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Issues paper

This report is for information

This report looks at the outcomes of the cohort of English-domiciled A-level students who entered full-time degree courses in 2007-08. We examine the extent to which a student's background affects their chance of obtaining an upper second or first class degree. The report updates and extends previous HEFCE research which analysed the cohort of 1997-98 entrants.

Differences in degree outcomes: Key findings

HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND

Contents

Differences in degree outcomes: Key findings

To	Heads of HEFCE-funded higher education institutions Secondary education providers
Of interest to those responsible for	Planning, Admissions, Widening participation, Advice to applicants to higher education
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Executive summary

Purpose

1. This report looks at the outcomes of the cohort of English-domiciled A-level students who entered full-time degree courses in 2007-08. We examine the extent to which a student's background affects their chance of obtaining an upper second or first class degree. The report updates and extends previous HEFCE research which analysed the cohort of 1997-98 entrants.

Context

2. Prior educational attainment is the main criterion used by higher education institutions (HEIs) to decide whether to make offers to or accept applicants. However, HEIs, further education colleges (FECs) and other HE providers also examine contextual data. Their aim is to set attainment against the background of the circumstances in which it is achieved. Information of this kind can be used to identify applicants with relative educational disadvantage, and it may be possible to make lower offers to such applicants on the basis that their potential is greater than their grades indicate. Specifically, a number of institutions consider what the average A-level achievement is at an applicant's school ('school performance'), and whether the school is in the state or independent sector ('school type').

3. In 2003 and 2005 HEFCE published statistical studies examining whether 'school performance' and 'school type' can safely be used to identify applicants with educational disadvantage and hence greater HE potential than their grades suggest. These studies found that students with similar prior attainment from independent schools do consistently less well at the end of their degree studies than students from other schools and colleges. This updated analysis confirms our earlier finding.

4. We have extended our analysis to consider other issues by including factors that were not explored in these previous studies. These include ethnicity, gender, additional schooling effects, GCSE attainment and postcode-based measures of disadvantage.

5. This analysis looks across the whole sector, tracking outcomes for the entire young A-level entrant 2007-08 cohort (130,000 students). This eliminates potential sampling biases. It also allows a robust and comprehensive examination of questions that smaller or institution-specific studies are unable to answer.

6. We have not attempted to identify the specific causes behind the findings. We can show, however, that some suggestions about differences in HE degree outcomes, while plausible, are not supported by the evidence. For example, it might be supposed that outcome differentials in HE were the direct result of the type of HEI the student attends, rather than the school they attended or some other aspect of their educational or socio-economic background. But the modelling techniques employed in the report eliminate this possibility: they make explicit allowance for differences in the performance of students in different HEIs. We can therefore be confident that our findings are not the result of institutional effects.

Key points

7. The study looks at all young students with three or more A-levels starting a full-time first degree in the academic year 2007-08, recording their degree achievements up to July 2011. The key findings of the study are as follows.

Students with better A-levels do better in higher education

8. More than 80 per cent of students with grades AAB or above gain a first or upper-second degree; approximately 50 per cent or less of those with CCC or lower do so.

The proportion of students who gain a first or upper second in their degree studies has risen since 2004

9. Sixty-three per cent of students taking up a full-time degree in 2007 obtained a first or upper second. The corresponding figure for those who entered in 2004 was 61 per cent.

There is significant variation in degree outcome for students from different ethnicities

10. Students classifying themselves as White consistently achieve higher degree outcomes than students recording other ethnicities. This confirms findings from previous HEFCE studies. In all, 72 per cent of White students who entered higher education with BBB gained a first or upper second. This compares with 56 per cent for Asian students, and 53 per cent for Black students, entering with the same A-level grades.

Female students are more likely to achieve an upper second or higher than male students with the same prior educational attainment

11. For example, of students who enter with A-level grades AAB, 79 per cent of female students go on to gain an upper second or higher, compared to 70 per cent of male students. This difference is because of the proportion achieving upper seconds. The same proportion (20 per cent) of women and men achieve first class honours.

Students from disadvantaged areas tend to do less well in higher education than those with the same prior educational attainment from more advantaged areas

12. We classified the postcodes students live in immediately prior to entry using either the Income Deprivation Affecting Children Index (IDACI), which measures in a local area the proportion of children under the age of 16 who live in low-income households, or Participation of Local Areas (POLAR), which measures in a local area the proportion of young people who go onto higher education. We found that on either measure, those from the most disadvantaged areas have consistently lower HE degree outcomes than those with the same prior educational attainment from other areas.

13. Applying IDACI, 77 per cent of those from the most advantaged areas with ABB at A-level go on to gain a first or upper-second degree. This figure drops to 67 per cent when ABB students from the most disadvantaged areas are considered.

Independent school students enter higher education with better A-level grades than those from state schools

14. The average A-level attainment of students from independent schools is ABB, whereas for those from other schools and colleges it is BBC.

State school students tend to do better in their degree studies than students from independent schools with the same prior educational attainment

15. This difference is less marked in women, those with the highest A-level achievement, and those who study at HEIs with high entry tariffs, but even in these categories it remains statistically significant.

16. This improved performance is not affected by the type of state school. Students from community schools, foundation schools, sixth form colleges and voluntary controlled or aided schools all tend to do better than their independent school counterparts with the same prior educational attainment.

In all levels of A-level achievement, state-schooled entrants to HE tend to do better in their degree studies than independently schooled counterparts with the same prior GCSE attainment

17. This gap in degree success between those from the state sector and those from independent sector widens as students' GCSE attainment falls. The gap is very small in those with the highest GCSEs: 73 per cent of state school students with the equivalent of eight A grades at GCSE go on to gain a first or upper second in their degree studies; this proportion drops to 69 per cent for independent school students (a gap of 4 percentage points) with the same GCSE profile. The difference becomes significantly greater even in those with the equivalent of eight B grades at GCSE: 52 per cent of state school students gain a first or upper second, compared with 43 per cent of independent school students (a gap of 9 percentage points).

Students who have remained in the state school sector for the whole of their secondary school education tend to do better in their degree studies than those with the same prior educational attainment who attended an independent school for all or part of their secondary education

18. A small proportion (3 per cent) of the degree entrants investigated studied for their GCSEs at an independent school and then moved to a state school for their A-levels. In this group, 53 per cent of those who gained BCC at A-level obtained a first or upper second in their degree studies. This compares with a figure of 58 per cent of the students who gained BCC wholly in the state sector.

There is a relationship between a student's level of attainment at A-level relative to the average of the school and his or her potential for success at degree level

19. When students with the same prior educational attainment are considered, those with A-level grades that are better than the average for their school tend to attain more highly in higher education than similar students with grades that are lower than the average for their school. On

average, an entrant who gains BBB at a school where the average A-level attainment is CCC will do better in higher education than an entrant who gains BBB at a school where the average attainment is AAA.

Degree outcomes are not affected by the average performance of the school that a student attended

20. Specifically, a student from a low-performing school is not more likely to gain a higher degree classification than a student with the same prior educational attainment from a high-performing school.

21. For example, regardless of 'school type', a student gaining AAB from a school in the highest 20 per cent of schools in the country has the same likelihood of gaining a first or upper second as a student gaining AAB from a school in the lowest 20 per cent of schools in the country. In both cases, the proportion gaining a first or upper second is 79 per cent.

Introduction

22. Prior educational attainment is the main criterion used by higher education institutions (HEIs) to decide whether to make offers to or accept applicants. However, HEIs, further education colleges (FECs) and other higher education (HE) providers also examine contextual data. Their aim is to set attainment against the background of the circumstances in which it is achieved. Information of this kind can be used to identify applicants with relative educational disadvantage, and it may be possible to make lower offers to such applicants on the basis that their potential is greater than their grades indicate. Specifically, a number of institutions consider what the average A-level achievement is at an applicant's school ('school performance'), and whether the school is in the state or independent sector ('school type').

23. In 2003 and 2005 HEFCE published statistical studies examining whether 'school performance' and 'school type' can safely be used to identify applicants with educational disadvantage and hence greater HE potential than their grades suggest. These studies found that students with similar prior attainment from independent schools do consistently less well at the end of their degree studies than students from other schools and colleges. This updated analysis confirms our earlier finding.

24. The 2004 Admissions to Higher Education Review, referred to as the 'Schwartz Review', became a driver for higher education providers to develop their admissions policies and practices according to agreed principles of fair admissions, while recognising the autonomy of providers and their legitimate aim to recruit the most able students, taking account of past attainment and future potential[1]. The review urged providers to look at 'the background and context of applicants' achievements', including 'hard' quantifiable measures and qualitative judgements.

25. Following a recommendation in the Schwartz Report, the Supporting Professionalism in Admissions (SPA) programme was established in 2006 to provide a central source of expertise, evidence-based good practice and advice to support higher education providers in delivering fair and professional admissions. In October 2013, SPA published a report bringing together the evidence base so far for the use of contextual information and data in admissions of students to undergraduate courses. By considering a number of sources (including in-house analysis at HEIs, academic studies, national research, and the HEFCE reports referenced above), they made a number of recommendations including that 'funding councils should undertake a long-term comparative study of the performance of disadvantaged students compared to those with no disadvantage using higher education and/or administrative datasets'[2].

26. In this report we update the work published in 2003 and 2005. The previous HEFCE work focused on students who entered full-time first degree courses in 1997-98, and looked at their HE achievements up to August 2002. Here we examine the outcomes of the cohort of students who entered in 2007-08 (and earlier cohorts), and their HE achievements up to 31 July 2011. This entire cohort approach allows us to analyse the outcomes of over 130,000 students,

[1] 'Fair admissions to higher education: recommendations for good practice', Schwartz, September 2004. www.admissions-review.org.uk/ (accessed January 2014).

[2] 'Contextualised admissions: Examining the evidence', ARC Network Ltd, Report to SPA, the Supporting Professionalism in Admissions Programme, October 2013, p57. www.spa.ac.uk/information/contextualdata/spasworkoncontextual/cdresearch2013/ (accessed January 2014).

eliminating the impact of biases caused by sampling, and to robustly examine effects that smaller non sector-wide studies are unable to explore.

27. We have extended our analysis to consider other issues by including factors that were not explored in these previous studies. These include ethnicity, gender, additional schooling effects, GCSE attainment and postcode-based measures of disadvantage.

Outline of discussion

Cohort analysed

28. The population examined in this report is restricted to 18 and 19 year-old entrants domiciled in England to full-time first degree courses. Approximately 80 per cent of these entrants hold three or more A-levels, and we have limited the analysis to these students to ensure that we have comparable measures and can be confident that we are making like-for-like comparisons.

29. The population is further restricted to entrants whose first degree study is:

- at a UK HEI
- full-time
- expected to last no more than four years
- not in medicine or dentistry
- an honours programme (expected to generate an award with a classification).

30. Entrants to academic year 2007-08 are the latest and most up-to-date cohort we have examined, as sufficient time has not yet elapsed to assess the HE achievements of later cohorts. For example, although we have information about entrants in 2010-11, we would need HE outcome information from 2013-14 (the academic year that ends in July 2014) to fully assess the success of these students. For the majority of the report, we focus on the 2007-08 entrant cohort, the latest cohort that we have assessed.

31. In 2007-08, there were 197,000 UK young entrants to full-time first degree programmes at UK HEIs. After the exclusions given above, the main cohort for analysis (2007-08 entrants) becomes 132,000. For further information on exclusions, and sizes for earlier cohorts, see Annex A.

32. We use two principal sources of data for this analysis: the Higher Education Student Record and the Department for Education's National Pupil Database, which are linked together via fuzzy matching[3]. In addition, we enhance and improve the information derived from these linked data using UCAS's administrative records for the appropriate years[4].

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[3] For further information, see www.hesa.ac.uk/index.php?option=com_studrec&Itemid=232&mnl=13051 and www.adls.ac.uk/department-for-education/dcsf-npd/?detail (accessed January 2014).

[4] See UCAS web-site for further information: www.ucas.com/

Measures of achievement

A-level achievement

33. In the original 2003 and 2005 studies, the measure of prior educational attainment used was a summary of A-level results. Due to improvements in data quality, we are now able to make use of the precise A-level grades achieved and, where appropriate, the subject of the A-level.

34. For the purposes of analysis, an entrant's A-level achievement is categorised using their best three A-level grades, except for the highest achieving where any additional A-levels (in addition to the best three) are also considered. Therefore the following groups are used.

a. Students who have at least four A grades at A-level (labelled AAAA+).

b. Students who have at least three A grades at A-level, and have, in addition, at least one more B to E grade at A-level but no more additional A grades (AAA+1);

c. Students who have exactly three A grades at A-level, and no additional A-level grades (AAA only);

d. Students whose best three grades at A-level are given in the bullet points below. Grade combinations that appear on the same bullet are grouped together and labelled using the first grade combination (in bold). Note that other A-level categorisations have been considered (such as separate groups for those holding CCD compared with ADE), and the main conclusions given in this report are unchanged when these are used.

i. **AAA**

ii. **AAB**

iii. **ABB** AAC

iv. **BBB** AAD ABC

v. **BBC** AAE ABD ACC

vi. **BCC** ABE ACD BBD

vii. **CCD** ADE BCE BDD

viii. **CDD** AEE BDE CCE

ix. **DDD** BEE CDE

x. **DDE** CEE

xi. **DEE**

xii. **EEE**

HE achievement

35. A number of potential measures of HE student success could be examined but for the purposes of this report, we focus on measures relating to the degree classifications gained by cohorts of entrants. Other measures of wider student success could also be considered (such as employment or further study outcomes). These are not examined here, but HEFCE has recently

published ‘Higher education and beyond: Outcomes from full-time first degree study’ which focused on these wider success measures[5].

Definition of schooling effects

36. As with the previous HEFCE studies in this area, parts of this report examine the effects of school characteristics on achievement in higher education. These effects are defined as the expected difference in higher education achievement between students from relatively disadvantaged schools, compared with students with the same characteristics apart from their schools, which are relatively advantaged. ‘Relatively disadvantaged’ is interpreted in a number of ways but in particular can mean whether the school is ‘low-performing’ or of a particular type (such as coming from the maintained sector compared with the independent sector). If students from disadvantaged schools outperform those from advantaged schools, then in this report the school effect is said to be positive. Otherwise the effect is neutral or negative.

Structure of the document

37. The discussion is set out as follows.

a. Relationship between A-level and HE achievement.

b. School based effects examined through simple summaries by breaking down the cohort into different A-level achievement categories.

c. Non-school based effects examined through simple summaries.

d. School and non-school based effects examined though combined modelling.

e. Testing schooling effects conclusions from modelling.

f. Variation in schooling effects for different sub-groups of students.

g. Summary.

38. We first show, through simple univariate summaries, the apparent effects on HE achievement of individual A-level grades (a above), school performance, type and other school-related factors (b), and other non-school related factors (c). We then look at the school-based factors more carefully, taking into account a range of other factors, by employing modelling techniques (d).

39. We then describe how we have carried out additional analyses to test the robustness of our main analysis on school factors (e), and how these schooling factors take effect at different groups of institutions, depending on their selectivity, and within different subject areas (f).

Relationship between A-level and HE achievement

2007-08 entrants

40. Figure 1 shows the relationship between A-level and HE achievement (within four years) for the cohort of first degree entrants in 2007-08. The figure shows two measures of HE achievement:

- proportion of 2007-08 entrants who gained an upper second or better by July 2011

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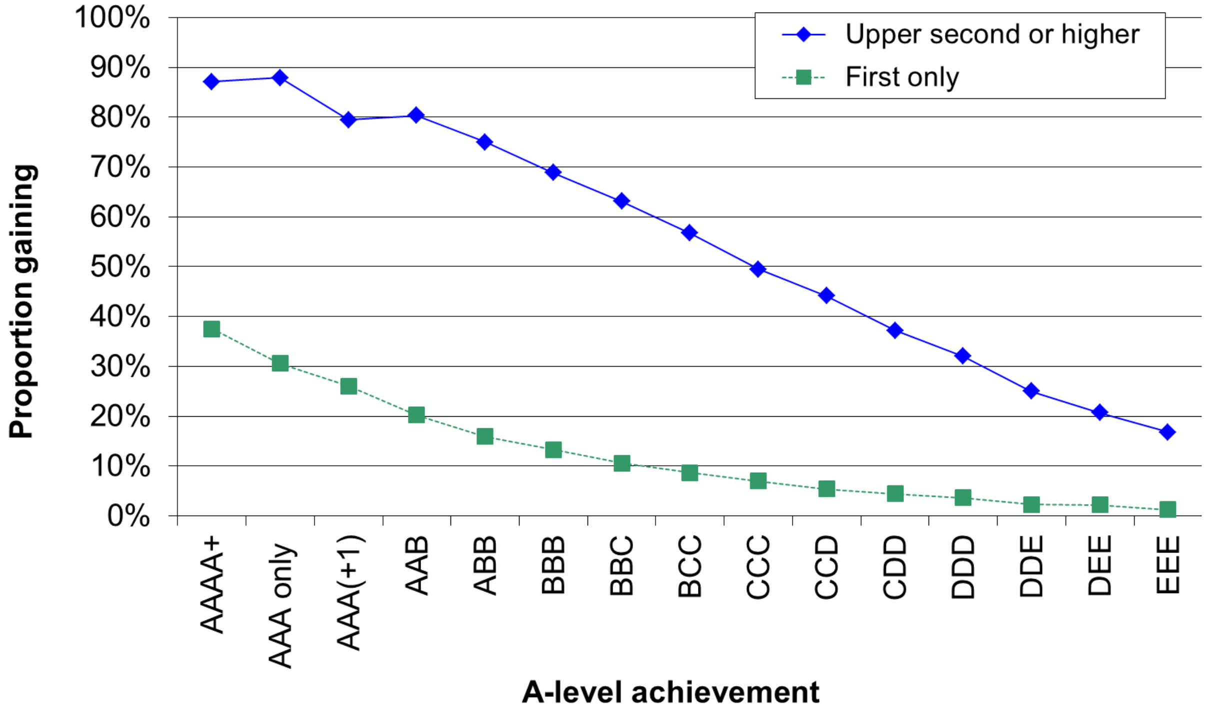
[5] ‘Higher education and beyond: Outcomes from full-time first degree study’ (HEFCE 2013/15), www.hefce.ac.uk/pubs/year/2013/201315/

- proportion of 2007-08 entrants who gained a first by July 2011.

41. For both measures, entrants who transfer between HEIs but still gain either an upper second or first class honours are included. In addition, as the entire cohort of entrants is tracked, those who do not complete their degree studies (either due to non-continuation or their study time is beyond the four years) are included in the population who have not gained the relevant high degree classification.

Figure 1 Relationship between A-level and HE achievement for 2007-08 entrants to degree courses



Note: A-level groups ABB to DDE contain all equivalent combinations of three A-levels that equate to the listed combinations. Although 'AAA(+1)' notionally represents higher A-level achievement than 'AAA only', the order of these two A-level achievements has been switched to reflect the relationship with HE achievement.

42. Figure 1 shows that there is a clear relationship between A-level achievement and the two HE measures of achievement examined. When looking at the proportions gaining an upper second or higher, the relationship is linear apart from those with very high A-level achievement where the relationship levels off.

Earlier cohorts (entrants between 2004-05 and 2007-08)

43. Table 1 shows how these two measures vary when earlier entering cohorts are considered. For each cohort, only a four-year assessment period applies. Therefore for the 2004-05 cohort, the proportions are based on entrants who gained a first (or upper second) by July 2008.

Table 1 HE achievement for different cohorts of entrants

Degree outcome (within four years)	2004	2005	2006	2007
First	11.8%	12.6%	13.4%	13.9%
Upper second or higher	60.7%	61.4%	62.2%	63.0%

Extending the time assessed for HE achievement

44. In order to examine the most recent entrants possible, we have limited the cohort for our analysis to entrants on degree courses expected to last no more than four years (and more typically three years). This means that we can restrict the amount of time we leave to assess students' HE achievements to four years.

45. However, it is possible to use earlier entrant cohorts to assess the effect of extending the period we allow for assessment to five or more years (while retaining the restriction that the entrants are on degree courses expected to last no more than four years)[6].

46. Table 2 shows the proportion of 2004-05 entrants who gained an upper second or better (and the corresponding proportion who gained a first) by July 2008, July 2009, July 2010 and July 2011[7].

Table 2 HE achievement at different time points for the 2004-05 entrants to degree courses

HE achievement of entrants in 2004-05	By July 2008	By July 2009	By July 2010	By July 2011
First only	11.8%	12.4%	12.5%	12.7%
Upper second or higher	60.7%	62.7%	63.3%	63.6%

47. Table 2 shows that the majority of those entrants who are to gain a high classification degree do so within four years. The main analysis presented in this report is based on HE achievement within four years. The main findings from this report are unchanged if extended time periods for outcomes are considered.

Effects examined through simple summaries

48. SPA's 2013 contextual data report identified four broad data types that are used in contextual admissions:

- school- or college-focused – such as type of establishment, or performance at particular levels
- area- or community-focused – Socio-economic or area-based deprivation indicators or measures of participation in higher education

[6] Although only entrants to full-time degree courses are included in the cohort, students may switch to part-time education during their studies, or transfer to a different course or institution.
[7] The trend is similar when the 2005-06 and 2006-07 cohorts are examined.

- individually focused – factors particular to the individual
- outreach-focused – such as attendance on a targeted widening participation activity.

49. In this section, we initially examine some of the measures relating to the first of these: school- or college-focused measures. We then go on to explore some alternative area-, community- or individually focused measures. We do not explore outreach focused measures in this report.

School- or college-focused measures

School performance

50. To order the schools attended by the pupils in our cohort, we have used the Average Level 3 Points Score per entry (APS) as used in the School and College Performance Tables at Key Stage 5[8]. Each school is placed in one of five quintiles (from the highest 20 per cent through to the lowest 20 per cent) based on its APS rank, weighted by Key Stage 5 pupil numbers at schools. Thus quintile 5 (Q5) represents the schools with the highest average Key Stage 5 results, and quintile 1 (Q1) represents the schools with the lowest average Key Stage 5 results.

51. Table 3 shows the school performance quintile for the 2007-08 entrant cohort is skewed towards those from higher performing schools with over 40,000 of the entrants coming from quintile 5 schools and around 10,000 coming from quintile 1 schools.

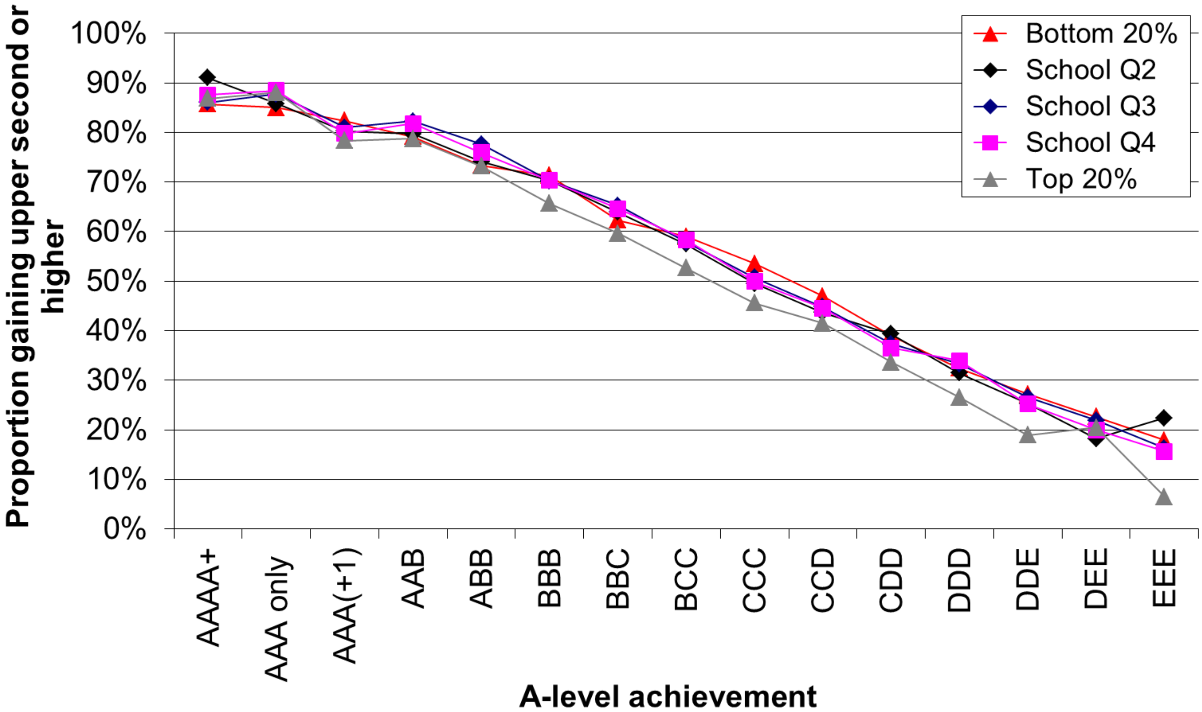
Table 3 Distribution of 2007-08 HE entrants by school performance quintile

School performance quintile	N 2007 entrants
Quintile 1	9,610
Quintile 2	17,330
Quintile 3	29,300
Quintile 4	34,390
Quintile 5	41,495

52. Figure 2 plots the proportion of the cohort gaining an upper second or higher by the student's A-level points and the five school performance quintiles.

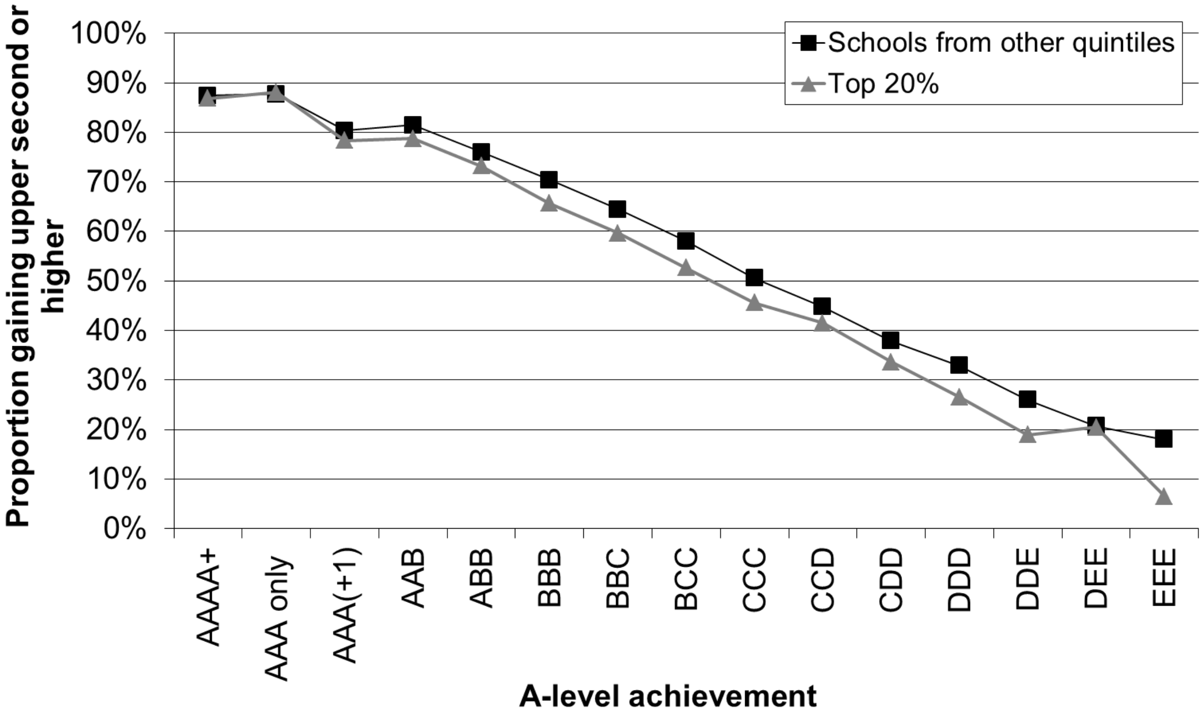
[8] As defined in www.education.gov.uk/schools/performance/secondary_11/PointsScoreAllocation2011.pdf (accessed January 2014), and found here: www.education.gov.uk/schools/performance/ (accessed January 2014).

Figure 2 HE performance and school performance



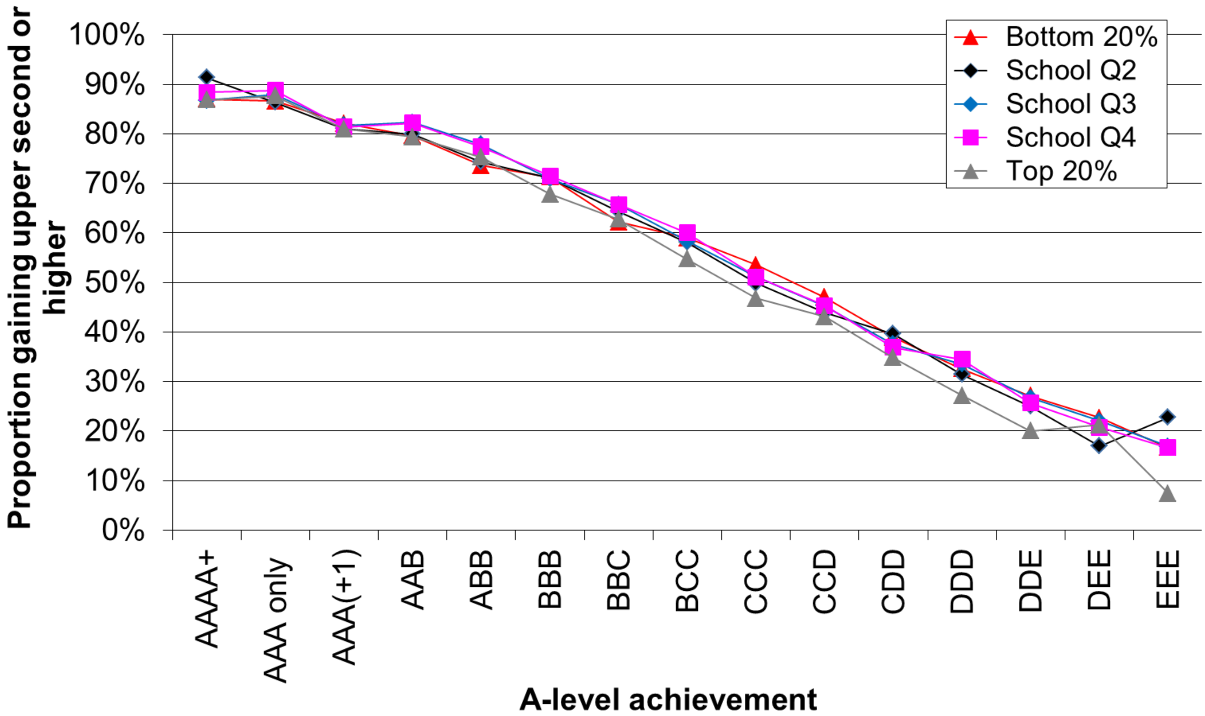
53. Figure 2 shows a strong association between A-level and HE achievement for each of the school performance quintiles. It is difficult to separate the HE performance of students from the lower four school quintiles. However the students from the highest-performing schools (Q5, the top 20 per cent) have lower HE achievement than other students with the same A-level achievement, except for students with very high A-level achievement (at least three A grades at A-level). Note that the relationship becomes less stable at the lowest A-level achievement levels (such as those achieving DEE or EEE at the top 20 per cent of schools) due to small numbers in those groups. To aid interpretation, Figure 3 shows the equivalent for Figure 2 but with students from schools in the lowest four quintiles (Q1 to Q4) grouped together.

Figure 3 HE performance and the highest-performing schools



54. To help us understand further the relationship between HE achievement and school performance, Figure 2 is recreated for state-schooled students only at Figure 4.

Figure 4 HE performance and school performance (state schools only)



55. The relationship between HE achievement and school performance quintile is similar regardless of whether independently schooled students are included in the comparison or not. Figure 4 shows a similar trend to Figure 2, but with a slightly less marked difference between schools in the top 20 per cent and other quintiles.

School type

56. Table 4 shows which Key Stage 5 school types the 2007-08 entrant cohorts attended.

Table 4 Schools grouped by type

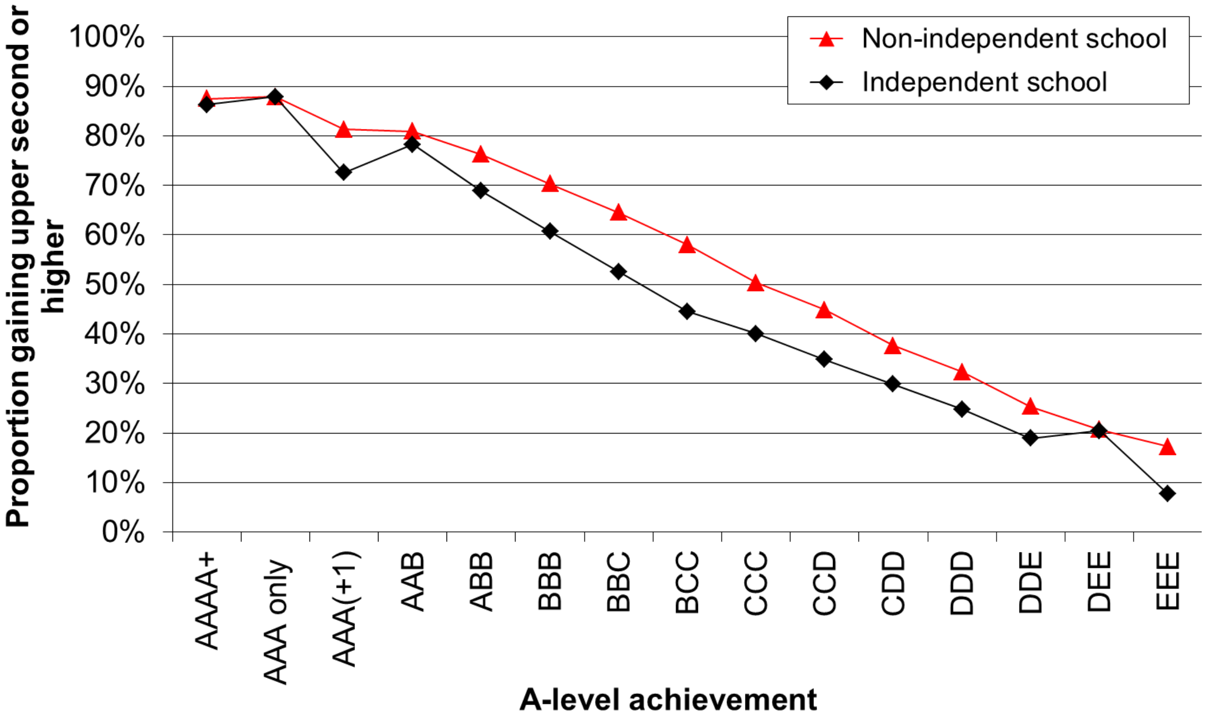
School type	School performance range (median in parentheses)	Number of HE entrants	Median A-level tariff of HE entrants	Proportion of cohort gaining an honours degree gaining an upper second or better
Voluntary Aided/Controlled School	337 (793) 1180	20,060	280	62.9%
Foundation School	254 (796) 1326	27,005	280	64.8%
Sixth form / further education colleges	362 (745) 1067	37,045	280	58.8%
Community School	254 (735) 1109	28,125	280	64.0%
Independent	345 (911) 1228	19,890	320	67.0%
All schools and FECs	254 (791) 1326	132,125	280	63.0%

Note: School performance range calculated using APS as described in paragraph 50. A-level tariff of HE entrants calculated using capped UCAS tariff based on summing the points associated with the best three A-levels.

57. Table 4 shows that the majority of the 2007-08 entrants attended non-independent Key Stage 5 schools with the largest group coming from sixth form or further education colleges. The table also shows that, at an aggregated level, those from independent school have both the highest A-level tariff achievement and proportions gaining an upper second or higher in their degree studies.

58. Figure 5 shows the proportion of the cohort who gain an upper second or higher by the student’s A-level achievement and their broad type of Key Stage 5 (KS5) school (state – first four school types in Table 4 or independent).

Figure 5 HE achievement and broad school type

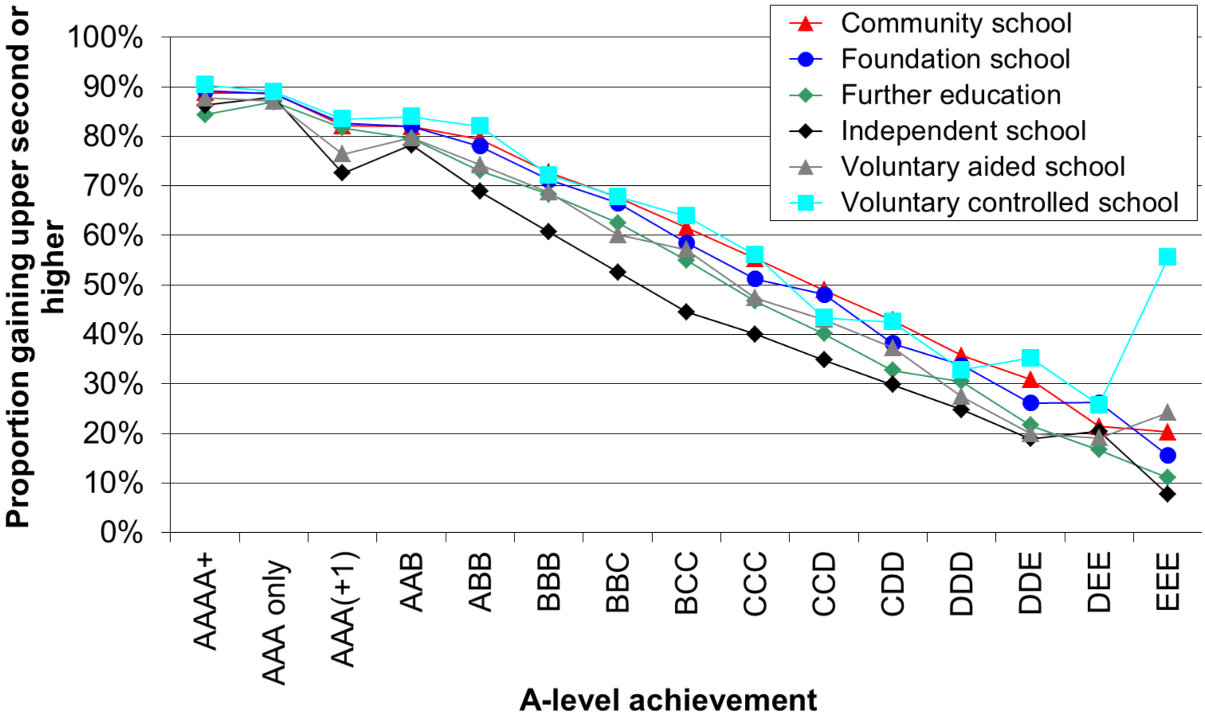


59. Figure 5 shows, for all but those with the very highest A-level achievement, a clear separation in HE achievement between those who entered HE from an independent KS5 school and those entering from a state school.

60. Note that for the lowest A-level achievement groups (DEE and EEE), there are very few independent schooled entrants and hence the relationship is less stable. This should also be noted for subsequent figures.

61. Figure 6 repeats Figure 5 but separates out state schools into finer types.

Figure 6 HE achievement and state school type



62. Figure 6 shows that those students whose KS5 school is independent have the lowest HE achievement, except among students with the highest possible A-level achievement. For those who attended state school, there are some variations in HE achievement depending on the particular type of school, but the patterns are not marked and vary depending on A-level achievement.

63. Figure 7 repeats Figure 5 but separates out independent schools into finer groups using the umbrella organisation they are associated with[9]. For schools that are associated with more than one organisation, the order in which we consider these organisations is given below:

- Girls School Association (GSA)[10]
- The Headmaster's and Headmistresses' Conference (HMC)[11]
- Society of Heads (SOH)[12]
- other or no affiliation.

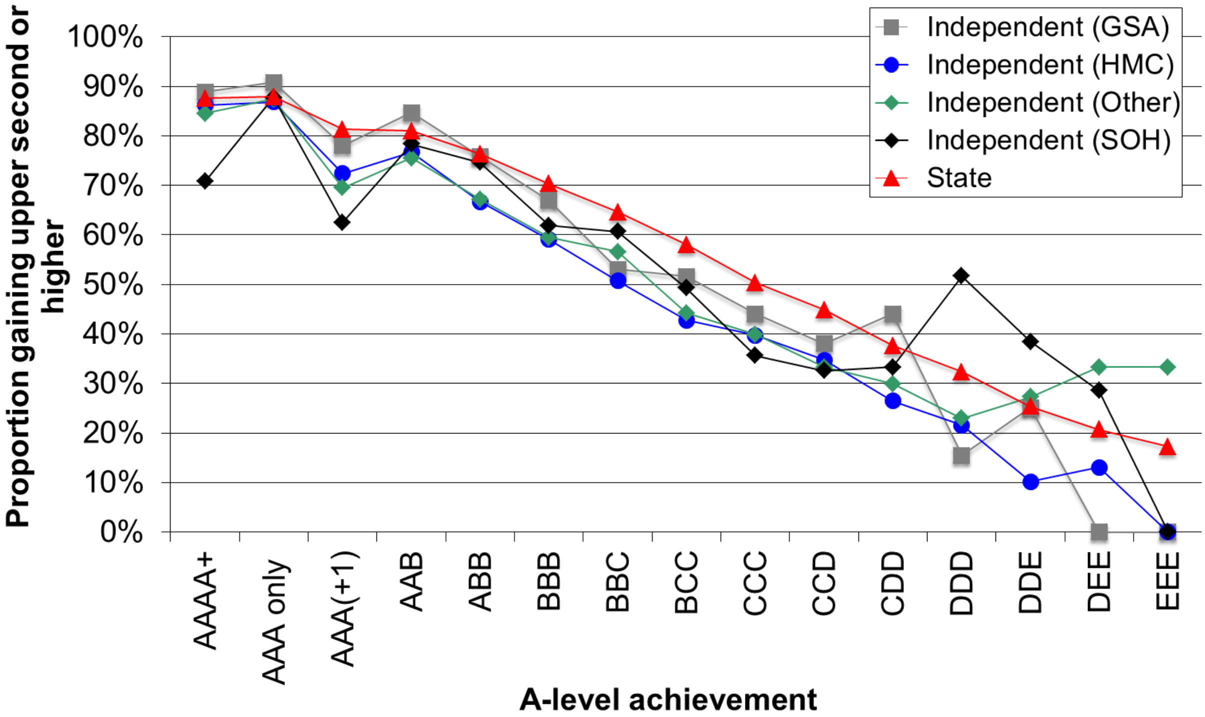
[9] Association on 31 October 2013.

[10] For further details, see www.gsa.uk.com/ (accessed January 2014).

[11] For further details, see www.hmc.org.uk/ (accessed January 2014).

[12] For further details, see www.thesocietyofheads.org.uk/ (accessed January 2014).

Figure 7 HE achievement and independent school type



64. Figure 7 shows that those students whose KS5 school was a state school have, in general, the highest HE achievement when-independent schooled students are separated into different groups depending on the affiliation of their independent school. For those who attended independent school, there are some variations in HE achievement, with those whose school is affiliated to the Girls School Association[13] having, in general, the highest HE achievement after accounting for A-level achievement.

Selectivity of school

65. It is plausible that the difference between the HE achievement of state and independent school pupils is driven by the selectivity of the school[14]. To explore this further, we examine the relative HE achievements of students based on whether they attended state or independent school, and whether the school had a selective admissions policy. Table 5 shows that the large majority of independently schooled students came from a school with a selective admissions approach, with only around 1,000 students coming from a non-selective independent school. In the state sector, the majority (87 per cent) come from non-selective schools.

[13] We have also examined the relationship between A-level achievement and whether an independent school was mixed, all girls or all boys. Entrants from three groups of independent schools perform less well than their state school counterparts, with entrants from all-boy independent schools having the lowest level of HE achievement, and entrants from all-girl independent schools having the highest level of HE achievement within the independent schooled entrants.

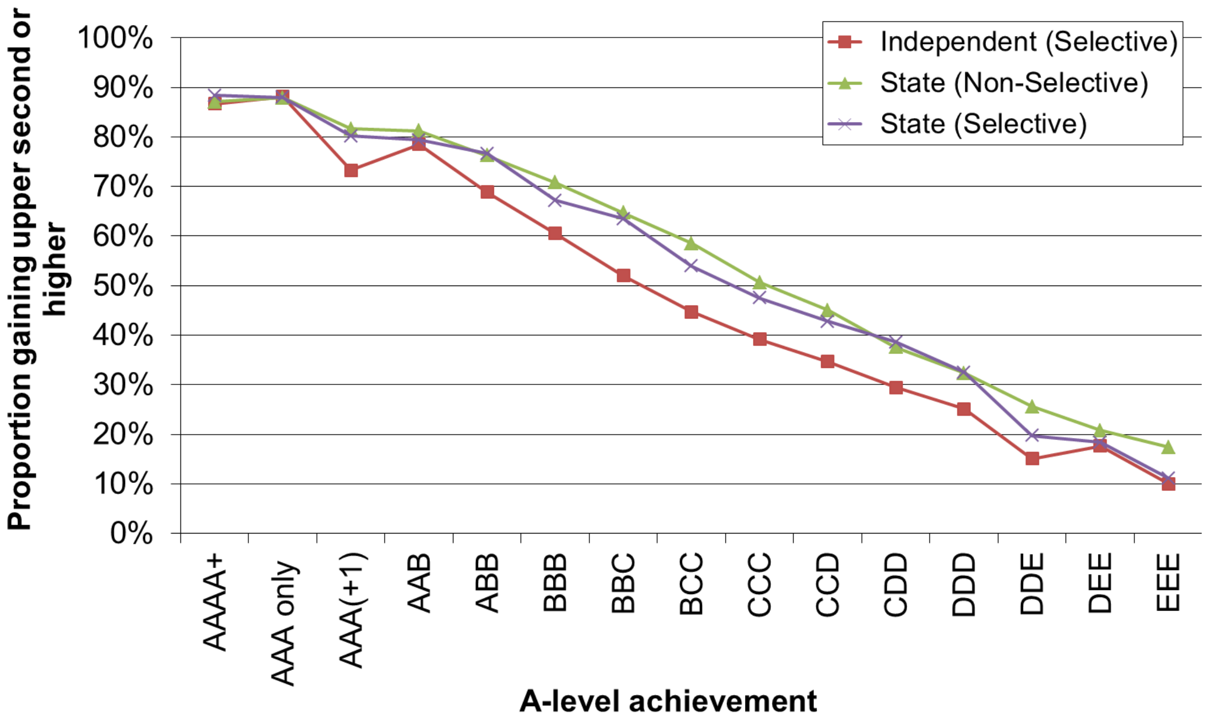
[14] State schools with a selective admissions policy are commonly described as grammar schools.

Table 5 Profile of selectivity of school for 2007 entrant cohort

School type	Selectivity	N
	Non-selective	1,050
Independent	Selective	18,840
	Non-selective	97,515
State	Selective	14,720
Total		**132,125**

66. Figure 8 shows the HE achievement of the cohort split by whether they attended a state or independent school, and whether that school had a selective admissions policy. Due to small numbers (as noted in Table 5), we do not report on entrants from non-selective independent schools[15].

Figure 8 HE achievement by broad school type and school selectivity



67. Figure 8 shows that selectivity has an additional effect in addition to the state versus independent school effect, but that that effect is small. For the state sector, those who attended a selective school have a slightly lower HE achievement for some A-level achievement profiles (mainly those students achieving A-level grades between ABB and CCD).

Facilitating subjects

68. In these simple summaries, the HE achievement of students has been examined with their A-level achievement accounted for (splitting results by A-level achievement). However the

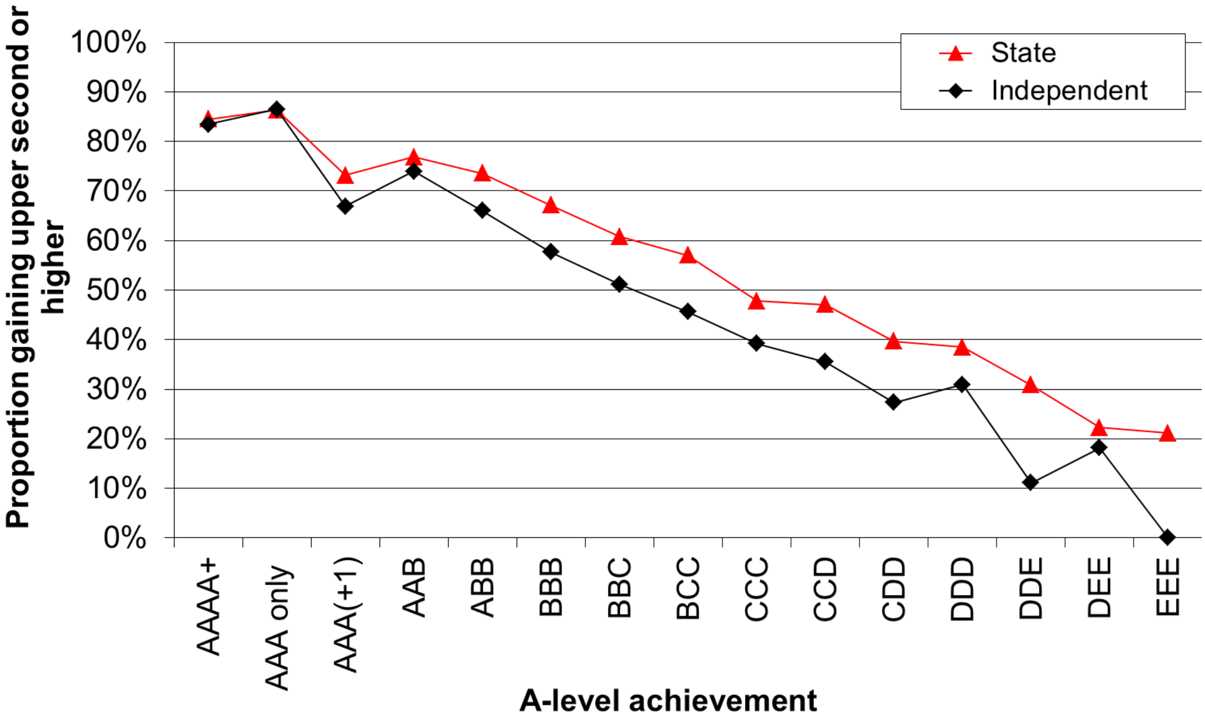
[15] If this line was plotted in Figure 7, it would broadly follow the independent (selective) line.

subject profile of the A-levels is not taken into account in these simple summaries, and these may help contribute to the raw differences seen in the HE achievement of state and independently schooled students once A-level achievement is taken into account.

69. To explore this further, the A-level achievements of 2007-08 cohort were calculated using only A-level qualifications in subjects deemed by the Russell International Excellence Group to ‘open doors to more degrees and more professions than others’. These are sometimes called ‘facilitating subjects’[16]. This change reduces the population who hold three or more applicable A-level qualifications from 132,000 (as given in Annex A) to 30,000.

70. Figure 9 shows the proportion of the cohort who gain an upper second or higher, by the student’s A-level achievement and their type of Key Stage 5 school, but only considering A-level achievements in facilitating subjects.

Figure 9 HE achievement and broad school type (facilitating subjects only)



71. Figure 9 shows a similar relationship between HE, A-level achievement and school type as was seen in Figure 5 when all A-level qualifications were considered: given the same A-level achievement, for all but the highest-achieving students, the proportion gaining a first or upper second is higher for state school students compared with independent school students.

72. This similar relationship implies that the A-level subject differences between state and independent school students do not explain the difference in HE achievement between students with the same A-level achievement.

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[16] For further details, see ‘Informed Choices’ published by the Russell International Excellence Group, www.russellgroup.ac.uk/informed-choices/ (accessed January 2014).

Key Stage 4 school type

73. Much of the work published in this area, including HEFCE's previous publications, examined the relationship between Key Stage 5 school (or the school attended immediately before entry into higher education) and HE achievement. However, using linked Key Stage 4 (KS4), Key Stage 5 and higher education datasets, it is now possible to examine the association between HE achievement and Key Stage 4 or 5 school.

74. Table 6 shows the school type at Key Stages 4 and 5 for the entrants in our cohort.

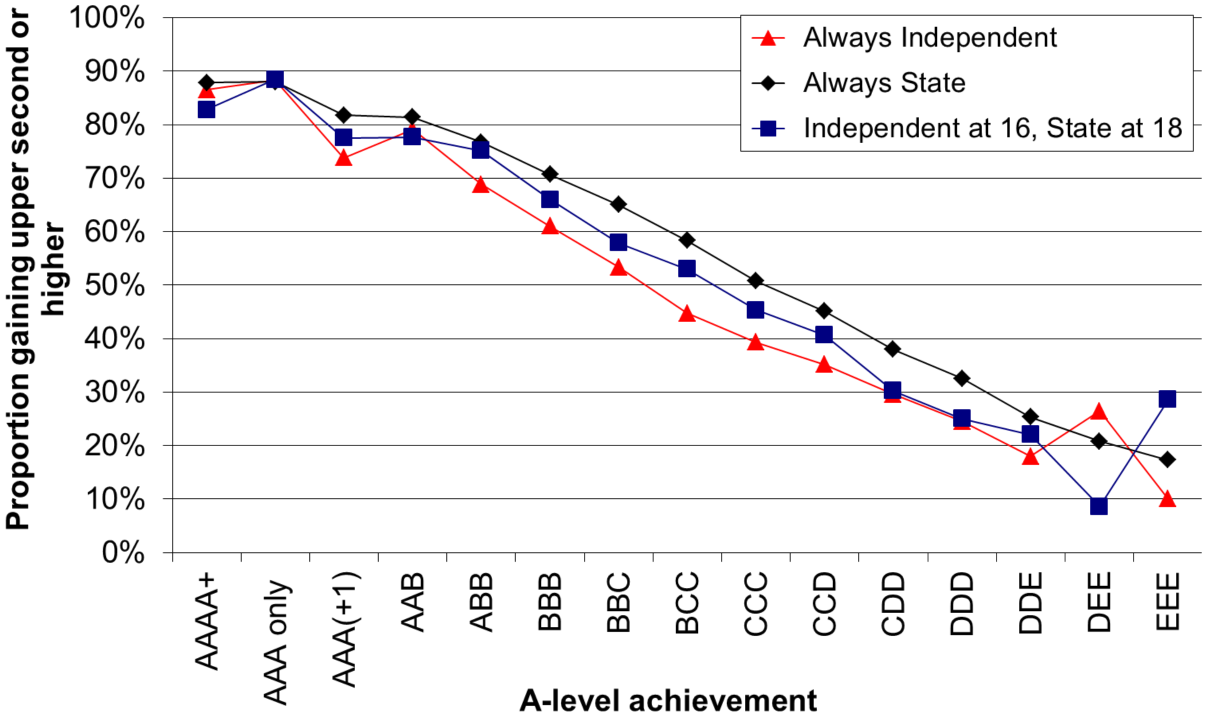
Table 6 Key Stage 4 and Key Stage 5 school type

State	**Number**	**%**
Always Independent	17,190	13%
Always State	105,580	83%
Independent at KS4, State at KS5	3,665	3%
State at KS4, Independent at KS5	990	1%
Undefined	4,700	
Total cohort	**132,125**	

75. Table 6 shows that the large majority of students (83 per cent + 13 per cent = 96 per cent) remained in the same school type sector at Key Stage 4 and Key Stage 5. By contrast, 3 per cent of students transferred from the independent to the state sector between Key Stage 4 and Key Stage 5, and a smaller percentage (1 per cent) transferred the other way.

76. Figure 10 shows the relationship between HE achievement and school type at Key Stages 4 and 5. The proportions for students transferring between state school at Key Stage 4 to independent school at Key Stage 5 are not reported due to the small number of students involved.

Figure 10 HE achievement and school type at Key Stages 4 and 5



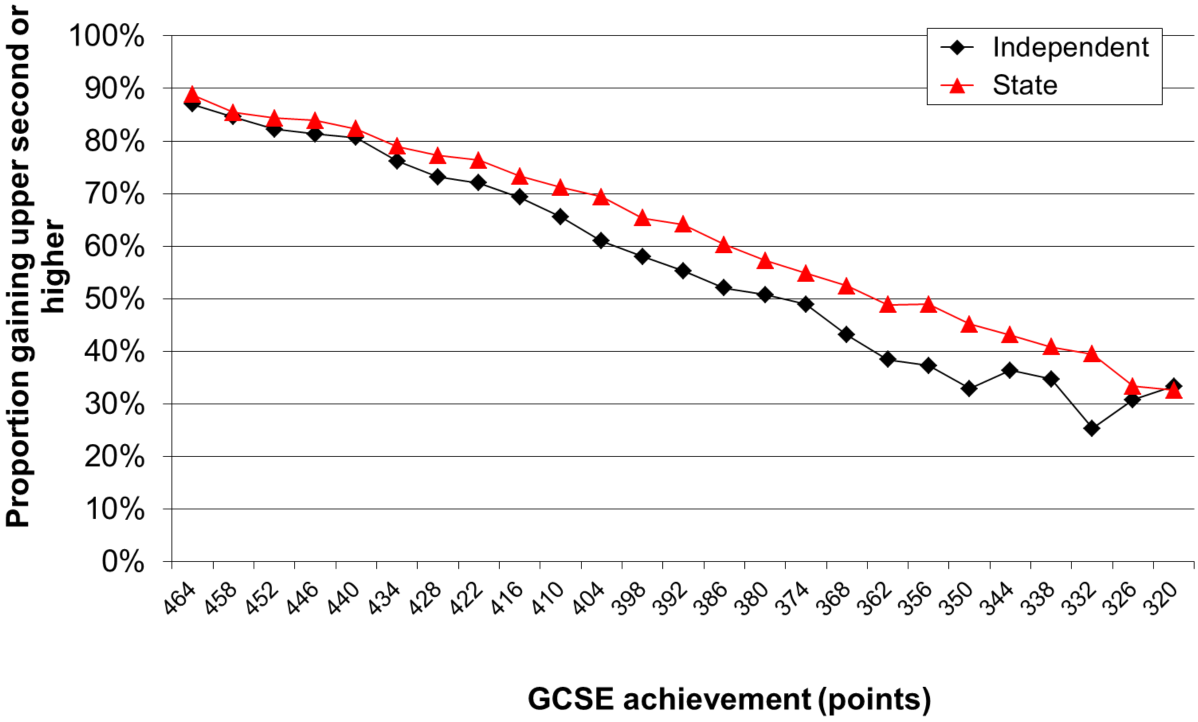
77. Figure 10 shows that, after accounting for A-level achievement, the HE achievement of students who transfer from the independent to the state school sector at Key Stages 4 and 5 lies between those who only attended the state sector, and those who only attended the independent sector.

<u>Using GCSE rather than A-level achievement to segment the cohort</u>

78. The majority of univariate comparisons given in this report are split by A-level achievement. It is however possible to provide similar splits for the GCSE achievement of entrants rather than their A-level profiles.

79. Figure 11 shows the relationship between HE achievement and school type split by GCSE achievement. GCSE achievement is based on the best eight GCSE grades (A* to C only) of the entrants; the population examined is those students of the main 2007-08 entrant population with at least eight GCSEs at grade C or above. Each grade is converted into a points score and totalled, the scores for each grade being as follows: A* 58 points, A 52 points, B 46 points and C 40 pts. Thus 464 points (far left of chart) represents an entrant who achieved eight or more A* grades at GCSE, and 320 points (far right of chart) represents an entrant who achieved eight C grades.

Figure 11 HE achievement and school type split by GCSE achievement



80. Figure 11 shows that the proportion gaining a first or upper second is higher for state school students compared with independent school students. However, the difference in achievement increases further down the GCSE achievement range: for those with the highest GCSE achievement, the difference is very small or zero, but it is around 10 percentage points at lower levels (such as the equivalent of eight B grades at GCSE). Note that the pattern of the relationship starts to break down for the lowest GCSE achievement groups shown in the figure: this is due relatively low number from independent schools in these groups.

Other non-school based factors that could affect HE performance

81. In this report, in addition to examining the relationship between school-based measures and HE achievement split by A-level achievement, we also examine the relationship between non-school based measures and HE achievement split by A-level achievement. As outlined in paragraphs 48 and 49, these fall into two categories: area- or community-focused and individually focused.

82. The area- or community-focused measures examined are as follows:

- broad region of pre-higher education domicile
- low-participation neighbourhoods as measured via Participation of Local Areas (POLAR)
- Income Deprivation Affecting Children Index (IDACI).

83. The individualised focused measures examined are as follows:

- pupil’s rank in school in terms of A-level achievement
- pupil’s position relative to the school average in terms of A-level achievement

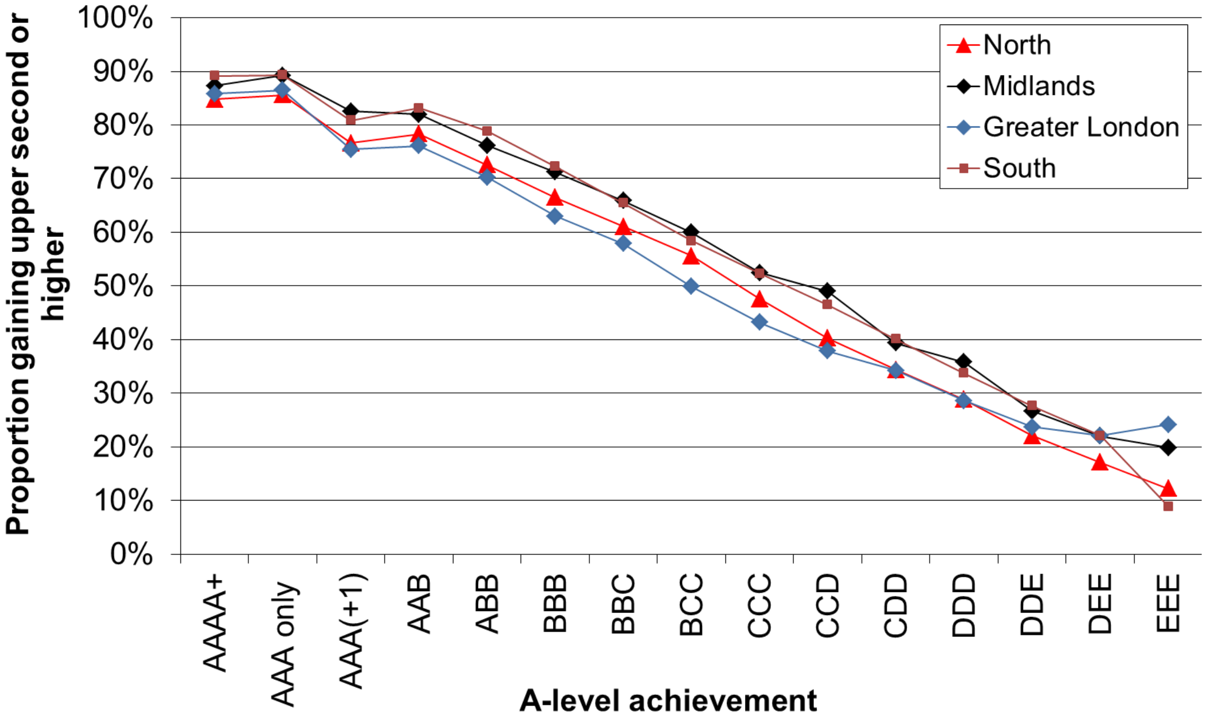
- ethnicity
- gender.

Area- and community-focused measures

Region of domicile

84. Figure 12 shows the proportion of the cohort who gain an upper second or higher, by the student's A-level achievement and the region they were living in immediately prior to entry to higher education.

Figure 12 HE achievement and region of pre-HE domicile



85. Figure 12 shows that, in general, entrants from Greater London and the North have the lowest HE achievement once A-level achievement is taken into account. It is important to note that the distribution of independent schools varies significantly across the English regions, and this variation in distribution may interact with regional effects. In terms of our 2007-08 cohort of entrants, Table 7 shows that 20 per cent of entrants domiciled in Greater London prior to entry came from the independent school sector. This figure drops to only 10 per cent of entrants domiciled in the North.

Table 7 Percentage of first degree entrants from the independent school sector split by pre-HE domicile

Domicile	State	Independent	Total	% Independent
North	30,645	3,590	34,240	10%
Midlands	34,135	5,075	39,215	13%
Greater London	18,330	4,620	22,950	20%
South	28,835	6,545	35,375	19%
Unknown	285	60	345	17%
Total	112,200	19,890	132,125	15%

86. The modelling described later in this document finds that the dominating effect on HE achievement is school type rather than a pre-HE domicile effect. That is, the differences in HE achievement from entrants in different regions are explained in part by the variation in the distribution of independent schools, rather than the differences in independently schooled entrants' performance being explain by regional effects.

POLAR

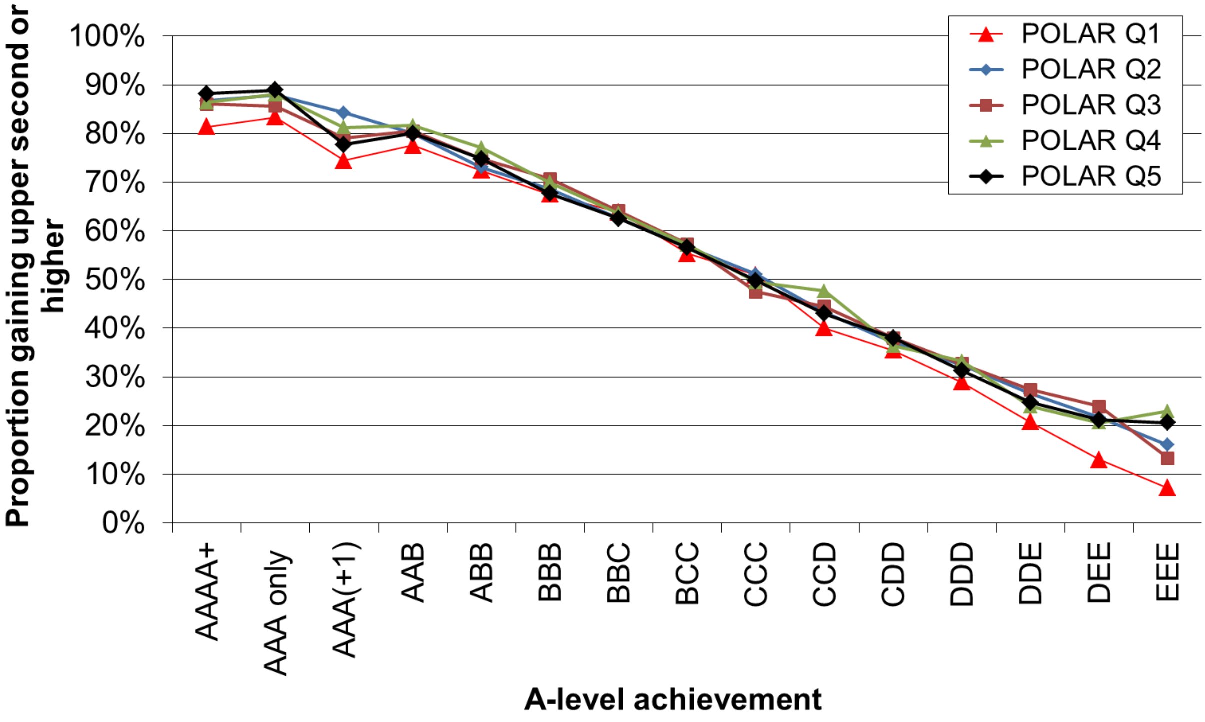
87. Participation of Local Areas is a classification of small areas across the UK, which shows how the chances of young people entering HE vary based on where they live [17]. The classification comprises five quintile groups of areas ordered from '1' (those wards with the lowest participation) to '5' (those wards with the highest participation), each representing 20 per cent of entire UK young cohort.

88. Figure 13 shows the proportion of the cohort who gain an upper second or higher by the student's A-level achievement and the POLAR quintile of the ward they were living in immediately prior to entry to higher education.

89. Figure 13 shows that, once A-level achievement is taken into account, there is little variation in the HE achievements of entrants when all five POLAR quintiles are considered together. However students from areas with the lowest HE participation rates (POLAR quintile 1) have the lowest proportions achieving high classification degrees when student with the highest (AAB and above) and lowest (DDD and below) A-level achievement are examined.

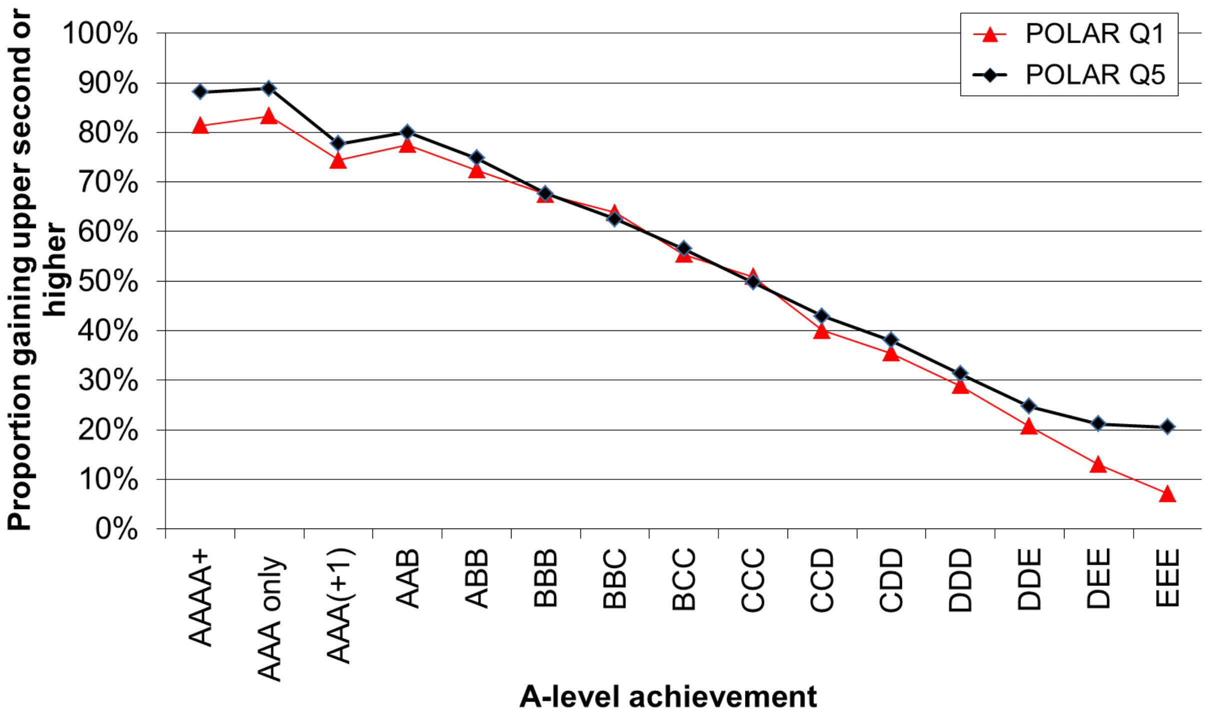
[17] For further details, see www.hefce.ac.uk/whatwedo/wp/ourresearch/polar/

Figure 13 HE achievement and POLAR quintile



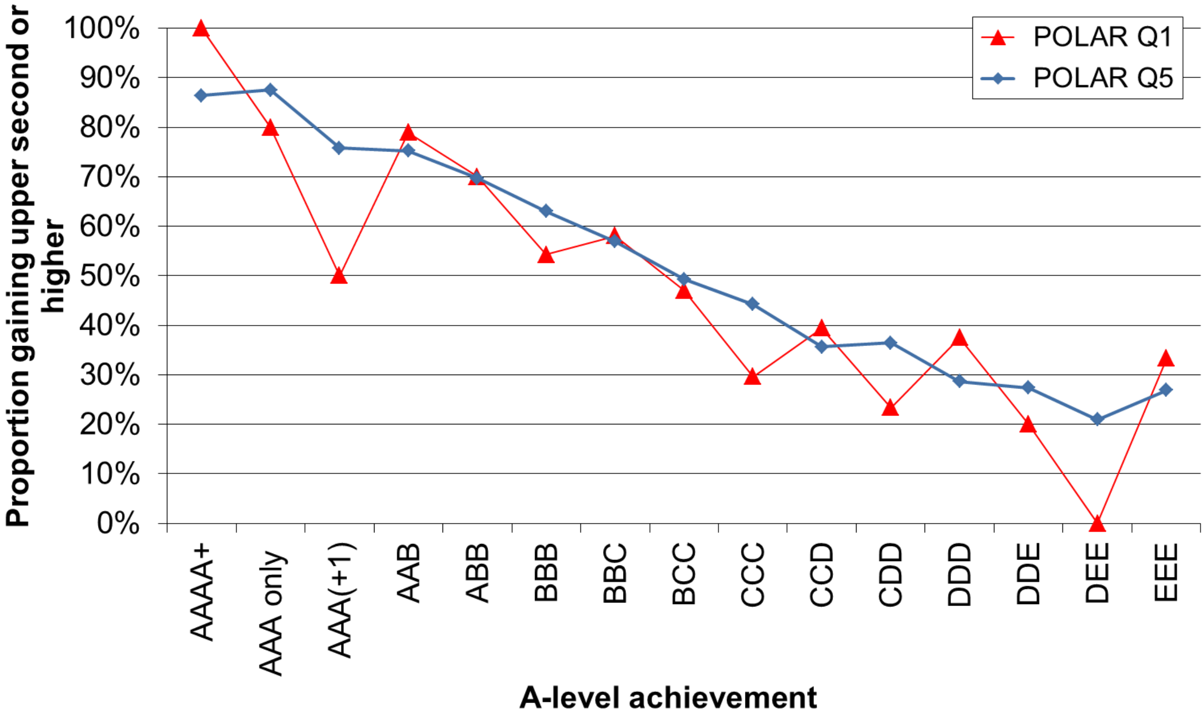
90. For clarity and to examine this further, Figure 14 shows the HE achievements of students from areas with the lowest and highest HE participation rates (POLAR quintiles 1 and 5 respectively). It shows that the relationship between the first degree achievement of these two groups of students varies depending on their A-level achievement.

Figure 14 HE achievement and POLAR quintile 1 or 5



91. Many area-based measures have a different effect when London and non-London domiciles are considered separately. HEFCE's 2013 publication on POLAR notes that the only 3 per cent of the population in London live in areas with the lowest participation rates[18]. To isolate any potential London-based effects on our findings, Figure 15 replicates Figure 14 for those domiciled in London only.

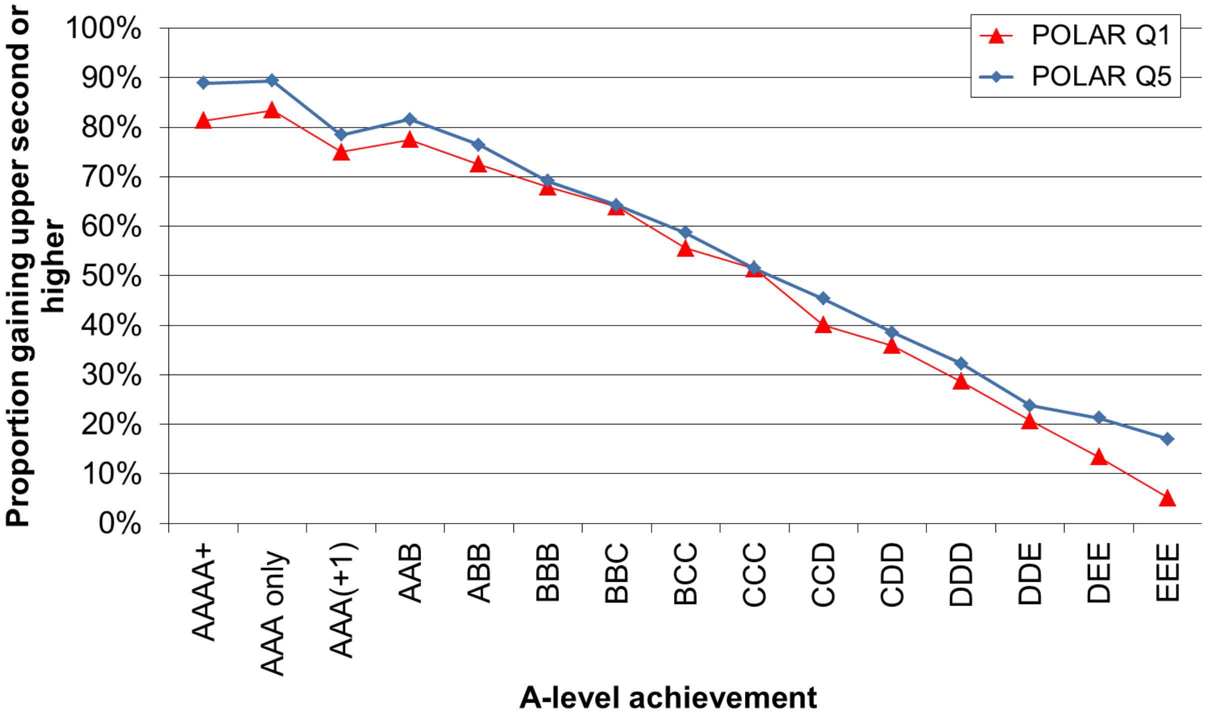
Figure 15 HE achievement and POLAR quintile 1 or 5 (London only)



92. The London focus analysis shows a similar pattern to the global pattern. Due to the small numbers of students in quintile 1 in London, the quintile 1 line has more movement than in the global line. Figure 16 repeats the analysis, but only for those not domiciled in London.

[18] 'Trends in young participation in higher education', HEFCE 2013/28. www.hefce.ac.uk/pubs/year/2013/201328/

Figure 16 HE achievement and POLAR quintile 1or 5 (excluding London)



93. Figures 15 and 16 show that the global patterns noted are unchanged when London and non-London students are considered separately.

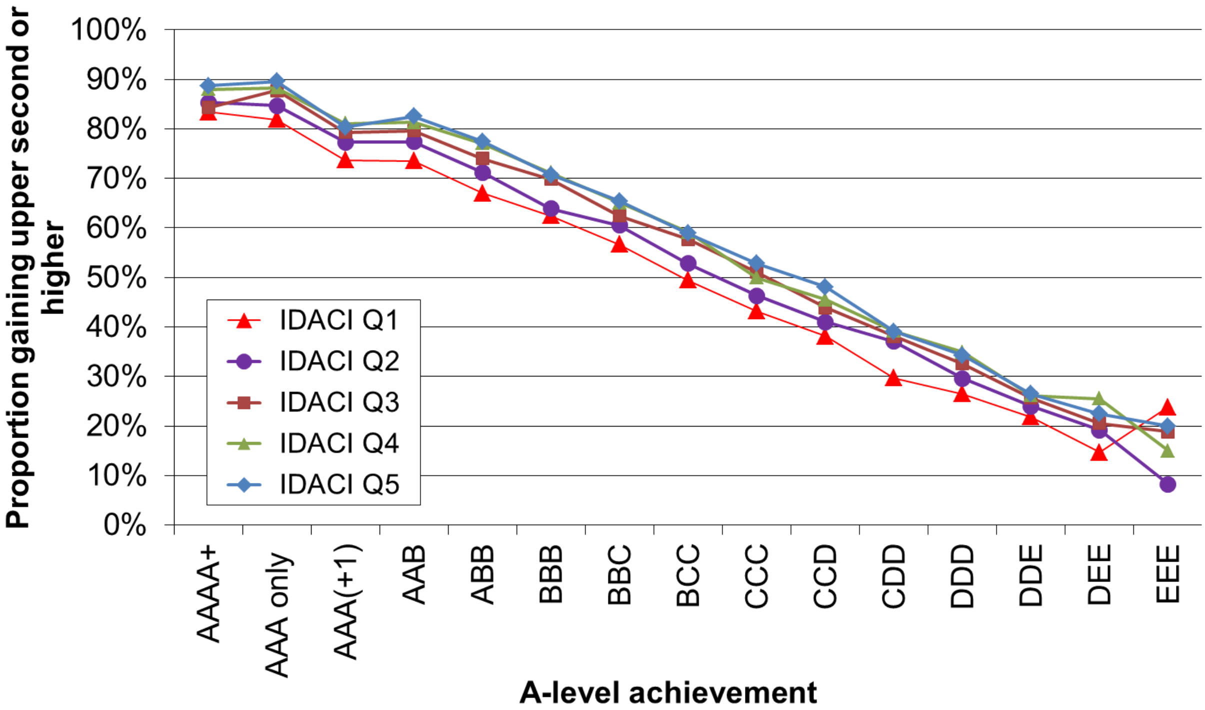
IDACI

94. The Income Deprivation Affecting Children Index is an index of deprivation used in the United Kingdom. The index measures in a local area the proportion of children under the age of 16 who live in low-income households[19]. As with the POLAR categorisation, we have placed individuals into quintiles: IDACI quintile 1 is defined as the areas with the highest proportion of children living in low income households, and therefore the most economically disadvantaged areas; and IDACI quintile 5 represents areas with the lowest proportion of children living in low income households, and therefore the most economically advantaged areas.

95. Figure 17 shows the proportion of the cohort who gain an upper second or higher, by the student's A-level achievement and the IDACI quintile of the ward they were living in immediately prior to entry to higher education.

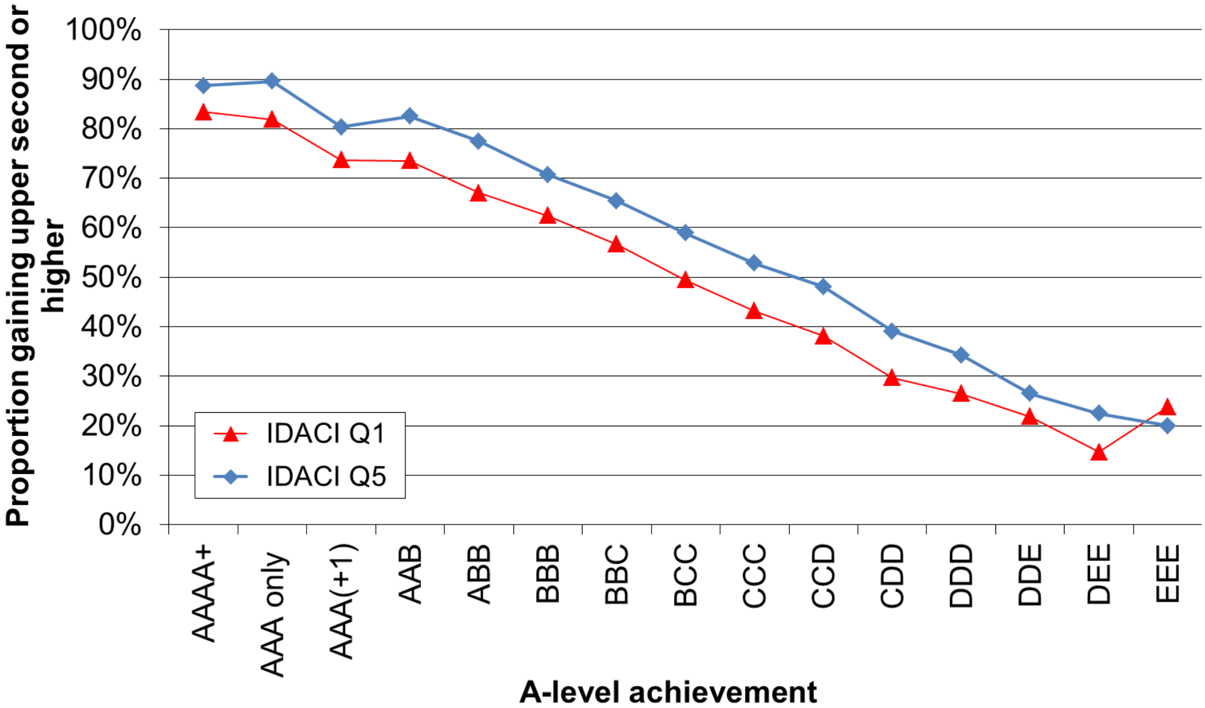
[19] These are defined as: children in Income Support households; children in Income-Based Job Seekers Allowance households; children in Working Families Tax Credit households whose equalised income is below 60 per cent of the median before housing costs; children in Disabled Person's Tax Credit households whose equalised income is below 60 per cent of the median before housing costs; National Asylum Support Service supported asylum seekers in England in receipt of subsistence only and accommodation support.

Figure 17 HE achievement and IDACI quintile



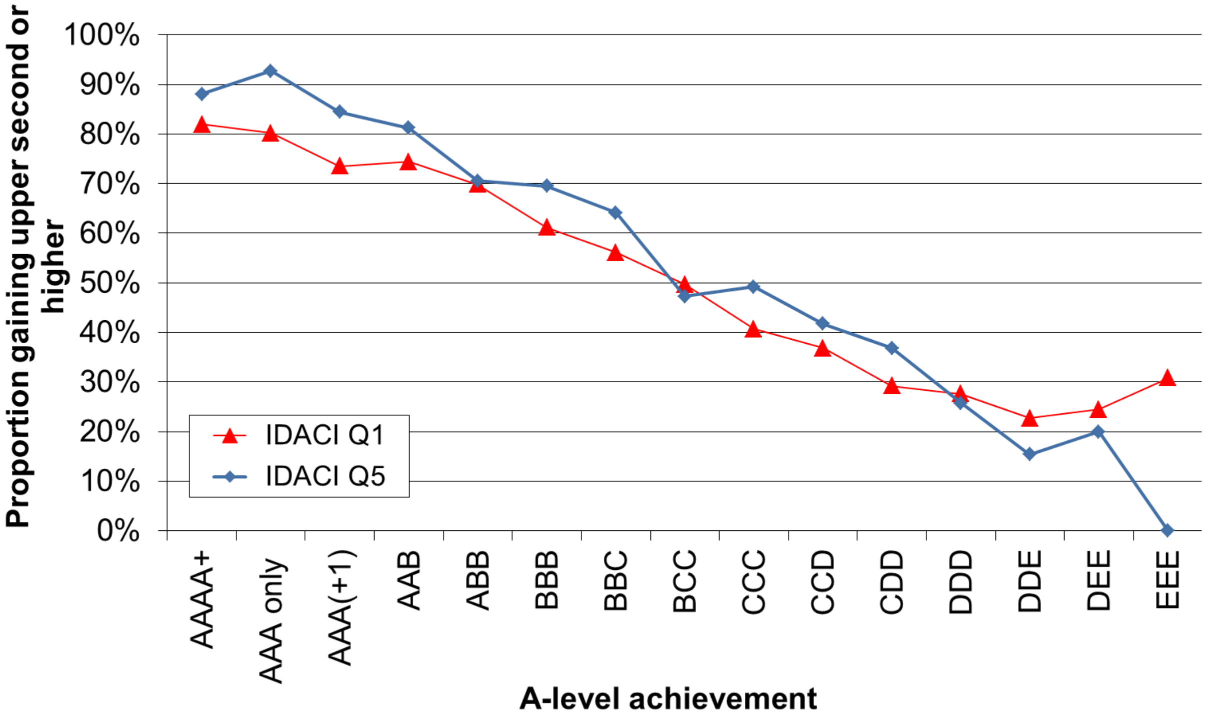
96. Figure 17 shows that, after taking A-level achievement into account, those from the most disadvantaged areas have the lowest HE achievement. As in the previous POLAR section, for clarity, Figure 18 restricts the analysis to examining only those from quintiles 1 (most disadvantaged areas) and 5 (most advantaged areas). It shows a clear consistent difference in HE achievement between the most advantaged and disadvantaged areas, with the proportion gaining an upper second or higher being around 10 percentage points higher for those from the most advantaged areas.

Figure 18 HE achievement and IDACI quintile 1 or 5



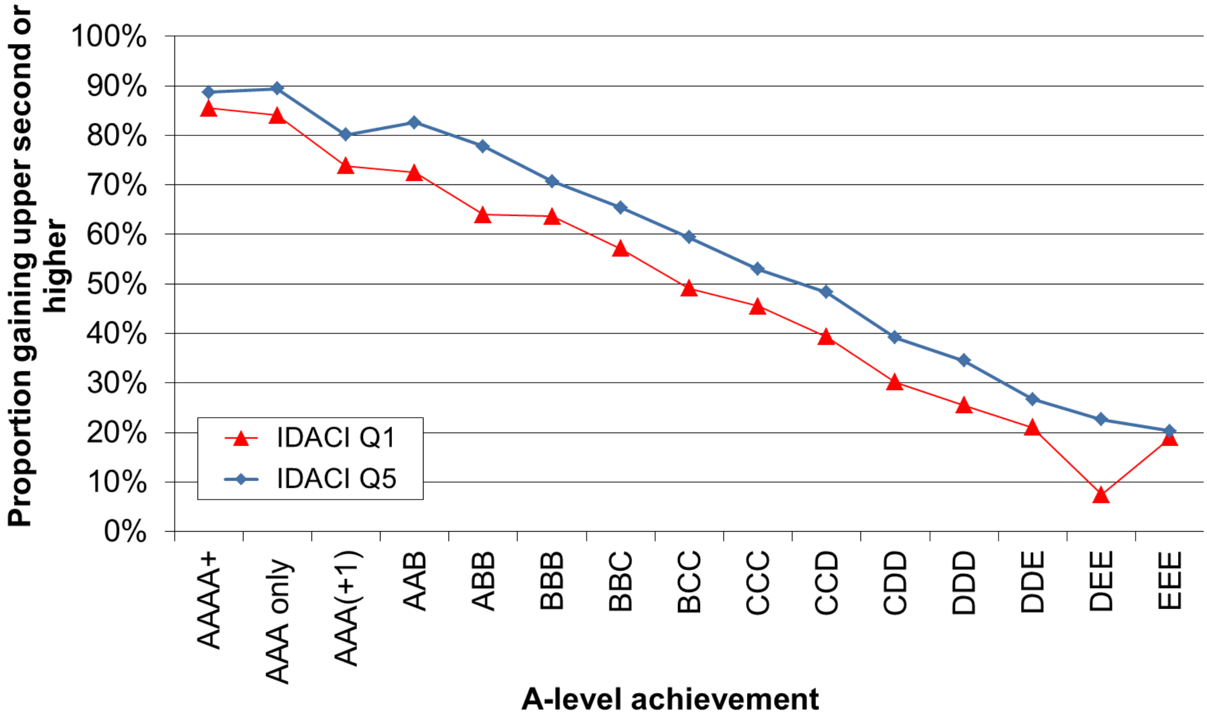
97. Figure 19 replicates Figure 18 but only for those domiciled in London.

Figure 19 HE achievement and IDACI quintile 1 or 5 (London only)



98. Figure 20 repeats the analysis but only for those not domiciled in London.

Figure 20 HE achievement and IDACI quintile 1 or 5 (excluding London)



99. Figures 19 and 20 show that the difference in HE achievement remains when London and non-London entrants are considered as two separate groups, but the clarity of difference is less pronounced for London entrants.

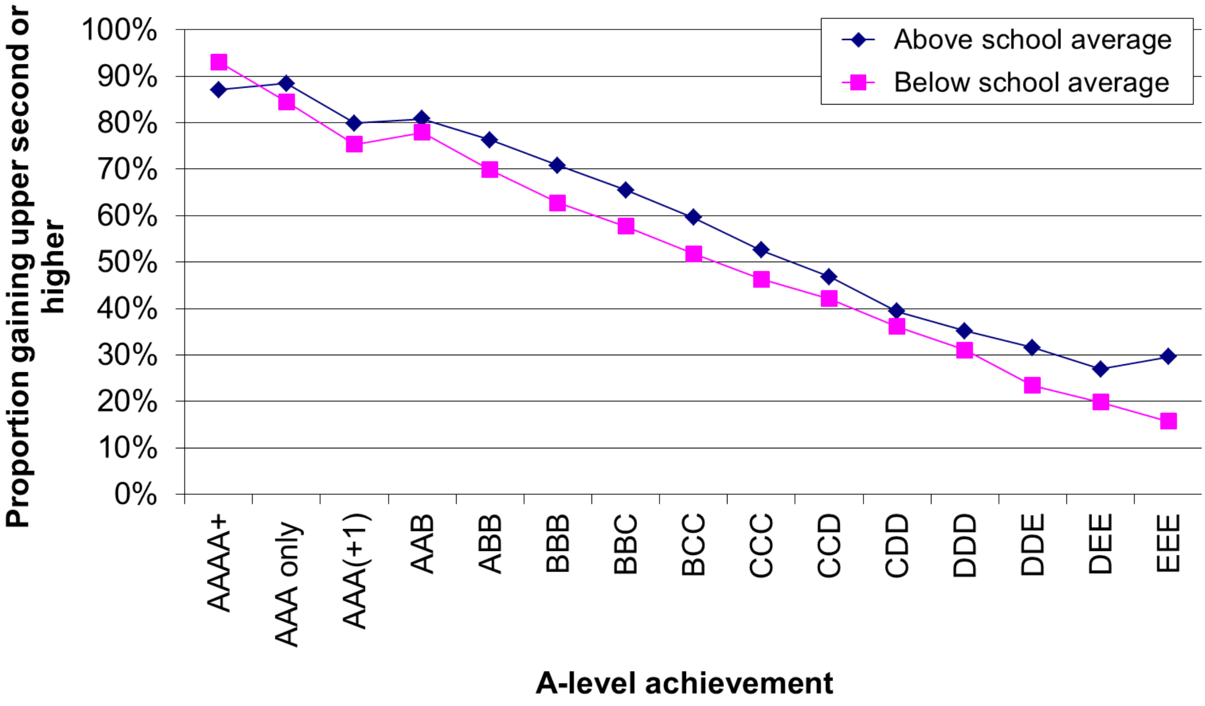
100. Similar results (both globally and for London versus non-London students) are found if other HE achievement measures are used, such as proportion achieving any degree classification.

Individually focused measures

Pupil's position relative to the school average in terms of A-level achievement

101. Figure 21 shows the proportion of the cohort who gain an upper second or higher, by the student's A-level achievement and whether this is above or below the average A-Level achievement for his or her school. For this measure, the relative position of a student's A-level achievement compared with a school's average is calculated using APS as referenced in paragraph 50.

Figure 21 HE achievement and position relative to school average



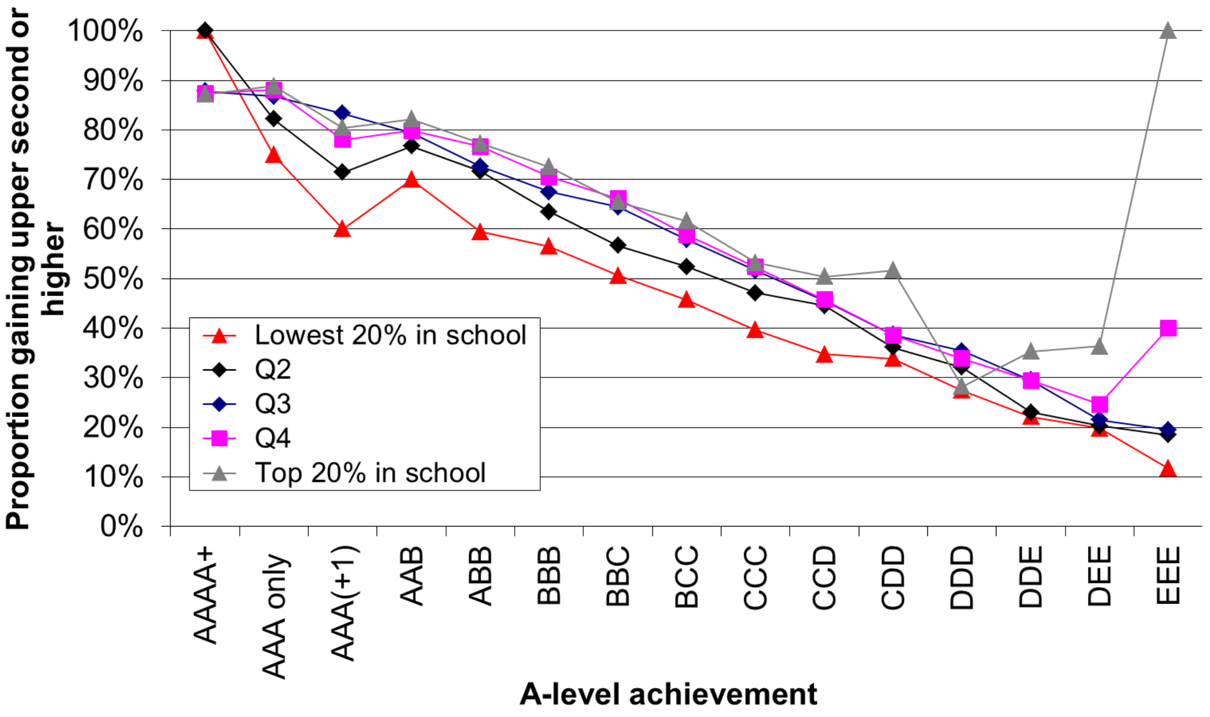
Note: For the highest-achieving A-level students, there are very few students who fall below the school average. Similarly there are very few low-achieving students who are above the school average.

102. Figure 21 shows that students who are below their school average in terms of A-level achievement have lower HE achievement on a like-for-like basis compared with those who are above their school average. Thus, on average, an entrant who gained three B grades at A-level from a school where the average A-level grade per entry is a C will do better in higher education than an entrant who gained three B grades at A-level from a school where the average A-level grade per entry is an A.

Pupil's rank in school in terms of A-level achievement

103. Figure 22 shows the proportion of the cohort who gain an upper second or higher, by the student's A-level achievement and the rank of that achievement relative to other pupils in his or her school. To calculate a student's position, students are ordered in terms of their A-level achievement (as measured through APS). Students whose A-level achievement is in the highest 20 per cent of the school are placed in highest quintile, quintile 5. The other students are then placed into the appropriate lower quintiles based on rank. So in a school with 10 students, there will be two students in each quintile, but in a school with 50 students, there will be 10 students in each quintile.

Figure 22 HE achievement and rank in school



Note: For the highest-achieving A-level students, there are very few students who are in the lowest 20 per cent in school. Similarly there are very few low-achieving students who are in the highest 20 per cent in school.

104. Figure 22 shows that students who fall into the lowest 20 per cent of A-level achievers (quintile 1) in a school have lower HE achievement on a like-for-like basis compared with all other students. For students in the top three quintiles (covering the top 60 per cent of A-level achievers in each school), the relationship between quintiles 3 to 5 and HE achievement is difficult to determine. Note that, due to small numbers in some of the groups at the higher and lower A-level achievement levels, the pattern is more difficult to detect.

Ethnicity

105. Other studies have identified a strong relationship between an individual's ethnicity and degree outcomes or classification[20]. To examine whether such effects are detected in this report's cohort, Figure 23 shows the proportion of the cohort who gain an upper second or higher, by the student's A-level achievement and ethnicity of the student.

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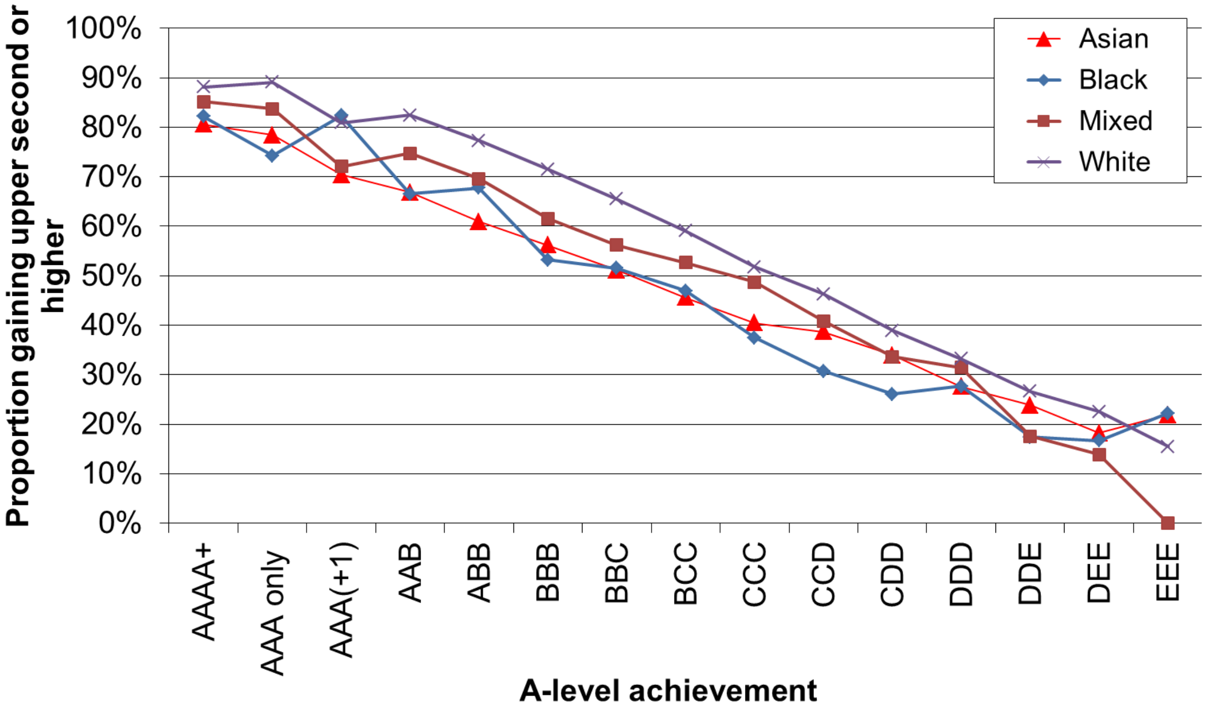
[20] Such as the Higher Education Statistics Agency's and Equality Challenge Unit's work on improving the degree attainment of BME students, 'Improving the degree attainment of black and minority ethnic students', www.ecu.ac.uk/publications/improving-attainment-of-BME-students (accessed January 2014), and 'Student ethnicity: Profile and progression of entrants to full-time, first degree study', HEFCE 2010/13, www.hefce.ac.uk/pubs/year/2010/201013/

Figure 23 HE achievement and ethnicity



106. Figure 23 shows that, after accounting for A-level achievement, those from a white background (marked with a line with crosses) have the highest proportions achieving an upper second or higher.

Gender

107. As with ethnicity, previous studies have examined the differences in degree outcomes for male and female students[21]. Table 8 shows the differences in degree outcomes for men and women in our 2007-08 entrant cohort. It shows that the same proportion (14 per cent) of men and women gain a first-class degree but more women gain an upper second classification – 53 per cent of women gain an upper second compared to 44 per cent of men. The table also shows that a higher proportion of men fail to gain a degree within four years.

[21] Such as the Higher Education Academy's study 'Male access and success in higher education', which found that male entrants are less likely to complete undergraduate courses. This work followed on from the 'Ethnicity, gender and degree attainment' project which HEFCE jointly commissioned with others. The work was carried out by the Higher Education Academy and the Equality Challenge Unit. See www.heacademy.ac.uk/resources/detail/inclusion/ethnicity/ethnicity

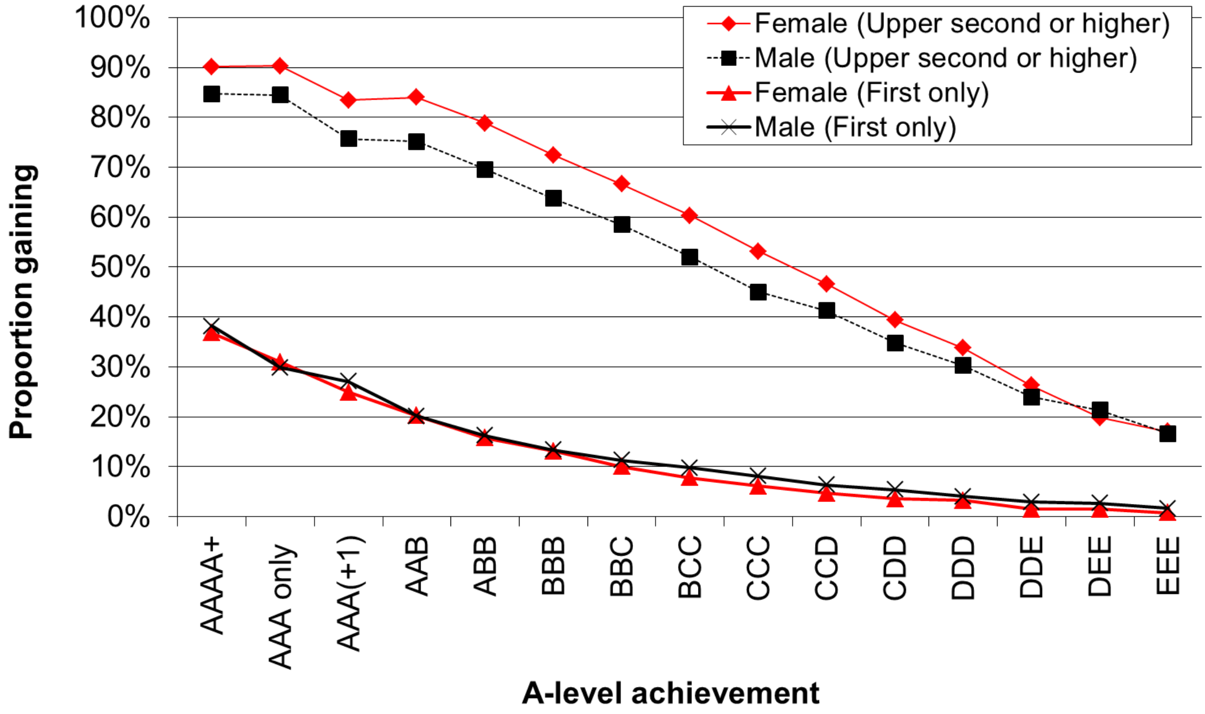
Table 8 Degree outcomes for male and females

Degree outcome	Female		Male	
	N	%	N	%
First	9,960	14%	8,380	14%
Upper second	39,240	53%	25,665	44%
Lower second	14,405	20%	12,480	21%
Third	1,575	2%	2,125	4%
Non-completion or no degree within four years	8,470	12%	9,825	17%
Total	**73,650**	**100%**	**58,475**	**100%**

108. Table 8 does not take into account the differences in prior educational attainment of men and women. Figure 24 shows how the proportions gaining either a first class degree only, or an upper second classification or higher, vary for men and women after accounting for A-level achievement.

109. Figure 24 shows that higher proportions of women gain an upper second or higher compared with men with the same prior educational attainment. When the proportion gaining a first class degree only is considered, there is no difference in the performance of men and women.

Figure 24 HE achievement and gender



Modelling combined effects

110. We have employed regression techniques to establish whether the patterns seen in the simple univariate summaries are robust to the effects of other measurable factors (see below) and unobserved institutional effects (such as different teaching methods). This helps to determine whether other factors might be responsible for the patterns we have observed.

111. The following factors were included in the modelling.

a. For the individual student:

i. A-level achievement[22].

ii. Subject of HE study.

iii. Length of course (three or four years).

iv. Gender (male or female).

v. Ethnicity (Asian, Black, Mixed, White, other or unknown).

vi. Rank in school in terms of A-level achievement (expressed as a quintile).

vii. A-level achievement relative to the average at the school (above or below average).

viii. POLAR quintile of student's home prior to HE entry.

ix. IDACI quintile of student's home prior to HE entry.

x. Whether the student's home prior to HE entry is in London or not.

b. For each HEI:

i. Average A-level tariff points of entrants included in the model.

c. For each school:

i. School performance (as calculated by the Average Points Score).

ii. School type at Key Stage 5 (state or independent).

iii. School type at Key Stage 4 (state or independent).

iv. Admission policy of school (selective or non-selective).

112. For example Table 9 shows, based on the 2007 entrant cohort, that there is a high correlation between school type and school performance. The proportion of entrants who attended independent schools increases as the school performance quintile (as defined in paragraph 50) increases. Of entrants who attended schools in the highest-performance quintile, a third come from independent schools.

[22] A-level achievement is treated as a continuous variable based on the best three A-levels of individuals and tariff groups with a range of 20 points. Additional categorical variables are added for the highest A-level achievement groups to identify supplementary effects for these individuals.

Table 9 Independent schooled students by school performance quintile

School performance quintile	N 2007 entrants	% Independent
Quintile 1	9,610	1.0%
Quintile 2	17,330	2.0%
Quintile 3	29,300	4.2%
Quintile 4	34,390	13.2%
Quintile 5	41,495	33.0%

113. When using only raw comparisons, this high correlation between school performance and school type means that it is difficult to determine whether school type or school performance (or both) is the determining factor in terms of HE achievement. It therefore makes sense to test whether the lower achievement of students from independent schools, compared with students from state schools with the same A-level achievement, could be accounted for by the high average performance of these schools.

114. We cannot assume that the measure of HE achievement is standard throughout the sector, nor can we assume that teaching methods and faculties are uniform between institutions. For example, if it is more difficult to graduate or to gain a high-classification degree from the most selective institutions, then this could create an apparent school-type effect because the most selective institutions tend to have a higher proportion of students from independent schools, even after taking into account subject mix and entry qualification[23].

115. These data have a multi-level structure: there are unobserved attributes associated with students, with HEIs (as discussed above) and potentially subjects within HEIs, and with schools. Therefore for our modelling we have used a multi-level modelling approach, with the proportion of the cohort gaining an upper second or higher as our examined outcome. The modelling is based on the same cohort on which the simple summaries are based: home full-time A-level 18 to 19 year-old[24] entrants to degree courses in 2007-08.

116. Though the number of factors employed is restricted, the resulting models are complex, with large number of significant interactions; consequently, the interpretation of the models is not straightforward. For all modelling results, we measure the effect as the expected increase (or decrease) in HE achievement (as measured by the proportion of the cohort gaining an upper second or higher), using the equivalent increase (or decrease) in A-level tariff that an individual would require to result in the same improvement (or decline) in HE achievement.

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[23] The Performance Indicators published by the Higher Education Statistics Agency on behalf of the UK funding bodies show that the most academically selective institutions tend to have a higher proportion of students from independent schools than would be expected, even after taking into account the subject mix and entry qualifications. See www.hesa.ac.uk/content/view/2072/141/ for further details.

[24] Note that, for ease of interpretation, the model reported here does not include an adjustment for age. Age adjusted and specific models have been tested and the main conclusions of the report are unchanged.

117. The A-level tariff measure used is based on the UCAS tariff, which is a means of allocating points to compare post-16 qualifications used for entry in HE. For A-levels, a difference of 20 points represents a single A-level grade: a C grade at A-level is associated with 80 points, a B grade with 100 points and an A grade with 120 points.

118. For parameter estimates for the main model, see Annex C.

School type

119. Table 10 shows that, other things being equal, students from state schools have higher average HE achievement than students from independent schools.

120. For example, a male student who gained BBB (300 tariff points) at A-level from a state school has the same probability of gaining an upper second or higher as a similar student who gained ABB (320 tariff points) or 20 more tariff points from an independent school. This is represented by the 20 points shown in grey in the table.

121. This school type effect is smaller for women, and for those with the highest A-level achievement. The strength of the effect varies from around 30 tariff points (one and a half A-level grades) to around 5 to 10 tariff points (quarter to a half of an A-level grade).

Table 10 School type effect – A-level tariff point equivalent for increases in chance of getting upper second or higher

A-level achievement (Best 3)	Mean difference in HE achievement (20 points equivalent to 1 A-level grade)	
	Male	Female
DDD (180 points)	24	26
CDD (200 points)	36	31
CCD (220 points)	36	31
CCC (240 points)	33	31
BCC (260 points)	29	28
BBC (280 points)	25	24
BBB (300 points)	20	19
ABB (320 points)	14	14
AAB (340 points)	9	9
AAA or more (360+ points)	7	6

122. The school type effect shown in Table 10 is somewhat artificial, since the performance levels at independent and other school types are so different. In considering what would happen were each student to have attended a different school type, we are, in some cases, extrapolating to combinations of conditions that do not exist – as shown in Table 8, there are very few independent schools that fall into the lowest school performance quintile.

123. Table 11 shows the difference in expected HE achievement between students from independent and state schools for different groups of students (as in Table 10), but simultaneously changes the school performance to make the comparisons more realistic[25]. This provides a more representative interpretation of the model results because it eliminates potential biases due to the narrow and skewed distribution of school performance in independent schools.

Table 11 School type effect with simultaneous change in school performance

A-level profile (Best 3)	Mean difference in HE achievement (20 points equivalent to 1 A-level grade)	
	Male	Female
DDD (180 points)	41	18
CDD (200 points)	42	23
CCD (220 points)	40	25
CCC (240 points)	36	26
BCC (260 points)	32	23
BBC (280 points)	27	20
BBB (300 points)	22	16
ABB (320 points)	16	12
AAB (340 points)	10	7
AAA or more (360+ points)	9	6

124. Table 11 shows that, even when we change school performance along with school type so that we have a more realistic comparison, the HE achievement of students from state schools is consistently higher than for students from independent schools. The strength and pattern of effects are similar to those noted in Table 10.

125. The equivalent results obtained when restricting the HE achievement examined to those who achieve a first class degree only are given in Annex D Table D1. A similar pattern is seen, but with stronger school type effects.

School performance

126. A similar approach to above can be taken for examining the effect of school performance. In this case, rather than changing the school type, we decrease the school APS for all individuals in the data by 137 points: this is the difference between the average school APS for state and independent schools.

[25] Only state students were selected from the whole dataset and then their school type was changed to independent. The students' state school performance was also modified to a randomly selected independent school performance. The corresponding increase in A-level points was calculated to achieve the same HE achievement. This process was repeated for 50 simulations and the mean results are reported. Further details are at Annex C of HEFCE 2003/32.

127. A policy of making discounted offers to students from lower-performing schools is based on the assumption that, all other things being equal, students from a lower-performing school will go on to higher HE achievement. Table 12 shows what happens when we use the model to reduce the school performance for each student, keeping all other characteristics the same. Based on the existing assumptions, we would expect the average HE achievement to increase.

128. However, Table 12 shows that decreasing school performance does not necessarily lead to an expected increase in HE achievement. For example, consider men with BCC (equivalent to 260 A-level tariff points): the effect of decreasing their school performance produces an increase in their expected HE achievement (equivalent to each individual having four more tariff points).

129. Table 12 also shows that the effects are small in comparison to school type effects already noted, and are inconsistent for men and women. For men the difference is positive or near zero, and for women, it is negative.

Table 12 School performance effect – A-level tariff point equivalent for change in chance of getting upper second or higher for 137 APS decrease in school performance

A-level profile (Best 3)	Mean difference in HE achievement (20 points equivalent to 1 A-level grade)	
	Male	Female
DDD (180 points)	9	-3
CDD (200 points)	8	-3
CCD (220 points)	6	-3
CCC (240 points)	5	-3
BCC (260 points)	4	-3
BBC (280 points)	3	-3
BBB (300 points)	2	-4
ABB (320 points)	2	-4
AAB (340 points)	1	-4
AAA or more (360+ points)	0	-4

130. The equivalent results obtained when restricting the HE achievement examined to those who achieve a first class degree only are given in Annex D Table D2. A more inconsistent and weaker pattern is seen when this more focused HE achievement is considered.

131. Figure 2 in the raw comparisons confirms this result, as the school performance quintiles overlap and change relative position depending on the A-level achievement of the individual. For some groups of students, those who attended a school in performance Quintile 4 do better than those in Quintiles 1 to 3, and vice-versa.

132. However, there is some consistency in the raw summary, with students who attended a school in the highest-performance quintile (Q5) generally having a lower HE achievement when compared on a like-for-like basis.

133. To explore this in more detail, Table 13 shows, for only those who attended a school in Q5 (schools with the highest performance), the effect on HE achievement (expressed in terms of the change required in an individual's A-level tariff points to generate the same change in HE achievement) of changing their school performance quintile to Q1 (schools with the lowest performance).

134. The effect on an individual's likelihood of gaining a high classification degree by notionally changing an individual's school from the highest to lowest school performance quintile is inconsistent. For men, the effect always produces a positive influence on HE achievement: for all male students, a higher HE achievement is noted but the size varies from 29 tariff points (or around one and a half A-level grades) for the lowest-achieving students, to near zero for the highest achieving students. For women, the effect is negative and small.

Table 13 School performance effect – A-level tariff point equivalent for change in chance of getting upper second or higher by moving from highest to lowest school performance quintile

A-level profile (Best 3)	Mean difference in HE achievement (20 points equivalent to 1 A-level grade)	
	Male	Female
DDD (180 points)	29	-6
CDD (200 points)	24	-7
CCD (220 points)	20	-7
CCC (240 points)	16	-8
BCC (260 points)	13	-9
BBC (280 points)	10	-9
BBB (300 points)	8	-9
ABB (320 points)	6	-9
AAB (340 points)	4	-9
AAA or more (360+ points)	2	-9

Additional model conclusions for other factors

Other school characteristics

135. The effect of the school admissions policy (selective or not) is positive and small. This means that students from non-selective schools are likely to do less well in HE than similar

students from selective schools. This modelling result is different to the pattern seen in the raw data (Figure 7).

Other characteristics

136. After accounting for other factors, entrants who had lower A-level achievement compared with others in the same school do less well than entrants who had higher A-level achievement relative to others in the same school. That is, on average, an entrant who gained three B grades at A-level from a school where the average A-level grade per entry is a C grade will do better in higher education than an entrant who gained three B grades at A-level from a school where the average A-level grade per entry is an A grade.

137. After accounting for other factors, the relationship between measures relating to pre-HE domicile and HE achievement vary depending on the pre-HE domicile measure used and should be treated with caution if used in applicant assessments. On a like-for-like basis, when using IDACI, those from the most disadvantaged areas do consistently less well in higher education than those from other areas. For POLAR, the effect is similar but much smaller.

138. A-level grades remain the single most important factor in determining higher education achievement.

Testing schooling effects conclusions from modelling

139. This report does not attempt to establish the causes of lower than expected HE achievement for students from independent schools, although it is able to discount some plausible hypotheses.

140. As discussed in paragraphs 110 to 114, there were main two aspects of the data that could have a distorting effect on the findings.

a. The first is the high correlation between school performance and school type measures.

b. The second difficulty is that it cannot be assumed that our measure of HE achievement (in most cases, proportion achieving a first or upper second) is standardised across HEIs, and students from independent schools tends to be over-represented in certain HEIs.

141. With these difficulties in mind, we carried out the following analysis.

a. Extending the descriptive statistics.

b. The modelling described in paragraphs 110 to 118.

c. Modifications to how the main model is specified.

d. Modelling without high-performing independent schools.

e. Modelling only with HEIs with high average tariff scores.

f. Modelling using weighted data so that independently schooled students are redistributed across institutions.

142. For further details of these analyses, see Annex B.

Variation in schooling effects for different sub-groups of students

Variation between higher education institutions

143. Institutional studies on schooling effects have produced varied results that are not always consistent with each other. In some cases, the studies have concluded that the school type effect is not detectable at the institution in question. In some cases, such conclusions are based on making a simple comparison between the degree outcomes of students from state and independent schools without taking other factors into account, most importantly their entry qualifications.

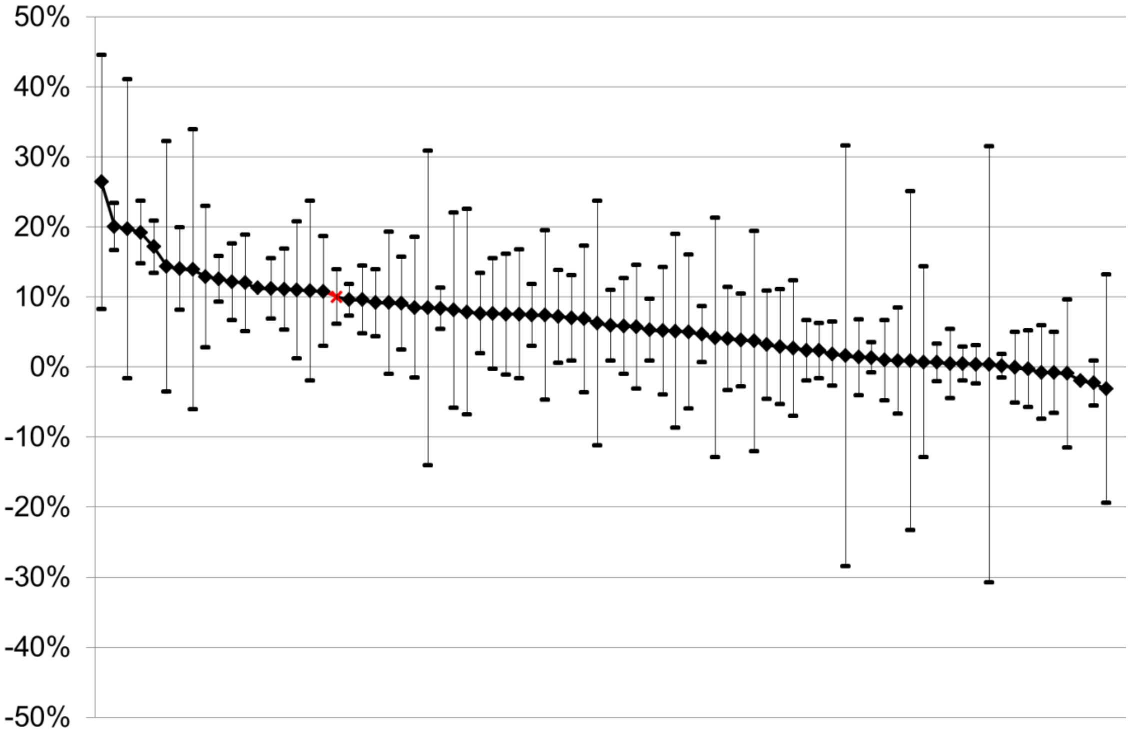
144. In addition to the complications of ensuring institution-based comparisons are made on a like-for-like basis, studies undertaken at the HEI level can often be difficult because the size of the expected chance year-on-year variation is similar to the differences in HE achievement expected from school type effects. It would often be necessary to pool data from several cohorts to investigate these effects.

145. To examine whether the strength of school type effects are consistent across institutions, a two-stage approach is taken. Initially the raw unadjusted (or observed) institutional[26] differences in the proportions of state- and independently schooled students gaining a first or upper second are calculated. These have been calculated for four cohorts (HE entrants in 2004-05, 2005-06, 2006-07 and 2007-08).

146. Figure 25 shows the average difference (in percentage points) for the four cohorts, with error bars representing the variation of this difference for the four cohorts of entrants between 2003-04 and 2007-08. Each point on the chart represents a single HEI and shows the observed school type effect at that HEI (To illustrate, consider an institution where 80 per cent of independently schooled students gain a first or upper second, and the equivalent figure for state-schooled students is 90 per cent. The difference in performance between these two sets of students would be +10 percentage points. This HEI would appear on the left hand side of Figure 24, in the position indicated by a cross.)

[26] For all institutional calculations in this report, the first institution is taken. Therefore for students who transfer between institutions, the institution they initially entered is reported.

Figure 25 Observed school type effect for each HEI

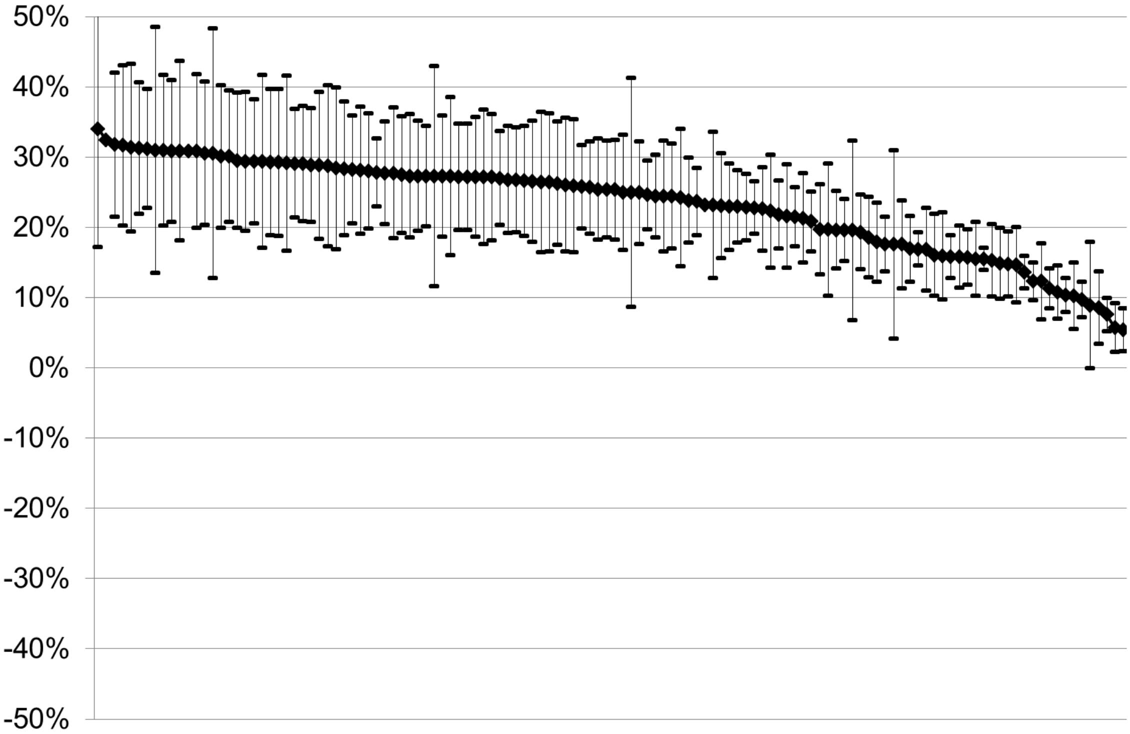


147. Figure 24 shows that for the majority of institutions, the observed school effect is positive (so that state-schooled students gain, proportionally, more first or upper second degree classifications than independently schooled students at the same institution). In a small number of cases (fewer than 10), the observed difference is negative (so that independently schooled students achieve more high classifications).

148. However, as outlined above, these raw comparisons do not take into account other factors that may vary between independently and state-schooled students at the same institutions and which might affect the likelihood of gaining a high classification.

149. Using the modelling as given in paragraphs 110 to 118, but splitting by institution rather than considering the sector as a whole, the underlying schooling effect for each institution can be estimated. This is effectively the observed institutional difference between state- and independent-schooled students but adjusted for differences in state and independent school profile (for factors such as A-level achievement, and HE subject choice). Figure 26 shows these adjusted differences.

Figure 26 Adjusted school type effect for each HEI



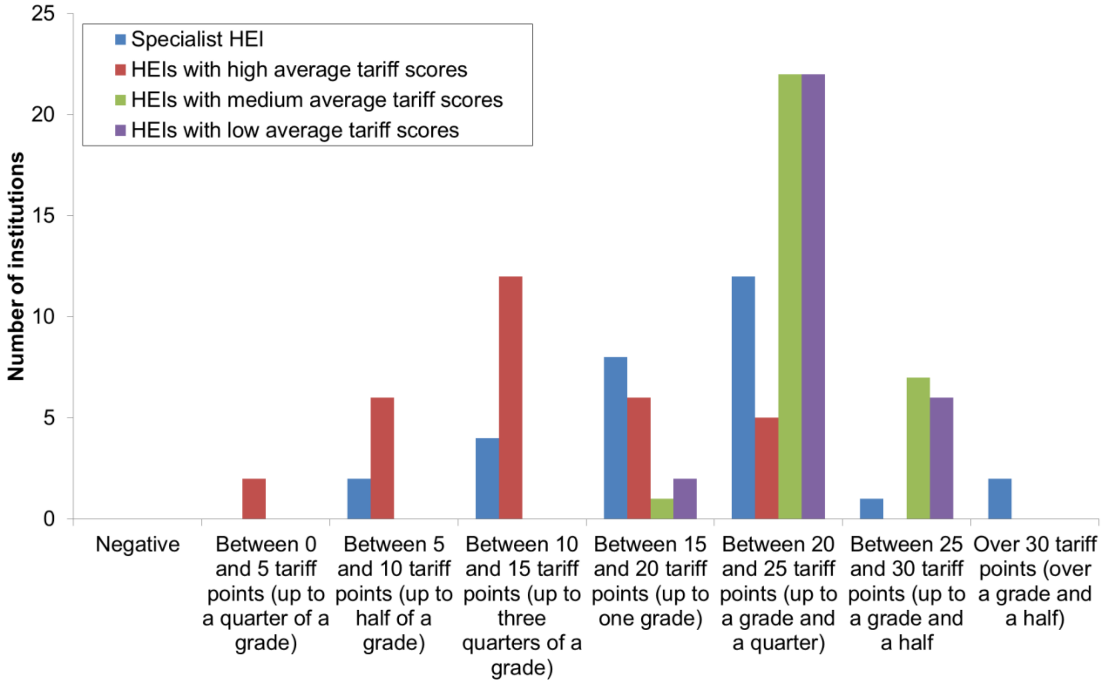
Note: Figure 25 is based on the 2007-08 entrant cohort and therefore contains fewer HEIs than Figure 26.

150. Figure 26 shows that for all institutions, there is a positive schooling effect: on a like-for-like basis, state-schooled outperform independently schooled students at all institutions. As shown in Table 10, the school effect is smaller for students with high A-level achievement, so we would expect the most highly selective institutions to have a smaller independent school effect. These institutions are generally towards the right hand side of Figure 26 and have the smallest school type effects, where the proportion of state-schooled students who achieve high classifications is around five percentage points higher than their independently schooled institutional peers.

151. As described in paragraphs 116 and 117, these percentage-point differences can be converted into a figure representing the necessary difference in A-level tariff between two students (identical except that from one is independently schooled and the other state-schooled at Key Stage 5) to generate the difference in likelihood of gaining a high classification. Figure 27 shows the size of the individual institutional effects using this A-level tariff approach, split by institutional group[27].

[27] The institutional groups used are given in 'Higher education in England: Impact of the 2012 reforms' (HEFCE 2013/03) www.hefce.ac.uk/about/intro/abouthighereducationinengland/impact/, page 35.

Figure 27 Distribution of differences by institution and type (adjusted differences)

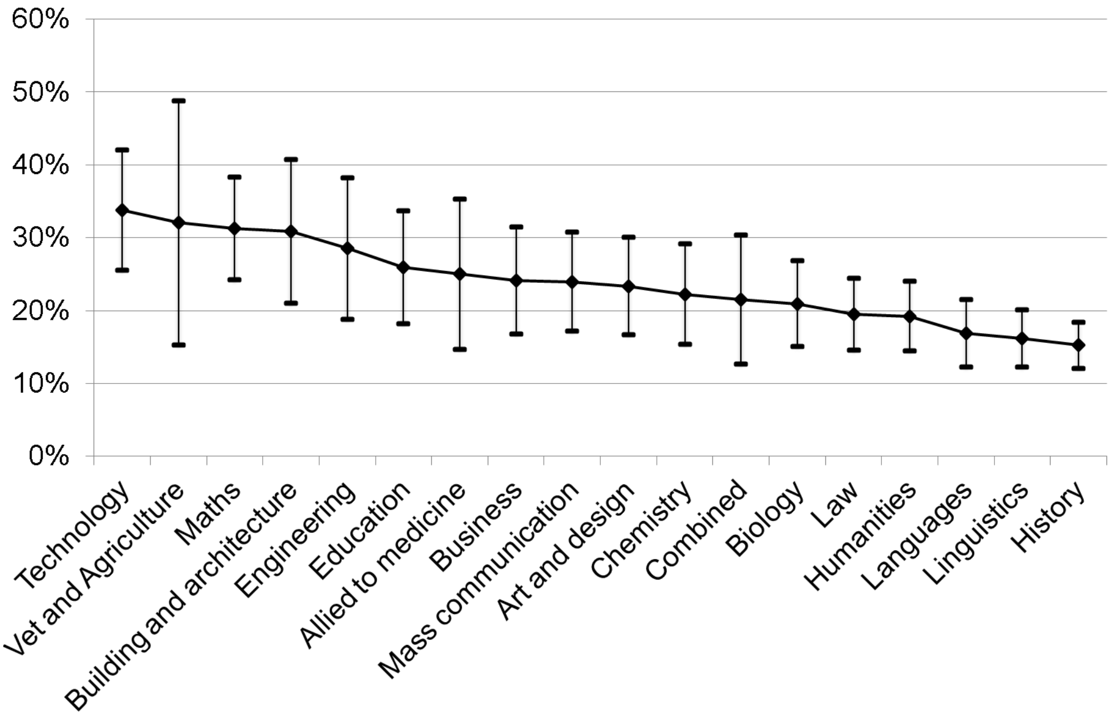


152. Figure 27 shows that the magnitude of the school effect varies from around five tariff points (or a quarter of an A-level grade) to more than 30 tariff points (or one and a half A-level grades).

Variation in effects by subject

153. The variation in schooling effect by broad subject area can also be examined using the same approach as given in the previous section. Figure 28 shows the equivalent of Figure 26, but showing the variation in schooling effect (based on adjusted differences) for different subject areas.

Figure 28 Adjusted difference in HE achievement between state- and independently schooled students



154. Figure 28 shows that there is less variation in the school type effect across broad subject areas that there is for institutions. Scientific subjects tend to experience higher school type effects, and humanities and language based subjects weaker school type effects. However all subject areas experience a school type effect of between 15 and 35 percentage points. It is important to note that the differences in entrant characteristics between subject areas will also affect the results given above: for example, maths has a high proportion of male entrants, who in turn, experience higher school type effects.

Annex A: Exclusions from population

Table A1 Exclusions from population of 18 and 19 year old entrants to full-time degree courses at UK HEIs

Reason for exclusion	**2004**	**2005**	**2006**	**2007**
Original population	179,735	194,880	187,285	196,555
Medicine/Dentistry course	4,685	4,690	4,765	4,700
Course longer than four years	3,155	4,270	3,640	3,660
Degree does not receive a classification	1,085	980	855	1,025
Not holding three A-levels	40,880	43,530	43,715	40,455
Scottish or Northern Irish student	2,620	2,680	2,650	2,925
Welsh student	4,435	4,525	3,835	3,690
Unknown school type	5,315	5,595	3,915	3,995
No school quality measure	3,495	3,660	3,670	3,980
Final population used for analysis	**114,070**	**124,950**	**120,235**	**132,125**

Annex B Further details of testing of results

1. There were main two aspects of the data that could have a distorting effect on the findings.

   a. The first is the high correlation between school performance and school type measures.

   b. The second difficulty is that it cannot be assumed that our measure of higher education (HE) achievement (in most cases, proportion achieving a first or upper second) is standardised across higher education institutions (HEIs), and students from independent schools tend to be over-represented in certain HEIs.

2. With these difficulties in mind, we carried out the following analysis.

   a. Extending the descriptive statistics.

   b. The modelling described in paragraphs 110 to 118 of the main report.

   c. Modifications to how the main model is specified.

   d. Modelling without high-performing independent schools.

   e. Modelling only with HEIs with high average tariff scores.

   f. Modelling using weighted data so that independently schooled students are redistributed across institutions.

3. Approaches a to c described explored the possible effects of both difficulties; approach d tests in particular for effects relating to the high correlation between performance and type; and approaches e and f test for effects relating to the differences in the measure of HE achievement.

Approach a: Extending the descriptive statistics

4. We have broken down some of the main descriptive statistics by a number of key groups to test whether the main conclusions persist. For example, the examination of the relationship between school performance and HE achievement has been considered at a sector-wide level as well as for state schools only (Figures 2 and 3). Other breakdowns have been examined which are not reported in this document.

Approaches b and c: Model specification

5. As described in paragraphs 110 to 118 of the main report, the model specification used in this analysis allows for the measure of HE achievement to vary across the sector. For example, if it is more difficult to gain a high classification degree from particular parts of the HE sector, the model specification is designed to account for the measure varies between HEIs.

6. The modelling does indeed show significant unexplained variation by institution in the likelihood of gaining an high classification degree. After accounting for the variation in student profiles at different HEIs (including entry qualifications and subjects studied), the modelling indicates that the proportion of an institutional cohort gaining a first or upper second degree classification can vary from the sector average (adjusted) by between -9 (the cohort rate is nine percentage points lower than expected from modelling) and +14 percentage points.

7. A number of different model specifications were considered, to ensure that the effects being observed were not due to the failure to account for key factors correctly. These include

changing how individual school effects were accounted for, and models including different approaches to categorising prior achievement.

Approach d: Modelling without high-performing independent schools

8. A high proportion of the very highest-performing schools are independent, and there is a risk that this correlation between school performance and school type could have a confounding effect on our conclusions about school type. We have therefore carried out analysis and modelling excluding some parts of the school sector. We have re-run our modelling a number of times, progressively removing more and more of the highest-performing schools. There was no reduction in the independent school effects with these alternative models.

Approach e: Modelling only with HEIs with high average tariff scores

9. In paragraphs 128 to 139 of the main report we examine the size of the independent school effect for different parts of the HE sector. As well as allowing us to assess the reduction of the independent school effect for institutions with the highest average tariff score entry profiles, it allows us to test whether the potential variation in difficulty in gaining a high classification from different parts of the sector affects our main conclusions on school type.

10. We do this by applying our model approach to the group of HEIs with the highest average tariff scores. The modelling results still show an independent school effect, with an inconsistent school performance effect. Table B1 shows the equivalent of Table 10 for only those HEIs with high average tariff scores.

Table B1 School type effect with simultaneous change in school performance (only HEIs with high average tariff scores)

A-level profile (Best 3)	Mean difference in HE achievement	
	Male	Female
DDD (180 points)	7	-6
CDD (200 points)	11	2
CCD (220 points)	32	17
CCC (240 points)	31	21
BCC (260 points)	29	21
BBC (280 points)	25	19
BBB (300 points)	20	15
ABB (320 points)	15	11
AAB (340 points)	9	7
AAA or more (360+ points)	8	5

Approach f: Modelling using weighted data so that independently schooled students are redistributed across institutions

11. To test the hypothesis that variation in the measure of HE achievement at different HEIs could be causing the schooling effects, we weighted each observation so that the numbers of students from independent and state schools were the same as the sector average for any given institution, and for various other factors like A-level tariff score. The results from modelling these weighted data showed no significant differences in the school type factors, and we conclude that any unaccounted for differences in HE achievement between HEIs due to this 'varying difficulty factor' is insufficient to account for the school type effect.

12. To demonstrate this, Table B2 shows the equivalent of Table 10 using weighted data so that independent schooled students are redistributed across institutions.

Table B2 School type effect with simultaneous change in school performance (weighted data)

A-level profile (Best 3)	Mean difference in HE achievement	
	Male	Female
DDD (180 points)	44	20
CDD (200 points)	43	23
CCD (220 points)	41	26
CCC (240 points)	36	25
BCC (260 points)	32	24
BBC (280 points)	28	21
BBB (300 points)	23	18
ABB (320 points)	19	15
AAB (340 points)	14	11
AAA or more (360+ points)	11	9

Annex C Parameter estimates from modelling

The model fitted is a multi-level logistic model with a random intercept (varying by higher education institution), and a random coefficient effect (vary by higher education institution) fitted for the independent school effect. Therefore the multi-level elements of this model are entrants nested within higher education institutions. Table C1 shows the model parameter estimates for the fixed effects in this model. Table C2 shows the model parameter estimates for the random effects (intercept and random coefficient on the independent school effect) in this model.

Table C1 Fixed effects from modelling

Effect group	Effect	Parameter	Standard deviation	P-Value
Intercept		-2.575	0.3148	<0.0001
Gender	Female	Baseline		
	Male	0.8245	0.3540	0.0197
Course length	Three years	Baseline		
	Four years	0.007737	0.01745	0.6533
Subject area	Allied to medicine	0.05698	0.1586	0.7193
	Biology	-0.2300	0.1189	0.0524
	Veterinary sciences and Agriculture	3.2854	0.5165	<0.0001
	Chemistry	0.4771	0.1437	0.0009
	Mathematics	1.3694	0.1365	<0.0001
	Engineering	0.5676	0.1637	0.0005
	Technology	1.1239	0.5143	0.0289
	Building	0.007927	0.2862	0.9785
	Humanities	-0.6910	0.1472	<0.0001
	Law	-1.0579	0.1609	<0.0001
	Business	0.1601	0.03799	<0.0001
	Mass communication	-0.4882	0.1948	0.0121
	Linguistics	-1.018	0.1682	<0.0001
	Languages	-0.2425	0.05298	<0.0001

	History	-1.281	0.1959	<0.0001
	Art and design	Baseline		
	Education	-0.1375	0.04488	0.0019
	Combined	-1.411	0.5789	0.0147
Institution	Average A-level tariff points of entrants	-2.778	0.4077	<0.0001
	Squared effect	-0.6510	0.3653	0.0771
Student A-level achievement	A-level tariff points	0.007530	0.001606	<0.0001
	Squared effect	0.000007639	0.000002908	0.0085
	Holding 4 or more A-grades	0.3448	0.06159	<0.0001
	Holding 3 A-grades and at least one additional B to E grade	-0.2507	0.05923	<0.0001
School performance	Average APS score for school	0.0006540	0.0004820	0.1744
	Squared effect	-0.0000005760	0.0000001	<0.0001
School type	Non-independent (KS5)	Baseline		
	Independent (KS5)	0.9802	0.4917	0.0461
	Change from Independent (KS4) to non-Independent (KS5)	-0.1978	0.03827	<0.0001
	Change from non-Independent (KS4) to Independent (KS5)	-0.02329	0.07722	0.7632
School admission policy	Non-selective	Baseline		
	Selective	0.1027	0.02466	<0.0001
POLAR	Quintile 1 (Lowest)	Baseline		
	Quintile 2	0.06225	0.02897	0.0315
	Quintile 3	0.1000	0.02921	0.0006
	Quintile 4	0.1043	0.03026	0.0023
	Quintile 5 (Highest)	0.09881	0.03237	0.0058
IDACI	Quintile 1 (Lowest)	Baseline		
	Quintile 2	0.07052	0.02551	0.0058
	Quintile 3	0.1211	0.02706	<0.0001
	Quintile 4	0.1781	0.02905	<0.0001
	Quintile 5 (Highest)	0.2439	0.03179	<0.0001

Rank position in school of student's A-level achievement	Top 20 per cent in school	Baseline		
	Quintile 2	-0.1580	0.02075	<0.0001
	Quintile 3	-0.2333	0.02458	<0.0001
	Quintile 4	-0.3106	0.03517	<0.0001
	Bottom 20 per cent in school	-0.5380	0.04304	<0.0001
Student's A-level achievement relative to school average	Below	Baseline		
	Above	0.1066	0.02368	<0.0001
Ethnicity (background)	White	Baseline		
	Asian or Asian British	-0.4160	0.02333	<0.0001
	Black or Black British	-0.5607	0.03798	<0.0001
	Mixed	-0.2862	0.03581	<0.0001
	Other and unknown	-0.3668	0.04163	<0.0001
Region of pre-higher education domicile	North East	Baseline		
	North West	-0.09230	0.04036	0.0223
	Yorkshire and Humberside	0.1371	0.04087	0.0008
	East Midlands	0.2838	0.04248	<0.0001
	West Midlands	0.2414	0.04273	<0.0001
	East of England	0.3788	0.04174	<0.0001
	Greater London	0.2334	0.04243	<0.0001
	South East	0.3073	0.04077	<0.0001
	South West	0.3813	0.04406	<0.0001
	Unknown	0.1407	0.1310	0.2826
Interaction terms	(Institutional average A-level tariff points) x (Student A-level tariff points)	0.008994	0.001140	<0.0001
	(Allied to medicine) x (Student A-level tariff points)	-0.001140	0.0005700	0.0459
	(Biology) x (Student A-level tariff points)	0.0005790	0.000427	0.1768
	(Veterinary Sciences and Agriculture) x (Student A-level tariff points)	-0.01034	0.001435	<0.0001
	(Chemistry) x (Student A-level tariff points)	-0.00254	0.0004960	<0.0001
	(Mathematics) x (Student A-level tariff points)	-0.0068	0.0004810	<0.0001

	(Engineering) x (Student A-level tariff points)	-0.00409	0.0005780	<0.0001
	(Technology) x (Student A-level tariff points)	-0.00631	0.001312	<0.0001
	(Building) x (Student A-level tariff points)	-0.00450	0.0008150	<0.0001
	(Humanities) x (Student A-level tariff points)	0.001230	0.0004700	0.0087
	(Law) x (Student A-level tariff points)	0.001575	0.0005550	0.0047
	(Mass Communication) x (Student A-level tariff points)	0.001376	0.0007560	0.0688
	(Linguistics) x (Student A-level tariff points)	0.003384	0.0005900	<0.0001
	(History) x (Student A-level tariff points)	0.003270	0.0005960	<0.0001
	(Combined) x (Student A-level tariff points)	0.005052	0.002164	0.0195
	(Allied to medicine) x (Male)	-0.2912	0.06312	<0.0001
	(Biology) x (Male)	-0.3699	0.04645	<0.0001
	(Veterinary sciences and Agriculture) x (Male)	-0.2277	0.1664	0.1713
	(Chemistry) x (Male)	-0.4849	0.05674	<0.0001
	(Technology) x (Male)	-0.5304	0.1395	0.0001
	(Humanities) x (Male)	-0.2296	0.04740	<0.0001
	(Law) x (Male)	-0.2307	0.06035	0.0001
	(Business) x (Male)	-0.3652	0.04677	<0.0001
	(Linguistics) x (Male)	-0.1702	0.06586	0.0098
	(Languages) x (Male)	-0.3063	0.07806	<0.0001
	(History) x (Male)	-0.2718	0.05865	<0.0001
	(Education) x (Male)	-0.2325	0.1044	0.0265
	(Veterinary sciences and Agriculture) x (Average APS score for school)	-0.001080	0.0005670	0.0562
	(Technology) x (Average APS score for school)	0.0009920	0.0005340	0.0636
	(Building) x (Average APS score for school)	0.0009010	0.0002920	0.0022
	(Humanities) x (Average APS score for school)	0.0002520	0.0001470	0.0863
	(History) x (Average APS score for school)	0.0005680	0.0001970	0.004
	(Male) x (Student A-level tariff points)	-0.001160	0.001273	0.3596
	(Male) x (Average APS score for school)	-0.001120	0.0004530	0.013
	(Male) x (Student A-level tariff points) x (Average APS score for school)	0.000001321	0.000001595	0.4063

	(Student A-level tariff points) x (Average APS score for school)	0.000001725	0.000001299	0.1852
	(Student A-level tariff points) x (Independent school)	-0.01592	0.003440	<0.0001
	(Student A-level tariff points) x (Student A-level tariff points) x (Independent school)	0.00003000	0.000006180	<0.0001
	(Holding 4 or more A-grades) x (Independent school)	-0.08460	0.09673	0.3809
	(Holding 3 A-grades and at least one additional B to E grade) x (Independent school)	-0.4310	0.1156	0.0002
	(Average APS score for school) x (Independent school)	0.0008090	0.0001700	<0.0001

Note: KS = Key Stage; APS= Average Level 3 Points Score

Table C2 Random effects from modelling (institutional)

	Intercept			Random coefficient (independent effect)		
Institution	**Parameter**	**Standard deviation**	**P-Value**	**Parameter**	**Standard deviation**	**P-Value**
Anglia Ruskin University	-0.08469	0.08181	0.3006	0.000048	0.007492	0.9949
Aston University	0.07855	0.07283	0.2808	0.000101	0.00749	0.9892
University of Bath	-0.1725	0.08114	0.0335	0.000302	0.007485	0.9678
Bath Spa University	0.1099	0.08804	0.2117	-4.76E-06	0.007491	0.9995
University of Bedfordshire	0.1035	0.106	0.3288	0.000091	0.007493	0.9903
University of Birmingham	-0.04738	0.06071	0.4351	0.000751	0.007475	0.92
Birmingham City University	0.07685	0.06969	0.2701	0.000101	0.007491	0.9892
University College Birmingham	0.03799	0.1511	0.8015	0.00004	0.007493	0.9958
Bishop Grosseteste University	-0.1513	0.1437	0.2925	-0.00006	0.007493	0.994
University of Bolton	-0.1256	0.139	0.3661	5.86E-06	0.007493	0.9994
Arts University Bournemouth	-0.2089	0.13	0.1082	-0.00003	0.007492	0.9973
Bournemouth University	-0.07526	0.06165	0.2222	-0.00028	0.007488	0.9704
University of Bradford	-0.07095	0.0903	0.432	-0.00052	0.007492	0.9445
University of Brighton	-0.0958	0.06169	0.1205	0.000026	0.007488	0.9973
University of Bristol	-0.05328	0.07736	0.491	-0.0002	0.007476	0.9791

Brunel University	0.2034	0.05788	0.0004	0.000543	0.007488	0.9422
Buckinghamshire New University	0.004247	0.1274	0.9734	-0.00008	0.007492	0.9916
University of Cambridge	-0.1132	0.1218	0.3529	0.00059	0.007481	0.9372
Canterbury Christ Church University	-0.1105	0.08163	0.1759	0.000012	0.007492	0.9987
University of Central Lancashire	0.0389	0.07915	0.6231	-0.00012	0.007492	0.9875
University of Chester	-0.02462	0.07191	0.7321	-0.00003	0.007492	0.9967
University of Chichester	0.007542	0.09996	0.9399	0.000056	0.007492	0.994
City University, London	-0.08021	0.07816	0.3048	-0.00024	0.00749	0.9749
Courtauld Institute of Art	0.1617	0.2042	0.4286	0.000098	0.007493	0.9895
Coventry University	0.3462	0.06471	<.0001	0.000036	0.007491	0.9962
University for the Creative Arts	-0.2993	0.09195	0.0011	-0.00008	0.007492	0.9916
University of Cumbria	-0.04939	0.09325	0.5963	9.83E-06	0.007493	0.999
Conservatoire for Dance and Drama	-0.02232	0.2033	0.9126	0.000014	0.007493	0.9985
Dartington College of Arts	-0.1313	0.1827	0.4724	0.000054	0.007493	0.9943
De Montfort University	0.07071	0.06367	0.2668	0.000131	0.007491	0.9861
University of Derby	0.007927	0.08369	0.9245	-0.00017	0.007492	0.9817
University of Durham	0.1019	0.0744	0.1709	-0.00055	0.007475	0.9412
University of East Anglia	-0.02374	0.06311	0.7068	0.000242	0.007485	0.9742
University of East London	0.1984	0.11	0.0712	0.000068	0.007493	0.9927
Edge Hill University	-0.00048	0.08318	0.9954	-0.00002	0.007493	0.9977
University of Essex	-0.1299	0.07147	0.0692	0.000056	0.007491	0.994
University of Exeter	0.4447	0.0706	<.0001	0.000246	0.007479	0.9738
Falmouth University	-0.1663	0.1208	0.1686	0.000091	0.007492	0.9903
University of Gloucestershire	0.0682	0.0789	0.3874	0.0004	0.007491	0.9575
Goldsmiths’ College	-0.2592	0.08807	0.0033	-0.00002	0.007491	0.998
University of Greenwich	-0.1353	0.08534	0.1128	-8.48E-06	0.007492	0.9991
Guildhall School of Music and Drama	0.1597	0.1887	0.3971	0.000079	0.007492	0.9916
Harper Adams University	-0.2181	0.1419	0.1245	-0.00015	0.007491	0.9845
University of Hertfordshire	0.4889	0.06435	<.0001	-0.00002	0.007491	0.9983
Heythrop College	0.0944	0.1693	0.5771	0.000143	0.007492	0.9848

University of Huddersfield	0.03566	0.06833	0.6017	0.000084	0.007491	0.9911
University of Hull	-0.09596	0.05958	0.1073	0.000387	0.007489	0.9588
Imperial College London	-0.2378	0.1096	0.0301	-0.00037	0.007484	0.9606
Keele University	-0.09109	0.07529	0.2263	-0.0001	0.007491	0.9895
University of Kent	0.08555	0.05377	0.1116	-0.00007	0.007487	0.9929
King’s College London	-0.2829	0.07228	<.0001	-0.00028	0.007481	0.9699
Kingston University	0.3174	0.06037	<.0001	0.000075	0.007489	0.992
Lancaster University	0.2293	0.0672	0.0006	0.000117	0.007488	0.9875
University of Leeds	0.02933	0.0568	0.6056	0.000372	0.007462	0.9602
Leeds Metropolitan University	-0.114	0.05228	0.0292	0.000306	0.007485	0.9674
Leeds College of Music	-0.1566	0.1532	0.3065	-0.00009	0.007492	0.9906
Leeds Trinity University	-0.3971	0.1189	0.0008	-0.00005	0.007493	0.9945
University of Leicester	0.01187	0.05858	0.8394	-0.0005	0.007488	0.9471
University of Lincoln	0.0631	0.06577	0.3374	0.000016	0.007491	0.9983
University of Liverpool	0.1896	0.05642	0.0008	0.000111	0.007483	0.9881
Liverpool Hope University	0.4996	0.09582	<.0001	0.00002	0.007493	0.9979
Liverpool John Moores University	0.2821	0.05943	<.0001	0.000114	0.00749	0.9879
Liverpool Institute for Performing Arts	-0.03089	0.1701	0.8559	0.00011	0.007493	0.9883
University of the Arts London	-0.1447	0.08424	0.0858	-0.00006	0.007488	0.9937
University College London	0.04466	0.07619	0.5577	-0.00012	0.00748	0.9877
UCL School of Pharmacy	0.2765	0.1558	0.0759	0.00003	0.007493	0.9968
London School of Economics and Political Science	-0.1479	0.1147	0.1974	-0.00022	0.007488	0.9769
London Metropolitan University	-0.2592	0.102	0.0111	-0.00005	0.007492	0.9944
London South Bank University	0.1334	0.1234	0.2798	0.000027	0.007493	0.9972
Loughborough University	-0.1308	0.05571	0.0189	0.00009	0.007476	0.9904
University of Manchester	-0.09317	0.05881	0.1132	0.000597	0.007465	0.9362
Manchester Metropolitan University	0.1734	0.04966	0.0005	0.000316	0.007486	0.9663
Middlesex University	0.447	0.09113	<.0001	0.000201	0.007492	0.9785
Newcastle University	0.166	0.06554	0.0113	-0.00031	0.007474	0.9672

Newman University	-0.1513	0.1296	0.2431	-4.39E-08	0.007493	1
University of Northampton	0.3073	0.08962	0.0006	-0.00009	0.007492	0.9908
Northumbria University Newcastle	0.2187	0.0553	<.0001	-0.00043	0.007483	0.9544
Norwich University of the Arts	-0.1146	0.1521	0.4511	3.08E-06	0.007493	0.9997
University of Nottingham	0.03127	0.06282	0.6187	0.000175	0.007468	0.9813
Nottingham Trent University	-0.113	0.0498	0.0233	-0.00066	0.007484	0.9296
School of Oriental and African Studies	-0.2045	0.1164	0.0788	-0.00022	0.007491	0.9768
University of Oxford	0.262	0.1229	0.0331	0.000704	0.007482	0.925
Oxford Brookes University	0.1337	0.06228	0.0318	-0.00016	0.007479	0.9826
Plymouth University	-0.05772	0.05981	0.3345	-0.00006	0.007488	0.9939
University of Portsmouth	-0.291	0.05272	<.0001	-0.00063	0.007487	0.9331
Queen Mary University of London	-0.1256	0.06071	0.0385	-0.00038	0.007486	0.9597
Ravensbourne	-0.2588	0.1821	0.1554	-0.0001	0.007493	0.9895
University of Reading	-0.09926	0.05674	0.0802	0.000106	0.007482	0.9887
Roehampton University	-0.0662	0.084	0.4306	-3.85E-06	0.007492	0.9996
Rose Bruford College	0.1963	0.177	0.2674	0.000117	0.007493	0.9876
Royal Academy of Music	0.1249	0.2073	0.5467	0.000065	0.007493	0.9931
Royal Agricultural University	-0.1687	0.1588	0.2881	-0.00025	0.007491	0.973
Royal Central School of Speech and Drama	0.2996	0.1701	0.0783	-0.00004	0.007492	0.9952
Royal College of Music	-0.05389	0.2007	0.7883	-0.00005	0.007493	0.9942
Royal Holloway, University of London	-0.1657	0.07513	0.0274	0.000338	0.007486	0.964
Royal Northern College of Music	-0.1129	0.187	0.5462	0.000127	0.007492	0.9865
Royal Veterinary College	0.1429	0.1803	0.4281	-0.00004	0.007493	0.9953
St George’s, University of London	-0.2387	0.1338	0.0744	0.000114	0.007492	0.9878
University of St Mark and St John	-0.3734	0.1364	0.0062	-0.00008	0.007493	0.9912
St Mary’s University, Twickenham	-0.1072	0.1055	0.3097	0.00003	0.007492	0.9968
University of Salford	0.1369	0.07011	0.0508	0.0003	0.007491	0.9681
University of Sheffield	0.1039	0.06057	0.0862	0.000565	0.007479	0.9398
Sheffield Hallam University	0.2682	0.05154	<.0001	0.0004	0.007487	0.9573
University of Southampton	-0.08661	0.0641	0.1766	-0.00057	0.00748	0.9387

Southampton Solent University	-0.2661	0.08102	0.001	0.00004	0.007492	0.9958
Staffordshire University	0.02099	0.07593	0.7822	-0.00019	0.007492	0.9794
Universities of East Anglia and Essex; Joint Provision at University Campus Suffolk	-0.5474	0.1583	0.0005	0	0.007493	1
University of Sunderland	0.3834	0.08801	<.0001	0.000121	0.007492	0.9872
University of Surrey	-0.178	0.06777	0.0086	0.000153	0.007488	0.9837
University of Sussex	0.1327	0.07712	0.0854	-0.00034	0.007487	0.9643
Teesside University	0.04859	0.08711	0.5769	0.000111	0.007492	0.9882
Trinity Laban Conservatoire of Music and Dance	0.009867	0.1804	0.9564	-0.00007	0.007493	0.9926
University of Warwick	0.1753	0.07523	0.0198	0.000157	0.007481	0.9832
University of the West of England, Bristol	0.0296	0.0538	0.5822	-0.00091	0.007481	0.9035
University of West London	0.2641	0.1494	0.0772	-0.00003	0.007493	0.9966
University of Westminster	0.162	0.0673	0.0161	-0.00023	0.00749	0.975
University of Winchester	-0.2402	0.08497	0.0047	-0.00004	0.007492	0.9956
University of Wolverhampton	0.1648	0.08241	0.0455	-0.00006	0.007493	0.9933
University of Worcester	-0.1549	0.1019	0.1286	3.13E-06	0.007493	0.9997
Writtle College	-0.1461	0.1876	0.4361	-2.51E-06	0.007493	0.9997
University of York	-0.06845	0.07541	0.364	-0.00016	0.007485	0.9832
York St John University	-0.06421	0.07804	0.4106	-0.0004	0.007491	0.9577
University of Buckingham	0.08081	0.2023	0.6896	0.000042	0.007493	0.9956

Annex D Model results when only first class degree classification is considered

Table D1 School type effect with simultaneous change in school performance (first class degree classification only)

A-level profile (Best 3)	Mean difference in HE achievement	
	Male	Female
DDD (180 points)	62	50
CDD (200 points)	57	46
CCD (220 points)	51	42
CCC (240 points)	45	37
BCC (260 points)	38	32
BBC (280 points)	32	27
BBB (300 points)	26	22
ABB (320 points)	20	16
AAB (340 points)	14	11
AAA or more (360+ points)	8	6

Table D2 School performance effect – A-level tariff point equivalent for change in chance of getting upper second or higher for 137 Average Level 3 Points Score decrease in school performance

A-level profile (Best 3)	Mean difference in HE achievement	
	Male	Female
DDD (180 points)	4	4
CDD (200 points)	1	3
CCD (220 points)	0	3
CCC (240 points)	0	0
BCC (260 points)	5	-1
BBC (280 points)	3	-1
BBB (300 points)	3	4
ABB (320 points)	1	3
AAB (340 points)	0	3
AAA or more (360+ points)	0	0

Annex E List of abbreviations

APS	Average Point Score
FEC	Further education college
GSA	The Girls' Schools Association
HE	Higher education
HEFCE	Higher Education Funding Council for England
HEI	Higher education institution
HMC	The Headmasters' and Headmistresses' Conference
IDACI	Income Deprivation Affecting Children Index
KS	Key Stage
POLAR	Participation of Local Areas
SOH	The Society of Heads
SPA	Supporting Professionalism in Admissions
Tariff	Capped points score for individuals based on UCAS tariff. See www.ucas.com/how-it-all-works/explore-your-options/entry-requirements/ucas-tariff
UCAS	Formerly the Universities and Colleges Admission Service