significance level and * at the 5% significance level.

Background controls are: gender, ethnicity, whether English is an additional language, month of birth, special educational needs status and region.

Key Stage 1 controls are: binary indicators for whether the child was at **level 3, 2, 1 or working towards level 1** in reading, **writing** and maths (with level 2 – the expected level – as the reference category).

Key Stage 2 controls are: binary indicators for being in the **second, third, fourth or top quintile group** on the basis of achievement in English, maths and **science** (with the bottom group as the reference category in each case). When focusing on pupils who are high achieving at Key Stage 2, we additionally account for **a pupil's continuous Key Stage level in English and maths**.

Key Stage 4 controls are: **highest grade in English; highest grade in maths; number of GCSEs at grade A* in subjects that can be counted as part of the English Baccalaureate (other than English and maths, i.e. science, humanities and languages); number of GCSEs at grade A in these EBacc subjects; number of GCSEs at grade B in these EBacc subjects; number of GCSEs at grade C in these EBacc subjects; number of GCSEs at grades D–G in these EBacc subjects; number of GCSEs at grade A* in non-EBacc subjects; number of GCSEs at grade A in non-EBacc subjects; number of GCSEs at grade B in non-EBacc subjects; number of GCSEs at grade C in non-EBacc subjects; number of GCSEs at grades D–G in non-EBacc subjects;** number of GNVQs at grade A; number of GNVQs at grade B; number of GNVQs at grade C; number of GNVQs at grades D–G; (from the ILR/NISVQ data): whether the pupil achieved a Level 2 qualification by age 18; whether they achieved Level 2 via a non-academic (further education or vocational) route; quintile groups created on the basis of total points from Level 2 academic qualifications.

Key Stage 5 controls are: **number of A levels at grade A in 'facilitating' subjects (including English, maths, science, humanities and languages); number of A levels at grade B in facilitating subjects; number of A levels at grade C in facilitating subjects; number of A levels at grade D in facilitating subjects; number of A levels at grade E in facilitating subjects; number of A levels at grade A in other (non-facilitating) subjects; number of A levels at grade B in other subjects; number of A levels at grade C in other subjects; number of A levels at grade D in other subjects; number of A levels at grade E in other subjects;** quintile groups created on the basis of total points achieved at Key Stage 5; (from the ILR/NISVQ data);

whether the pupil achieved a Level 3 qualification by age 18; whether they achieved Level 3 via a non-academic (further education or vocational) route; quintile groups created on the basis of total points from Level 3 academic qualifications.

Source: Authors' calculations based on linked NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A5 Early achievement and average attainment by background

	Ever FSM	Never FSM	Always FSM	Not always FSM	Most deprived	Least deprived	Non-selective state secondary	Selective state secondary	Private secondary
<i>Key Stage 1 writing</i>									
Percentage level 3+ – high achievement	5.4	13.5	4.7	12.5	5.7	18.9	10.9	41.0	27.6
Percentage level 2 – average achievement	68.3	74.3	66.9	73.6	70.1	73.5	73.8	58.4	68.3
Percentage level 1 – low achievement	23.7	11.3	25.5	12.8	21.8	7.2	14.1	0.5	4.0
Average percentile KS1	38.2	51.4	36.6	49.8	39.7	57.8	47.9	75.2	63.8
Average percentile KS2	36.7	52.6	35.4	50.6	37.9	61.3	48.3	85.9	70.7
Average percentile KS4	31.8	53.4	31.8	50.6	32.2	65.5	47.9	86.3	68.9
Average percentile KS5	32.7	53.0	33.0	50.3	33.6	64.3	48.0	81.7	75.2
Average percentile university	34.2	52.8	34.9	50.3	34.6	63.7	48.2	79.3	76.6

Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A6 Participation and average scores at KS5 and university by background and ability

	Ever FSM	Never FSM	Always FSM	Not always FSM	Most deprived	Least deprived	Non-selective state secondary	Selective state secondary	Private secondary
High achievement									
KS5 participation	60.4	83.4	60.9	82.0	61.1	90.2	79.8	93.7	94.4
KS5 percentile	57.0	74.5	56.3	73.5	57.2	80.7	71.2	86.1	84.9
Average achievement									
KS5 participation	33.5	57.1	35.1	54.1	34.0	71.3	51.9	88.6	85.7
KS5 percentile	35.8	53.0	36.5	50.8	36.4	62.8	49.1	78.7	72.9
Low achievement									
KS5 participation	15.4	25.9	17.1	23.2	15.4	37.7	22.4	85.6	55.2
KS5 percentile	20.5	29.8	21.4	27.5	20.5	38.6	26.7	73.3	50.6
High achievement									
University participation	44.8	69.5	44.7	68.0	45.1	79.4	64.7	86.4	83.4
Elite university participation	11.2	27.1	11.5	26.2	9.5	37.7	22.8	46.4	58.3
University percentile	57.6	72.4	57.6	71.6	57.7	78.2	69.6	82.8	85.0
Average achievement									
University participation	22.5	40.9	24.6	37.6	21.6	54.7	35.6	77.5	74.6
Elite university participation	2.8	8.1	3.0	7.4	2.4	14.7	6.4	31.0	32.8
University percentile	37.3	52.9	38.5	50.9	37.4	62.5	49.4	76.9	74.6
Low achievement									
University participation	10.1	16.6	12.6	15.0	10.1	25.4	14.6	72.2	45.1
Elite university participation	0.9	1.8	1.0	1.6	0.8	3.5	1.4	28.9	10.6
University percentile	22.0	31.0	23.4	28.7	21.7	39.7	28.0	75.1	53.9

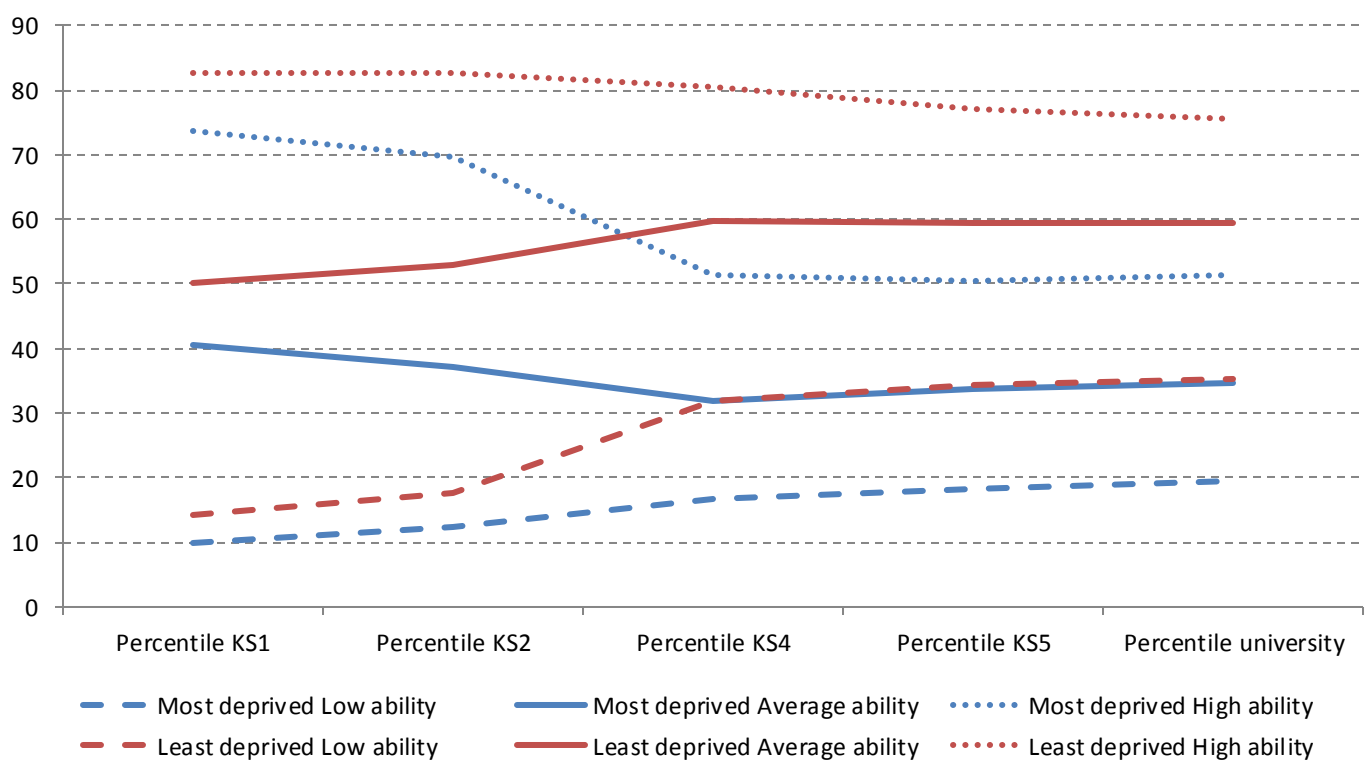
Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A7 Defining early achievement and average attainment using an alternative measure : descriptive statistics

	Average	Minimum	Maximum
<i>Key Stage 1 maths</i>			
Percentage Level 3+ – high achievement	23.9		
Percentage Level 2 – average achievement	67.4		
Percentage Level 1 – low achievement	8.7		
Key Stage 1 maths missing	0.0		
Percentile KS1 – reading, writing and science	50.9	3	100

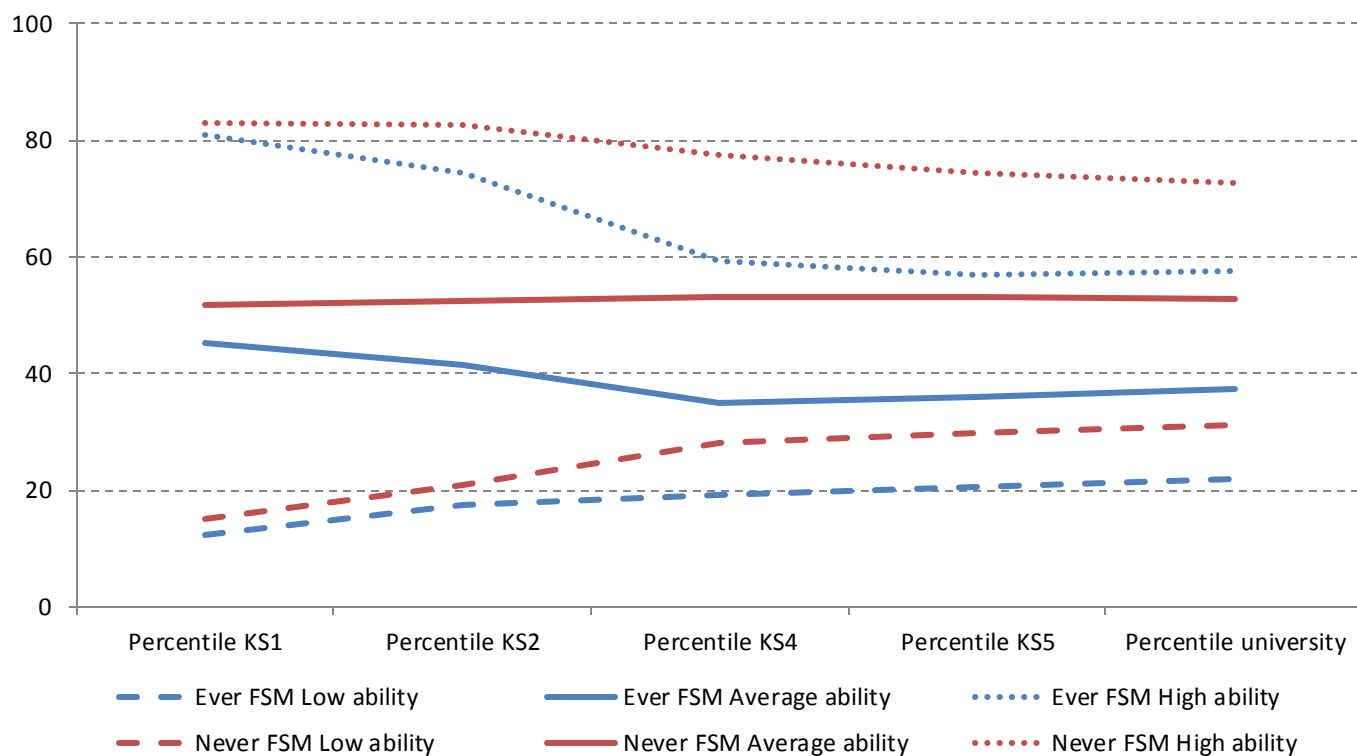
Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A8 Trajectories across Key Stages by early achievement (defined using KS1 maths) for the most deprived and least deprived quintiles of socio-economic status (state school only)



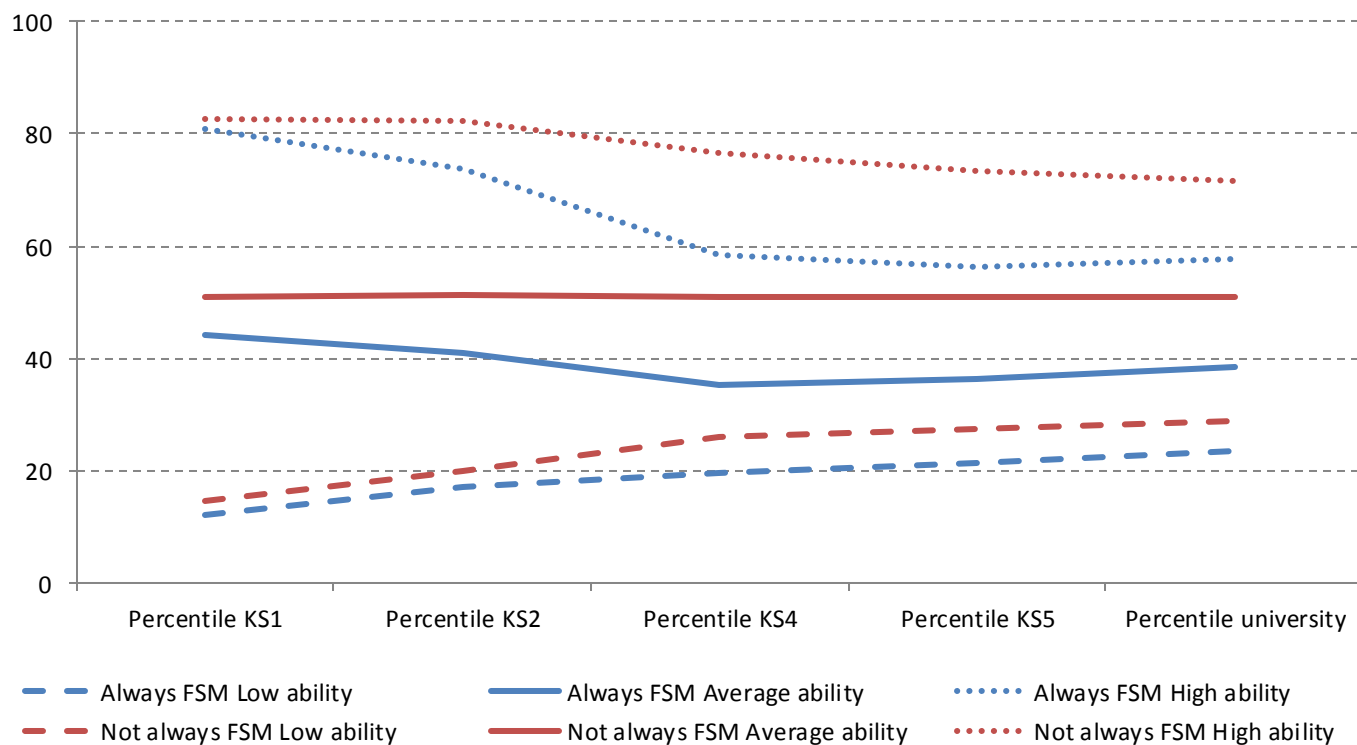
Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A9 Trajectories across Key Stages by early achievement (defined using KS1 writing) for those who ever claim FSM and those who never claim FSM in secondary school



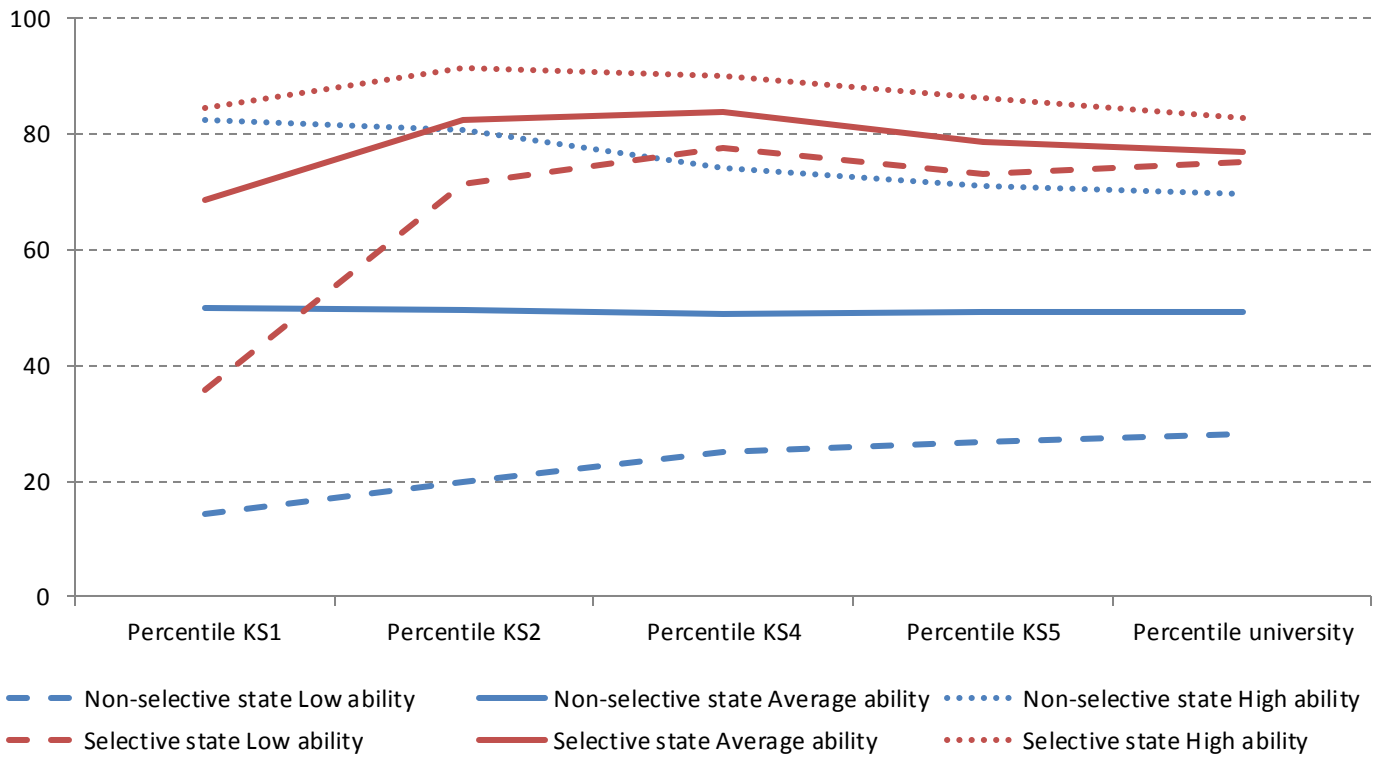
Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A10 Trajectories across Key Stages by early achievement (defined using KS1 writing) for those who always claim FSM and those who do not always claim FSM in secondary school



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.

Figure A11 Trajectories across Key Stages by early achievement (defined using KS1 writing) for those who attend non-selective and selective state secondary schools



Source: Analysis of NPD–ILR–HESA data for a cohort born in 1991–92.



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