February 2005/**09**
Issues paper
This report is for information

This report describes research carried out to determine whether the characteristics of an applicant's school or college can be used in an assessment of his or her potential in higher education. It extends the research carried out in HEFCE 2003/32, 'Schooling effects on higher education achievement'.

Schooling effects on higher education achievement: further analysis – entry at 19

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Schooling effects on higher education achievement: further analysis – entry at 19

To	Heads of publicly-funded higher education institutions in the United Kingdom
Of interest to those responsible for	Student data, Widening participation, Teaching and learning, Planning
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Summary

Purpose

1. This report describes research carried out to determine whether the characteristics of an applicant's school or college can be used in an assessment of his or her potential in higher education (HE). It extends the research carried out in HEFCE 2003/32, 'Schooling effects on higher education achievement'.

Key points

2. In HEFCE 2003/32, we examined whether the school characteristics of an 18 year-old entrant with A-level qualifications to degree courses in 1997-98 can be used to determine his or her potential in HE. This report extends the cohort examined to include 19 year-old entrants.

3. The conclusions of this further analysis are as follows:

   a. As in the previous report, for home full-time A-level students on degree programmes who were 18 years-old in 1997-98 and entered HE in either 1997-98 or 1998-99, we found that the effect of school performance is inconsistent. That is, under certain conditions, students from poorly performing schools are likely to do less well in HE than similar students from better performing schools.

   b. The conclusions regarding the effect of school type are similar to those found in the previous report. That is, students from independent schools appear to consistently do less well than students from other schools and colleges, when compared on a like-for-like basis.

Action required

4. This report is for information.

Introduction

5. In a previous publication, 'Schooling effects on higher education achievement' (HEFCE 2003/32), we examined whether the school characteristics of an 18 year-old entrant with A-level qualifications to degree courses in 1997-98 can be used to determine his or her potential in higher education (HE).

6. We concluded that, after taking into account prior educational achievement, subject of study, and a range of other factors, students from lower performing schools are not expected to do consistently better in HE than similar students from higher performing schools. However, we did find that students from non-independent schools and colleges appeared to do consistently better than students from independent schools, when compared on a like-for-like basis. For all but those students attending the most highly selective HE institutions, the size of this 'school type' effect was equivalent to that which would be associated with one to four A-level points.

7. The study was restricted to 18 year-olds to simplify the analysis. Entry at 19 can be the result of a decision to take a 'gap' year having qualified for entry, or it may follow the need to retake examinations to get the necessary grades, or for other reasons, so that we may expect 19 year-old entrants to be more heterogeneous than those who enter at 18.

8. Restricting the study to 18 year-olds not only limited the scope of our analysis, but also introduced a potential bias in our findings. It is possible that, if students from independent schools had a different propensity to enter at 19, or if they differed in the reasons for their entry at 19, our initial analysis could give a distorted picture. We have now addressed these weaknesses by looking at entry at 19.

Definition and characterisation of 19 year-old entrants

9. The 18 year-old entrants were as in the previous study. The selection was made from records from the 1997-98 HESA student records, which were identified as:

a. English domiciled.

b. English schooled.

c. Full-time.

d. On degree-level courses.

e. At English HEI of entry.

f. A-level taken in 1997.

g. Aged 18 on 31 August 1997.

10. In introducing 19 year-olds, conditions '9a' to '9e' clearly should be maintained. The analysis could be extended in a number of ways. We explored two of them: the age cohort and the starting cohort.

a. For the age cohort, we changed 9f to include those taking A-levels in 1997 and 1998, keeping 9g the same and taking entrants in 1997-98 and 1998-99.

b. For the starting cohort, we changed 9f to include those taking A-levels in 1996 and 1997, and changed 9g to those aged 18 or 19 on 31 August 1997, taking entrants in 1997-98 only.

11. The age and starting cohort approaches both have advantages and disadvantages. In an age cohort approach, most students have taken their A-levels at the same time, that is 1997, and any comparisons made are less prone to changes in A-level grading. The disadvantage is that the students take their degree programmes in different years, and any change in degree classifications would affect the results. Given the trend towards increasing proportions of graduates getting good degrees, this could produce an apparent higher achievement for 19 year-olds.

12. Conversely, the starting cohort approach could be affected by changes to the A-level grading. Given the trend towards increasing A-level grades, this might also be expected to result in the 19 year-olds having a higher HE achievement after allowing for A-level grades. In addition, an analysis based on an entry cohort might be affected by changes in the participation rate, or in the proportion of an age cohort entering at 19. In practice, neither of these factors has changed significantly between 1996-97 and 1997-98.[1]

13. Analysis using the age and starting cohort approaches produced similar results, but, given that the possible distortions of both approaches are likely to be in the same direction, this does not prove that these distortions do not occur. However, there were no major changes to the A-level system for the years in question, and any changes across the whole sector in degree classifications in one year would be small, so it is unlikely that these effects are large. Further, in this report we are not concerned directly with the relative achievement of entrants at the two ages, but only how any such differences might affect our assessment of schooling effects. In reporting our results, we refer to the age cohort analyses. Annex F provides the results of our analyses using a starting cohort approach.

14. As in the previous report, the 18 year-olds are tracked from entry in 1997-98 through to when they qualify or up to 2001- 02, while the 19 year-olds are tracked from entry in 1998-99 up to 2002-03.

15. We separated the 19 year-old students into:

[1] 'Young participation in higher education', HEFCE 2005/03.

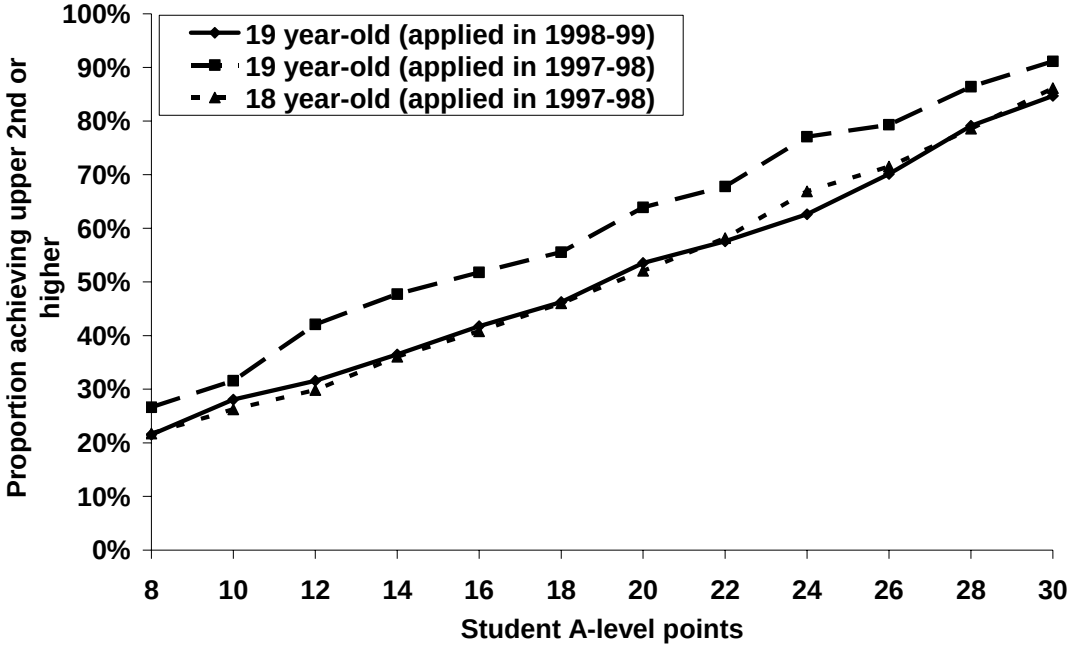
a. Those who are recorded as deferring their entry to HE by one year, that is, they were accepted through UCAS in 1997-98 and started on that course in 1998-99.

b. Those who are recorded as starting on a course in 1998-99, having made a UCAS application for that year.

A-level points of entrants and HE achievement

16. Figure 1 shows the relationship between A-level points and HE achievement (measured by the proportions gaining an upper second or higher) for three student groups: 18 year-old entrants, entrants at 19 who deferred their entry, and entrants at 19 who were accepted in their year of entry.

Figure 1 Proportions achieving an upper second or higher by A-level points



17. For all three entry groups, Figure 1 shows that there is a strong linear relationship between A-level points and proportion achieving an upper second or higher. The most notable feature is that deferred entry students (that is, who applied to UCAS in 1997-98 for entry at 19 years of age in 1998-99) have higher levels of HE achievement compared to the other two groups of students. It is not clear whether there is a causal relationship, and if so what the direction of causality is. It could be that students who take deferred entry are better prepared for HE due to their experiences during the deferred year; or that the decision to defer entry to university is taken by those who are better prepared for HE at the time of the decision.

School performance effects examined through simple summaries

18. Table 1 shows the numbers of 18 year-old entrants, entrants at 19 who deferred their entry, and entrants at 19 who were accepted in their year of entry, split by the performance of the school they attended prior to their university entry. It shows that a higher proportion of our age cohort from the lowest performing school group came into higher education by being accepted through UCAS in 1998-99 (21 per cent), that is, non-deferred 19 year-old entrants. The corresponding figures for the other three school performance groups range from 12 to 14 per cent.

19. The table also shows that, of those 25,907 from the highest performing schools in the age cohort, 2,863 (11 per cent) defer their entry into higher education by a year. This proportion is higher than in the other three school performance groups.

Table 1 Numbers in each school performance group, split by entry age

School performance group	18 year-old		19 year-old accepted in 1997-98		1998-99		Total	
	No.	%	No.	%	No.	%	No.	%
Lowest performing	22,867	75%	1,032	3%	6,473	21%	**30,372**	**100%**
Second group	19,416	81%	1,335	6%	3,240	14%	**23,991**	**100%**
Third group	17,514	82%	1,408	7%	2,537	12%	**21,459**	**100%**
Highest performing	19,354	75%	2,863	11%	3,690	14%	**25,907**	**100%**
All schools and FECs	79,151	78%	6,638	7%	15,940	16%	**101,729**	**100%**

Note: the limits for each group are fixed and are based on those for the performance groups defined in the previous report. The school performance range for the lowest group is 0.6 to 4.8, second group 4.9 to 5.3, third group 5.4 to 6.0 and the highest performing range is 5.8 to 9.

20. For each of the three groups of students, Table 2 shows the median A-level points of students and their associated HE achievement, categorised by the performance level of the school they attended (separated into four quartiles).

Table 2 Schools grouped by performance

School performance group	Median A-level points			Upper 2nd or higher		
	18 year-old	19 year-old Applied in		18 year-old	19 year-old Applied in	
		1997-98	1998-99		1997-98	1998-99
Lowest performing	16	18	16	47%	59%	41%
Second group	18	20	18	51%	65%	47%
Third group	20	22	20	54%	66%	52%
Highest performing	24	24	24	60%	72%	61%
All schools and FECs	20	22	18	53%	67%	49%

Note: equivalent to Table 1 in previous report but split by the three entry groups.

21. Table 2 shows that those 19 year-olds who entered HE in 1998-99 but whose place was allocated through UCAS in the previous year (that is, deferred entry students) have the

highest median A-level points (22 points compared to 20 points for 18 year-olds and 18 points for 19 year-olds who were accepted through UCAS in 1998-99). In all three groups, those attending the highest performing schools have the highest A-level points. The variation in A-level points between students is smallest for deferred entry students.

22. In all three groups, students from the lowest performing schools do least well in HE. The top three groups in terms of HE achievement are the three highest performing groups of deferred students (group achievement rates range from 65 to 72 per cent).

23. Figures A1, A2 and A3 in Annex A show the association between student A-level points and HE achievement for the three entry groups (18 year-olds, 19 year-olds accepted in 1997-98, and 19 year-olds accepted in 1998-99 respectively) split by the performance level of the school they attended.

School type effects examined through simple summaries

24. Table 3 shows the numbers of 18 year-old entrants, entrants at 19 who deferred their entry, and entrants at 19 who were accepted in their year of entry, split by the type of the school they attended prior to their university entry. It shows that 12 per cent of those in the age cohort who entered higher education from independent schools deferred their entry by one year. The corresponding percentages for the other school types are lower.

Table 3 Number in each school type split by entry age

School type	18 year-old		19 year-old accepted in 1997-98		19 year-old accepted in 1998-99		Total	
	No.	%	No.	%	No.	%	No.	%
LEA	30,070	86%	1,873	5%	2,985	9%	**34,928**	**100%**
FEC	22,916	71%	1,534	5%	7,923	24%	**32,373**	**100%**
Grant maintained	13,400	84%	996	6%	1,650	10%	**16,046**	**100%**
Independent	12,765	69%	2,235	12%	3,382	18%	**18,382**	**100%**
All schools and FECs	79,151	78%	6,638	7%	15,940	16%	**101,729**	**100%**

25. Table 4 shows the median A-level points of students and their associated HE achievement, categorised by the type of school that they attended. It shows that deferred entry students have a high level of performance regardless of what type of school they attended. However there is no apparent difference in the performance of deferred students from independent and LEA schools (68 per cent achieve upper seconds or higher), which is not the case for the other two groups (53 against 56 per cent, and 52 against 57 per cent).

Table 4 Schools grouped by type

School type	Median A-level points			Upper 2nd or higher		
	18 year-old	19 year-old Applied in		18 year-old	19 year-old Applied in	
		1997-98	1998-99		1997-98	1998-99
LEA	18	22	18	53%	68%	52%
FEC	18	20	16	50%	66%	43%
Grant maintained	20	22	18	53%	68%	54%
Independent	24	24	22	56%	68%	57%
All schools and FECs	20	22	18	53%	67%	49%

Note: equivalent to Table 2 in previous report but split by the three entry groups.

26. Figures A4, A5 and A6 in Annex A show the association between student A-level points and HE achievement for the three entry groups (18 year-olds, 19 year-olds accepted in 1997-98, and 19 year-olds accepted in 1998-99 respectively) split by the type of school they attended. In general, for all three groups independent schooled students have the lowest rates of HE achievement after allowing for a student's A-levels. In Figures A1-A6, the differences between the four school type groups are more pronounced than the differences between the four school performance groups.

Models of schooling effects

Outline of the modelling approach

27. The approach to the modelling and the presentation of results follows that described in the previous report. We extended this analysis to 19 year-olds in three ways.

28. First, we built separate models for each of the three groups of students: 18 year-old entrants, 19 year-old entrants applying in the year of entry, and other 19 year-old entrants. The 18 year-olds entry group analysis is the same as the previous one, using slightly modified data due to further improvements in data quality. The results of these analyses are given in Annex C.

29. Second, we built a single model, with categorical variables to identify the three entry routes, and interaction variables introduced where appropriate. We can use this single model to identify differences between our three entry groups. This is an updated version of the model used in the previous report, with some interaction terms for the different cohorts. The updated model, the parameters and their estimates for this single model are given in Annex B. Placing the three entry groups into a single model framework means that where there is little information for a particular group, the data of the other two groups can be borrowed to improve estimation where necessary. Using this framework, we can perform similar calculations examining school performance and type effects as carried out in the previous report.

30. Thirdly, we modelled the three entry groups together but ignored any information regarding entry group. This is to explore a particular issue regarding the pattern of entry to higher education which is explained alongside the model results.

Considering each cohort separately

31. For the results of this analysis, see Annex C.

Single model: school performance effects

32. Table 5 shows the school performance effects when the three entry groups of students are placed in a single model framework. The results for each group are similar to the individual modelling results: both 18 year-olds and 19 year-olds who were accepted through UCAS in 1997-98 (deferred entry) have very similar patterns. As in the previous report, we concluded that school performance effects are inconsistent, but the strength and nature of performance effects can vary by entry group.

Table 5 School performance effect when 18 and 19 year-olds are modelled together

Individual student A-level points	18 year-old		19 year-old			
			Applied 1997-98		Applied 1998-99	
	Male	Female	Male	Female	Male	Female
8	3.0	0.5	2.8	-0.2	1.8	-0.9
10	2.7	0.4	2.1	-0.5	1.4	-0.9
12	2.4	0.3	2.0	-0.5	0.9	-0.9
14	2.1	0.1	1.6	-0.7	0.5	-0.9
16	1.9	0.0	1.2	-0.8	0.3	-1.0
18	1.6	-0.1	1.0	-0.9	-0.2	-1.1
20	1.4	-0.2	0.7	-1.0	-0.6	-1.2
22	1.1	-0.3	0.3	-1.2	-1.1	-1.2
24	0.9	-0.4	0.1	-1.3	-1.4	-1.3
26	0.7	-0.5	-0.2	-1.4	-1.8	-1.3
28	0.4	-0.7	-0.4	-1.5	-2.1	-1.3
30	0.2	-0.8	-0.7	-1.7	-2.1	-1.3

Note: equivalent to Table 3 in previous report but split by the three entry groups.

Single model: type of school

33. Table 6 shows the school type effects when the three cohorts of students are placed in a single model framework. For all three entry groups, there is a positive school type effect, meaning that students from LEA schools have higher average achievement in HE compared to their independent schooled counterparts. The single model framework produces slightly different ranges of A-level points for the three cohorts compared to when the cohorts were considered individually.

34. The strength of the effect does not vary significantly by cohort of student but does by gender and individual student A-level points.

Table 6 School type effects with a simultaneous change in school performance when 18 and 19 year-olds are modelled together

Individual student A-level points	18 year-old		19 year-old			
			Applied 1997-98		Applied 1998-99	
	Male	Female	Male	Female	Male	Female
8	6.3	3.9	6.5	3.9	5.7	3.3
10	5.8	3.7	6.1	3.5	5.5	3.1
12	5.4	3.5	5.6	3.1	5.0	3.0
14	5.1	3.3	4.9	2.9	4.7	3.2
16	4.7	3.1	4.5	3.0	4.3	2.9
18	4.3	2.9	4.3	2.9	3.7	2.7
20	4.0	2.7	3.9	2.4	3.6	2.6
22	3.7	2.5	3.4	2.2	3.1	2.1
24	3.4	2.3	3.3	1.9	2.5	2.0
26	3.1	2.1	2.8	1.9	1.9	2.1
28	2.8	1.9	2.8	1.6	1.6	1.8
30	2.5	1.6	2.5	1.3	1.6	1.7

Note: equivalent to Table 5 in previous report but split by the three entry groups.

35. In addition, the parameters of the single model show that there are no significant differences in the school type effects for the three cohorts of students, apart from in one case. A significant difference from the normal pattern is found for 19 year-old grant-maintained students who were accepted through UCAS in 1998-99. These students have slightly higher rates of completion compared to the other two cohorts.

Identification of age cohorts

36. The results of the modelling described above are based on the two age cohorts and three entry routes being separately identified, either through constructing separate models or by introducing identifying variables within a single model. These results have led us to the conclude that the schooling effects for the 19 year-old groups are broadly similar to the previous 18 year-old cohort.

37. Whether or not these approaches are appropriate depends on the underlying assumptions. Under some scenarios it would be possible for an apparent schooling effect to be detected through the different patterns of entry for entrants from different school types. At Annex D, an example is described where misleading conclusions would be drawn about the schooling effect on the overall attainment of 18 and 19 year-olds, from only considering analysis where the different entry routes are identified.

38. It is not possible to determine, from the data, what underlying assumptions do pertain and, therefore, whether the entry routes should be identified. To be confident of our conclusions we therefore need to take both approaches: with and without identifying entry

routes. We have therefore also constructed a single model that does not identify which entry group the student comes from. See Annex E for further details on this model and the inferred school performance and school type effects when the data is considered as a whole, without accounting for entry type.

39. The conclusion of this further analysis is that similar schooling effects are found when entry routes are analysed separately, as reported previously in the analysis of 18 year-olds. The conclusions therefore stand, under a variety of assumptions about the causes of different attainment for different entry groups.

Summary and conclusions

40. The extension of the analysis to include those who enter at 18 and 19 shows broadly the same schooling effects as were found from analysing the 18 year-olds only.

41. For home full-time A-level students on degree programmes who were 18 years-old in 1997-98 and entered HE in either 1997-98 or 1998-99, we found that the school performance effect is inconsistent. That is students from poorly performing schools do not do consistently better than students similar in other respects who went to better performing schools. The strength and nature of the effect can depend on the age on entry, whether or not they are a deferred student, A-level points, and the sex of the student.

42. The effect of school type, however, remained consistent after extending the analysis to 19 year-old entry. On a like-for-like basis, students from independent schools appear to do less well than students from other schools and colleges. The size of the effect can vary depending on the student's profile but is similar for the 18 year-old entrants, 19 year-olds who are accepted through UCAS at 19, and 19 year-olds that are accepted at 18 but enter at 19. The size of the effect is equivalent to that which would be associated with one to five A-level points.

Annex A Figures

The definitions given in the previous report apply in this supplementary report unless otherwise stated.

Figures of student A-level points and HE achievement for differing student profiles

Figure A1 A-level points, school performance and HE achievement for 18 year-old entrants in 1997-98

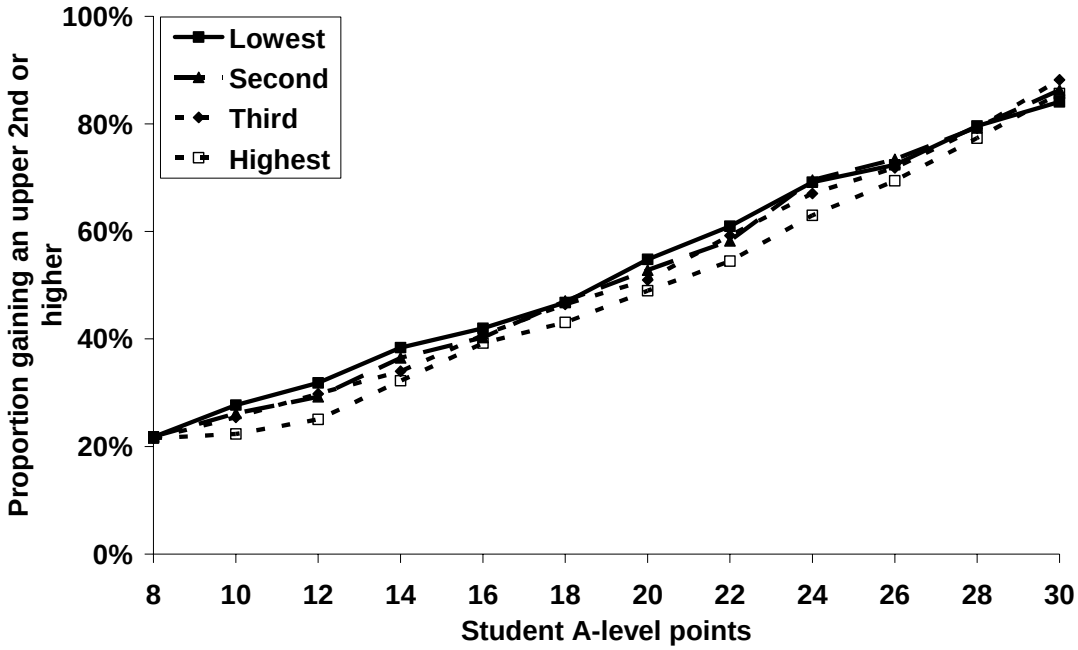


Figure A2 A-level points, school performance and HE achievement for 19 year-old entrants in 1998-99, accepted 1997-98 (deferred entry)

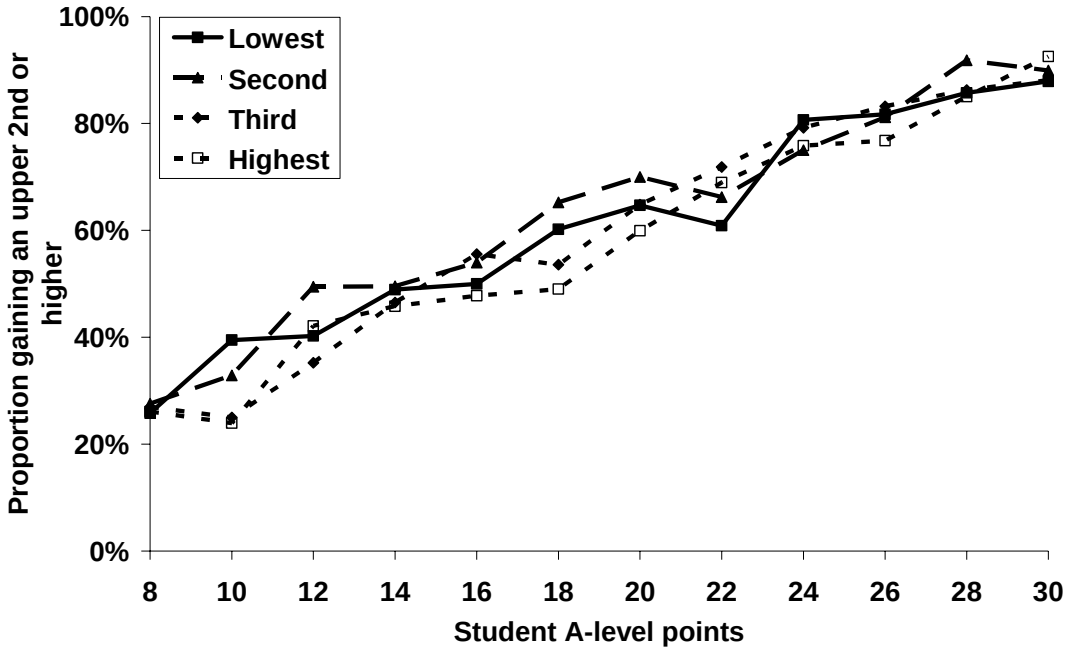


Figure A3 A-level points, school performance and HE achievement for 19 year-old entrants in 1998-99, accepted 1998-99 (non-deferred entry)

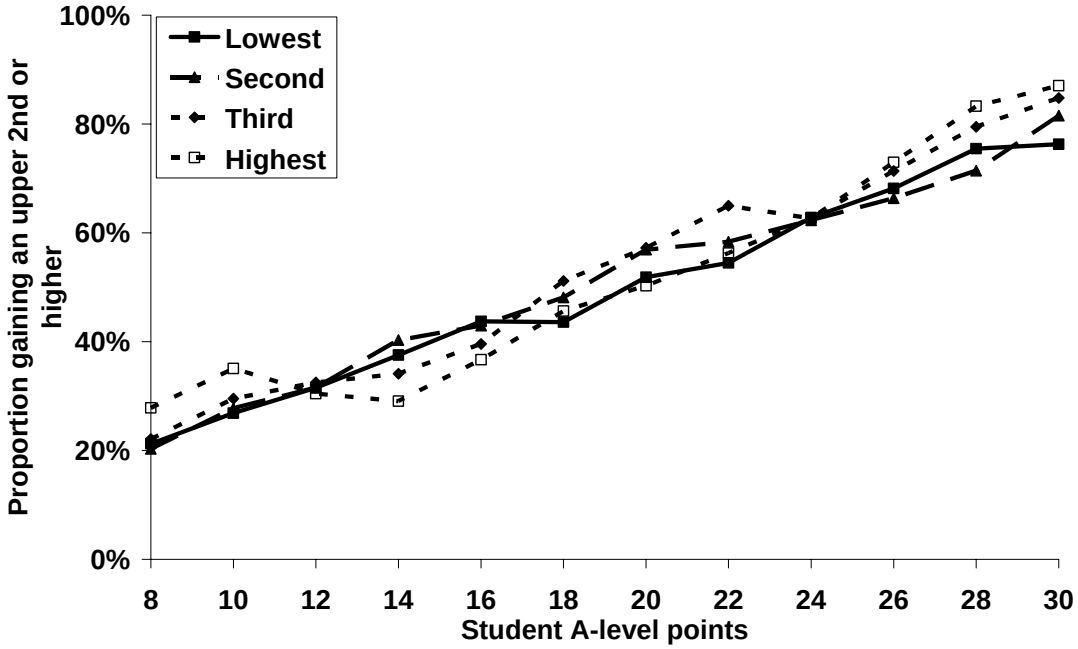


Figure A4 A-level points, school type and HE achievement for 18 year-old entrants in 1997-98

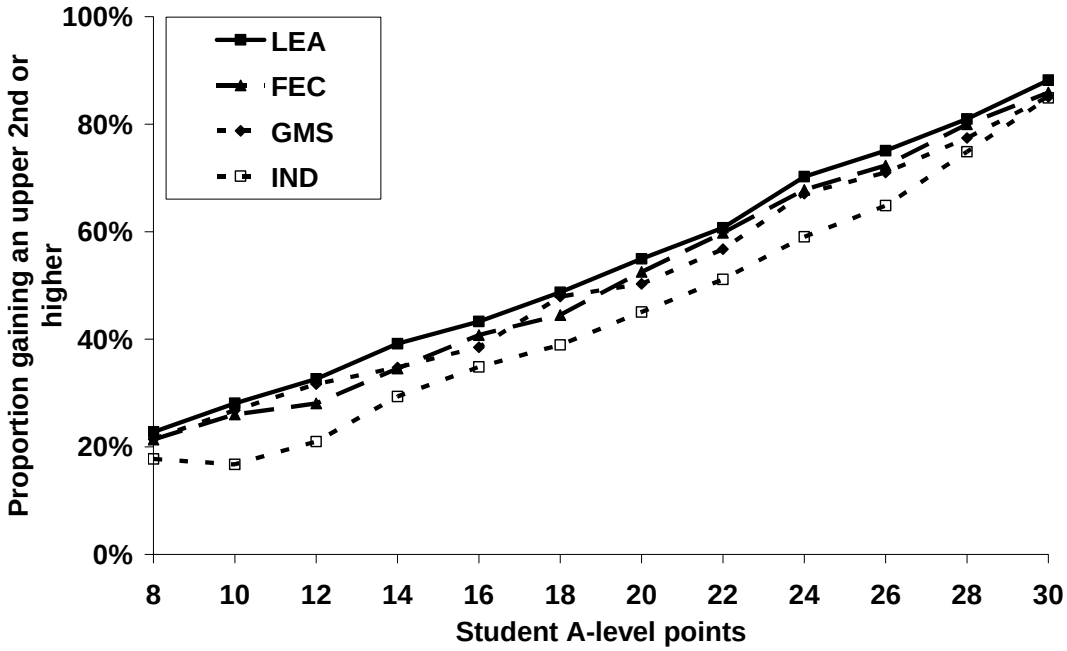


Figure A5 A-level points, school type and HE achievement for 19 year-old entrants in 1998-99, accepted 1997-98 (deferred entry)

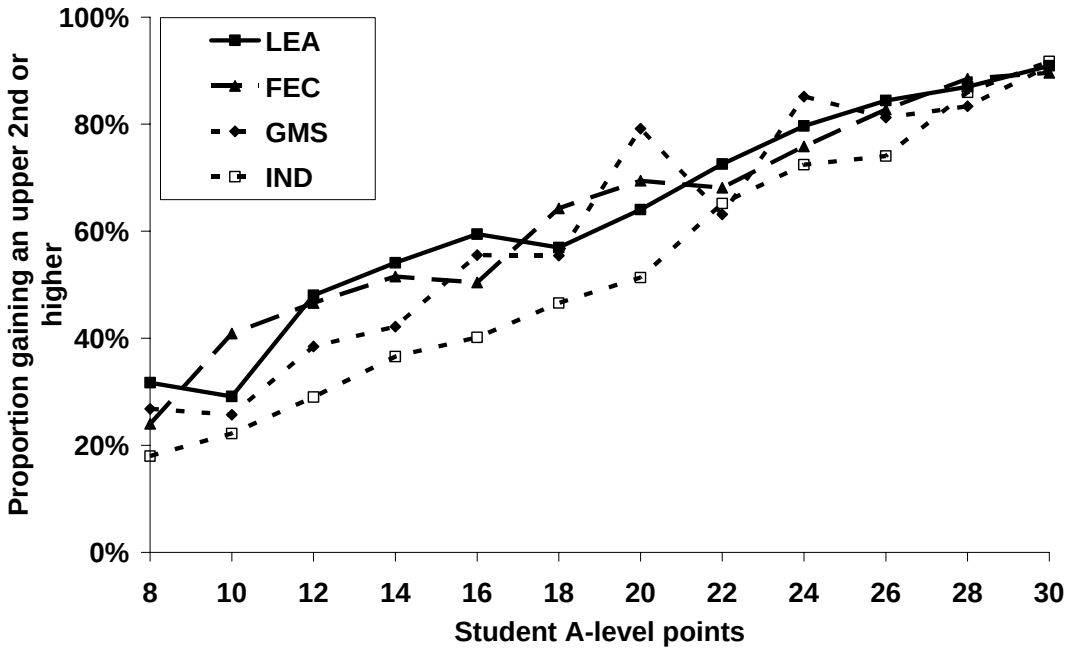
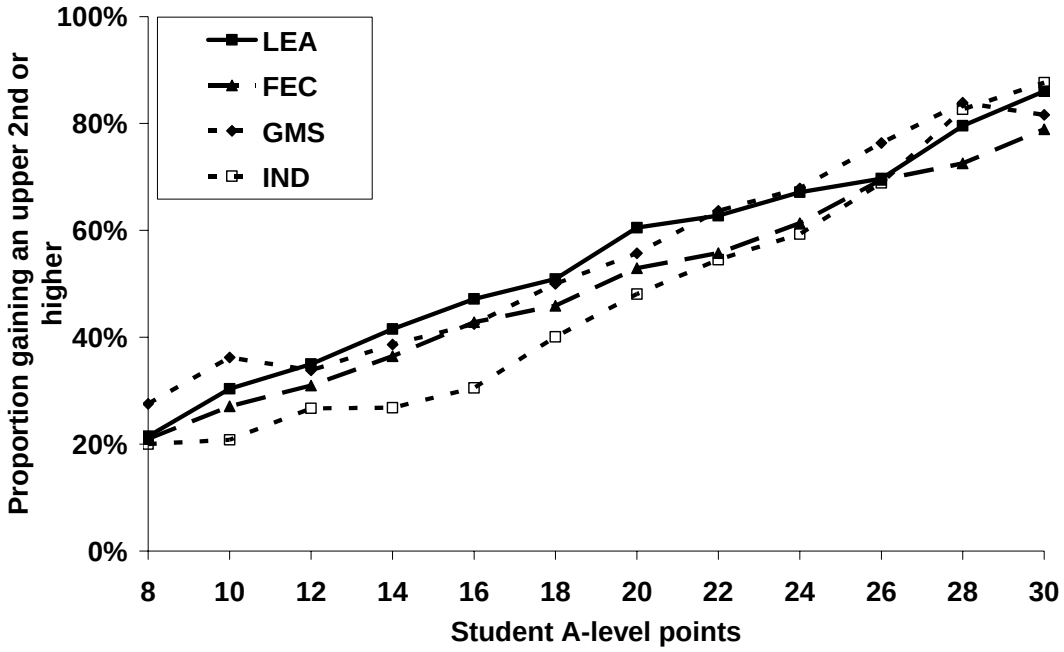


Figure A6 A-level points, school type and HE achievement for 19 year-old entrants in 1998-99, accepted 1998-99 (non-deferred entry)



Annex B Model descriptions

Explanatory variables

1. The explanatory variables for the models in this report are given in Table B1. They are the same as in the previous modelling with two sets of additional variables: one to identify which cohort the student comes from; and whether or not the student achieved 30 A-level points.

Table B1 Explanatory variables for models

Variable type	Explanatory variable	Level	Range / values	Model identifier
Continuous	Student entry qualifications	Individual	(8.0,30.0)	Student Q
	Post-16 school average A-level	School	(0.6,9.0)	School Q
	HEI average A-level points	HEI	(11.1,29.7)	HEI Q
Category	Gender	Individual	Male	Male
			Female	Baseline
	Degree subject area	Individual	Allied to medicine	Sub 1
			Biological/physical sciences	Sub 2
			Agriculture	Sub 3
			Mathematical sciences	Sub 4
			Engineering	Sub 5
			Social studies	Sub 6
			Business	Sub 7
			Languages	Sub 8
			Creative arts	Sub 9
			Education	Sub 10
			Combined studies	Baseline
	All-girls post-16 school attended	School	All girls	All girls
			Not all girls	Baseline
	Degree course length	Individual	3 year degree	Three year
			4 year degree	Baseline
	School type	School	State	LEA
			Further education	FEC
			Grant maintained	GMS
			Independent	Baseline
	School is selective	School	Selective	Selective
			Not selective	Baseline
	Student with highest entry qualifications	Student	Gained 30 A-level points	Highent
			Did not gain 30 A-level points	Baseline
Cohort category	Cohort of student	Cohort	19 year-old deferred entrant	Defer
			19 year-old non-deferred entrant	Current
			18 year-old entrant	Baseline

Individual models for each cohort

2. The model structure and parameters are consistent with those used in the previous schooling effects report. The parameter estimates for each cohort of students for this previous model are given in Table B2.

Table B2 Parameter estimates for the three cohorts based on individual models

Beta	Effect of	18 year-olds		19 year-olds			
				Applied 1997-98		Applied 1998-99	
		Parameter	P-value	Parameter	P-value	Parameter	P-value
β1	The constant	-1.728	0.000	-0.976	0.185	-2.000	0.000
β2	Student A-level points	0.111	0.000	0.053	0.114	0.089	0.000
β3	School average A-level points	-0.100	0.002	-0.176	0.150	-0.028	0.633
β4	HEI average A-level points	-0.012	0.003	0.009	0.533	0.002	0.799
β5	Being male	0.641	0.012	-0.699	0.440	0.958	0.023
β6	Studying subjects allied to medicine	1.100	0.000	-0.950	0.339	-0.164	0.661
β7	Studying biological or physical sciences	-0.135	0.013	-0.124	0.542	-0.387	0.003
β8	Studying agriculture	0.457	0.000	0.290	0.296	-0.082	0.686
β9	Studying mathematical sciences	0.440	0.000	0.162	0.710	0.346	0.154
β10	Studying engineering	1.282	0.000	0.231	0.766	-0.579	0.341
β11	Studying social studies	-0.120	0.000	-0.023	0.819	-0.204	0.002
β12	Studying business	0.345	0.000	0.185	0.553	0.148	0.408
β13	Studying languages	-0.641	0.000	-0.998	0.002	-0.918	0.000
β14	Studying creative arts	-0.241	0.088	-0.695	0.251	0.130	0.526
β15	Studying education	0.036	0.416	-0.311	0.035	-0.016	0.867
β16	Attending an all-girls school	0.144	0.001	0.057	0.679	0.131	0.180
β17	Being on a three-year course	-0.794	0.000	-1.021	0.000	-0.738	0.000
β18	Attending a state-school post-16	0.358	0.000	0.652	0.000	0.536	0.000
β19	Attending an FEC post-16	0.205	0.000	0.588	0.000	0.318	0.000
β20	Attending a grant-maintained school post-16	0.396	0.000	0.468	0.094	0.756	0.000
β21	Attending a selective school	-0.083	0.008	0.087	0.419	0.023	0.772
β22	(Additional) student A-level points combined with school A-level points	0.006	0.000	0.012	0.036	0.005	0.076
β23	(Additional) student A-level points on males	-0.030	0.016	0.011	0.803	-0.069	0.002
β24	(Additional) student A-level points crossed by school A-level points on males	0.007	0.002	-0.001	0.863	0.012	0.004
β25	(Additional) student A-level points for subjects allied to medicine	-0.026	0.000	-0.004	0.898	-0.010	0.455
β26	(Additional) student A-level points for mathematical sciences	-0.039	0.000	-0.049	0.005	-0.041	0.000
β27	(Additional) student A-level points for engineering	-0.064	0.000	-0.057	0.086	0.016	0.605

β28	(Additional) student A-level points for business	-0.011	0.013	-0.003	0.866	-0.007	0.469
β29	(Additional) student A-level points for languages	0.023	0.000	0.056	0.000	0.039	0.000
β30	(Additional) student A-level points for males studying engineering	0.032	0.017	0.037	0.312	-0.019	0.586
β31	(Additional) student A-level points for grant maintained post-16	-0.008	0.013	0.004	0.746	-0.011	0.223
β32	(Additional) school A-level points for males	-0.245	0.000	-0.014	0.931	-0.287	0.001
β33	(Additional) school A-level points for subjects allied to medicine	-0.104	0.005	0.134	0.376	0.046	0.458
β34	(Additional) being male and studying biology/physics	-0.186	0.000	-0.266	0.090	-0.098	0.338
β35	(Additional) being male and studying mathematical sciences	0.128	0.059	0.471	0.095	0.199	0.241
β36	(Additional) being male and studying engineering	-0.867	0.002	-0.046	0.957	0.643	0.332
β37	(Additional) being male and studying languages	0.214	0.000	0.079	0.637	0.178	0.111
β38	(Additional) being male and studying creative arts	0.252	0.005	0.710	0.022	0.413	0.001
β39	(Additional) attending an all-girls state-school post-16	-0.125	0.033	-0.279	0.217	-0.087	0.628
β40	(Additional) being on a three-year course and studying biology/physics	0.259	0.000	0.228	0.226	0.353	0.004
β41	(Additional) being on a three-year course and studying languages	0.281	0.000	0.060	0.729	0.250	0.052
β42	(Additional) being on a three-year course and studying creative arts	0.404	0.004	1.005	0.099	0.129	0.524
β43	(Additional) HEI A-level points on those on a three-year course	0.026	0.000	0.042	0.004	0.032	0.001

Single model framework

3. The single model framework is given below.

$$\left.\begin{aligned} \text{firstup}_{ijk} &\sim \text{Binomial}(\text{denom}_{ijk}, \pi_{ijk}) \\ \text{firstup}_{ijk} &= \pi_{ijk} + e_{0ijk}\text{bcons}^{*} \end{aligned}\right\}$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = {} & \beta_1\text{cons}_{ijk} + \beta_2\text{studq}_{ijk} + \beta_3\text{schoolq}_{ijk} + \beta_4\text{instq}_{ijk} + \beta_5\text{male}_{ijk} + \beta_6\text{sub1}_{ijk} + \beta_7\text{sub2}_{ijk} + \\ & \beta_8\text{sub3}_{ijk} + \beta_9\text{sub4}_{ijk} + \beta_{10}\text{sub5}_{ijk} + \beta_{11}\text{sub6}_{ijk} + \beta_{12}\text{sub7}_{ijk} + \beta_{13}\text{sub8}_{ijk} + \beta_{14}\text{sub9}_{ijk} + \\ & \beta_{15}\text{sub10}_{ijk} + \beta_{16}\text{sgen2}_{ijk} + \beta_{17}\text{threeyr}_{ijk} + \beta_{18}\text{lea}_{ijk} + \beta_{19}\text{fec}_{ijk} + \beta_{20}\text{gms}_{ijk} + \beta_{21}\text{select}_{ijk} + \\ & \beta_{22}\text{schoolq.studq}_{ijk} + \beta_{23}\text{male*studq}_{ijk} + \beta_{24}\text{male*schoolq*studq}_{ijk} + \beta_{25}\text{sub1*studq}_{ijk} + \\ & \beta_{26}\text{sub4*studq}_{ijk} + \beta_{27}\text{sub5*studq}_{ijk} + \beta_{28}\text{blank1}_{k} + \beta_{29}\text{sub8*studq}_{ijk} + \beta_{30}\text{sub5*male*studq}_{ijk} + \\ & \beta_{31}\text{blank2}_{k} + \beta_{32}\text{male*schoolq}_{ijk} + \beta_{33}\text{sub1*schoolq}_{ijk} + \beta_{34}\text{sub2*male}_{ijk} + \beta_{35}\text{blank3}_{k} + \\ & \beta_{36}\text{sub5*male}_{ijk} + \beta_{37}\text{sub8*male}_{ijk} + \beta_{38}\text{sub9*male}_{ijk} + \beta_{39}\text{sgen2*lea}_{ijk} + \beta_{40}\text{sub2*threeyr}_{ijk} + \\ & \beta_{41}\text{sub8*threeyr}_{ijk} + \beta_{42}\text{sub9*threeyr}_{ijk} + \beta_{43}\text{threeyr*instq}_{ijk} + \beta_{44}\text{highent}_{ijk} + \\ & \beta_{45}\text{instq*instq*instq*instq}_{ijk} + \beta_{46}\text{instq*highent}_{ijk} + \beta_{47}\text{instq*instq}_{ijk} + \beta_{48}\text{instq*instq*highent}_{ijk} + \\ & \beta_{49}\text{instq*instq*instq}_{ijk} + \beta_{50}\text{lea*instq}_{ijk} + \beta_{51}\text{fec*instq}_{ijk} + \beta_{52}\text{gms*instq}_{ijk} + \beta_{53}\text{male*highent}_{ijk} + \\ & \beta_{54}\text{sub2*schoolq}_{ijk} + \beta_{55}\text{sub4*schoolq}_{ijk} + \beta_{56}\text{sub5*schoolq}_{ijk} + \beta_{57}\text{sub6*schoolq}_{ijk} + \\ & \beta_{58}\text{sub7*schoolq}_{ijk} + \beta_{59}\text{sub4*male*studq}_{ijk} + \beta_{60}\text{sub10*studq}_{ijk} + \beta_{61}\text{sub3*studq}_{ijk} + \\ & \beta_{62}\text{sub9*studq}_{ijk} + \beta_{63}\text{sub10*threeyr}_{ijk} + \beta_{64}\text{sub4*highent}_{ijk} + \beta_{65}\text{sub5*threeyr}_{ijk} + \\ & \beta_{66}\text{instq*instq*instq*instq*current}_{ijk} + \beta_{67}\text{instq*instq*instq*current}_{ijk} + \\ & \beta_{68}\text{current*male*schoolq*studq}_{ijk} + \beta_{69}\text{current}_{ijk} + \beta_{70}\text{current.instq}_{ijk} + \\ & \beta_{71}\text{instq*instq*current}_{ijk} + \beta_{72}\text{male.current}_{ijk} + \beta_{73}\text{current.gms}_{ijk} + \beta_{74}\text{current.schoolq}_{ijk} + \\ & \beta_{75}\text{sub1*schoolq*current}_{ijk} + \beta_{76}\text{sub6*schoolq*current}_{ijk} + \beta_{77}\text{current*male*studq}_{ijk} + \\ & \beta_{78}\text{current.schoolq.studq}_{ijk} + \beta_{79}\text{current.sub1}_{ijk} + \beta_{80}\text{current.sub2}_{ijk} + \beta_{81}\text{current.sub3}_{ijk} + \\ & \beta_{82}\text{current.sub6}_{ijk} + \beta_{83}\text{current.sub7}_{ijk} + \beta_{84}\text{current.threeyr}_{ijk} + \beta_{85}\text{deferred}_{ijk} + \\ & \beta_{86}\text{deferred.instq}_{ijk} + \beta_{87}\text{male.deferred}_{ijk} + \beta_{88}\text{sub5*male*deferred}_{ijk} + \beta_{89}\text{deferred.schoolq}_{ijk} + \\ & \beta_{90}\text{deferred.studq}_{ijk} + \beta_{91}\text{sub10*studq*deferred}_{ijk} + \beta_{92}\text{sub5*studq*deferred}_{ijk} + \\ & \beta_{93}\text{deferred.sub6}_{ijk} + \beta_{94}\text{deferred.sub9}_{ijk} \end{aligned}$$

$$\text{bcons}^{*} = \text{bcons}[\pi_{ijk}(1 - \pi_{ijk})/\text{denom}_{ijk}]^{0.5}$$

$$\left[e_{0ijk}\right] \sim (0,\ \Omega_e) \ :\ \Omega_e = \left[1\right]$$

4. The associated parameter descriptions, estimates and p-values (indicating significance levels) are given in Table B3.

Table B3 Parameter estimates for the single model framework

Beta	Effect of	Parameter	P-value
β1	The constant	0.593	0.813
β2	Student A-level points	0.118	0.000
β3	School average A-level points	-0.036	0.247
β4	HEI average A-level points	-0.692	0.186
β5	Being male	0.311	0.159
β6	Studying subjects allied to medicine	1.050	0.000
β7	Studying biological or physical sciences	0.109	0.312
β8	Studying agriculture	-0.334	0.217
β9	Studying mathematical sciences	1.015	0.000

β10	Studying engineering	1.200	0.000
β11	Studying social studies	-0.050	0.664
β12	Studying business	0.409	0.001
β13	Studying languages	-0.683	0.000
β14	Studying creative arts	0.144	0.330
β15	Studying education	0.011	0.923
β16	Attending an all-girls school	0.144	0.000
β17	Being on a three-year course	-0.825	0.000
β18	Attending a state-school post-16	0.722	0.000
β19	Attending a FEC post-16	0.494	0.000
β20	Attending a grant-maintained school post-16	0.681	0.000
β21	Attending a selective school	-0.052	0.064
β22	(Additional) student A-level points combined with school A-level points	0.004	0.008
β23	(Additional) student A-level points on males	-0.019	0.080
β24	(Additional) student A-level points crossed by school A-level points on males	0.003	0.083
β25	(Additional) student A-level points for subjects allied to medicine	-0.020	0.001
β26	(Additional) student A-level points for mathematical sciences	-0.051	0.000
β27	(Additional) student A-level points for engineering	-0.050	0.000
β29	(Additional) student A-level points for languages	0.024	0.000
β30	(Additional) student A-level points for males studying engineering	0.028	0.018
β32	(Additional) school A-level points for males	-0.158	0.000
β33	(Additional) school A-level points for subjects allied to medicine	-0.117	0.001
β34	(Additional) being male and studying biology/physics	-0.158	0.000
β36	(Additional) being male and studying engineering	-0.662	0.006
β37	(Additional) being male and studying languages	0.216	0.000
β38	(Additional) being male and studying creative arts	0.351	0.000
β39	(Additional) attending an all-girls state-school post-16	-0.134	0.012
β40	(Additional) being on a three-year course and studying biology/physics	0.319	0.000
β41	(Additional) being on a three-year course and studying languages	0.313	0.000
β42	(Additional) being on a three-year course and studying creative arts	0.380	0.001
β43	(Additional) HEI A-level points on those on a three-year course	0.026	0.000
β44	(Additional) students with 30 A-level points	-4.800	0.000
β45	(Additional) HEI A-level points to the power 4	0.000	0.089
β46	(Additional) HEI A-level points for students with 30 A-level points	0.397	0.000
β47	(Additional) HEI A-level points squared	0.060	0.138
β48	(Additional) HEI A-level points squared for students with 30 A-level points	-0.008	0.000
β49	(Additional) HEI A-level points cubed	-0.002	0.107
β50	(Additional) HEI A-level points for those attending a state school	-0.016	0.003
β51	(Additional) HEI A-level points for those attending a FEC	-0.012	0.035
β52	(Additional) HEI A-level points for those attending a grant-maintained school	-0.020	0.001
β53	(Additional) males with 30 A-level points	0.237	0.001
β54	(Additional) school A-level points for biology/physics	-0.054	0.003
β55	(Additional) school A-level points for mathematical sciences	-0.082	0.001
β56	(Additional) school A-level points for engineering	-0.065	0.022
β57	(Additional) school A-level points for social studies	-0.010	0.621
β58	(Additional) school A-level points for business	-0.049	0.024
β59	(Additional) student A-level points for males studying mathematical sciences	0.009	0.004
β60	(Additional) student A-level points for education	-0.004	0.488
β61	(Additional) student A-level points for agriculture	0.049	0.003
β62	(Additional) student A-level points for creative arts	-0.019	0.001
β63	(Additional) being on a three-year course and studying education	0.222	0.001
β64	(Additional) mathematical sciences students with 30 A-level points	0.231	0.021
β65	(Additional) being on a three-year course and studying engineering	0.175	0.006
β66	(Additional) HEI A-level points to the power 4 for 19 year-old non-deferred	0.000	0.204
β67	(Additional) HEI A-level points cubed for 19 year-old non-deferred	0.003	0.281
β68	(Additional) student and school A-level points for 19 y-o non-deferred males	0.003	0.012
β69	Being a 19 year-old 1998-99 entrant, UCAS 1998-99 (non-deferred)	-1.976	0.677
β70	(Additional) HEI A-level points for 19 year-old non-deferred	0.627	0.536
β71	(Additional) HEI A-level points squared for 19 year-old non-deferred	-0.068	0.393

β72	(Additional) being male and a 19 year-old non-deferred	0.187	0.121
β73	(Additional) attending a grant-maintained school and being 19 year-old non-deferred	0.189	0.002
β74	(Additional) school A-level points for 19 year-old non-deferred	0.078	0.009
β75	(Additional) school A-level points for subjects allied to medicine and 19 year-old non-deferred	0.179	0.010
β76	(Additional) school A-level points for social studies and 19 year-old non-deferred	0.092	0.022
β77	(Additional) student A-level points for 19 year-old non-deferred males	-0.034	0.001
β78	(Additional) student A-level points and school A-level points for 19 year-old non-deferred	-0.003	0.005
β79	(Additional) studying subjects allied to medicine for 19 year-old non-deferred	-1.103	0.003
β80	(Additional) studying biology/physics for 19 year-old non-deferred	-0.178	0.001
β81	(Additional) studying agriculture for 19 year-old non-deferred	-0.501	0.024
β82	(Additional) studying social studies for 19 year-old non-deferred	-0.599	0.006
β83	(Additional) studying business for 19 year-old non-deferred	-0.140	0.026
β84	(Additional) being on a three year course and 19 year-old non-deferred	0.154	0.001
β85	Being a 19 year-old 1998-99 entrant, UCAS 1997-98 (deferred)	0.040	0.809
β86	(Additional) HEI A-level points for 19 year-old deferred	0.026	0.004
β87	(Additional) being male and a 19 year-old deferred	-0.144	0.017
β88	(Additional) studying engineering for 19 year-old deferred males	0.638	0.003
β89	(Additional) school A-level points for 19 year-old deferred	0.047	0.068
β90	(Additional) student A-level points for 19 year-old deferred	-0.013	0.055
β91	(Additional) student A-level points for education and 19 year-old deferred	-0.020	0.007
β92	(Additional) student A-level points for engineering and 19 year-old deferred	-0.032	0.000
β93	(Additional) studying social studies for 19 year-old deferred	0.115	0.144
β94	(Additional) studying creative arts for 19 year-old deferred	0.292	0.060

Annex C Results when cohorts modelled individually

1. Table C1 shows, for 18 year-old entrants in 1997-98, the school performance effects expected for a decrease in school performance of one A-level grade or two points (based on the definitions from the previous report). It provides the A-level point equivalent for an increased chance of getting an upper second or better. The average effects are tabulated by individual A-level points and by sex. The proportion of students in each group who are expected to have a positive school performance effect is also shown. It is an updated version of Table C1 from the previous report.

Table C1 School performance effect – A-level point equivalent for increased chance of getting an upper second or better for decrease of two points in school performance

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	3.8	100%	0.8	100%
10	3.3	100%	0.7	100%
12	2.8	100%	0.5	100%
14	2.4	100%	0.3	100%
16	2.0	100%	0.1	6%
18	1.6	100%	-0.1	7%
20	1.2	100%	-0.2	8%
22	0.8	100%	-0.4	8%
24	0.4	100%	-0.6	8%
26	0.0	3%	-0.8	6%
28	-0.4	2%	-1.0	5%
30	-0.8	1%	-1.2	3%

Note: equivalent to Table 3 in previous report.

2. Table C2 is the associated school type table and shows the difference in expected HE achievement between students from independent and LEA schools for entrants who were 18 in 1997-98, assuming an appropriate change in school performance depending on school type. It is an updated version of Table 5 from the previous report.

Table C2 School type effect with simultaneous change in school performance for 18 year-old entrants in 1997-98

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	5.3	99%	3.1	100%
10	4.8	99%	2.8	100%
12	4.4	100%	2.7	100%
14	4.0	100%	2.5	100%
16	3.7	100%	2.3	100%
18	3.4	100%	2.2	100%
20	3.0	100%	2.0	100%
22	2.7	100%	1.9	100%
24	2.5	100%	1.8	100%
26	2.2	100%	1.7	100%
28	2.0	100%	1.5	99%
30	1.8	100%	1.4	97%

Note: equivalent to Table 5 in previous report.

3. The equivalent Tables 3 and 4 for 19 year-old 1998-99 entrants who made a UCAS application for 1998-99 entry are given in Tables C3 and C4 respectively.

Table C3 School performance effect for 19 year-old entrants in 1998-99, UCAS accepted 1998-99

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		**Female**	
low (5 - 8)	4.3	100%	-0.3	0%
10	3.1	100%	-0.5	0%
12	2.4	100%	-0.7	0%
14	1.6	100%	-0.9	0%
16	0.8	98%	-1.1	0%
18	0.0	96%	-1.2	0%
20	-0.7	0%	-1.4	0%
22	-1.4	0%	-1.6	0%
24	-2.0	0%	-1.8	0%
26	-2.6	0%	-1.9	0%
28	-3.0	0%	-2.0	0%
30	-3.3	0%	-2.1	0%

Note: equivalent to Table 3 in previous report but for 19 year-old non-deferred entrants.

Table C4 School type effect with simultaneous change in school performance for 19 year-old entrants in 1998-99, UCAS accepted 1998-99

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	6.4	100%	4.0	100%
10	6.0	100%	3.7	100%
12	5.5	100%	3.6	100%
14	5.0	100%	3.6	100%
16	4.5	100%	3.4	100%
18	4.0	100%	3.2	100%
20	3.7	100%	3.1	100%
22	3.2	100%	2.9	100%
24	2.8	98%	2.8	100%
26	2.5	95%	2.9	99%
28	2.3	90%	2.6	98%
30	2.0	82%	2.7	99%

Note: equivalent to Table 5 in previous report but for 19 year-old non-deferred entrants.

4. The equivalent Tables 5 and 6 for 19 year-olds who made a UCAS application for 1997-98 entry and deferred their entry until 1998-99 are given in Tables C5 and C6 respectively.

Table C5 School performance effect for 19 year-old entrants in 1998-99, UCAS accepted 1997-98

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	2.0	98%	1.4	96%
10	1.5	98%	0.9	98%
12	1.1	98%	0.4	96%
14	0.7	99%	0.0	96%
16	0.3	100%	-0.4	0%
18	-0.1	0%	-0.9	0%
20	-0.5	0%	-1.2	0%
22	-0.8	0%	-1.6	0%
24	-1.2	0%	-1.9	0%
26	-1.4	0%	-2.3	0%
28	-1.8	0%	-2.5	0%
30	-2.1	0%	-2.8	0%

Note: equivalent to Table 3 in previous report but for 19 year-old deferred entrants.

Table C6 School type effect with simultaneous change in school performance for 19 year-old entrants in 1998-99, UCAS accepted 1997-98

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	7.0	100%	5.7	100%
10	6.5	100%	5.1	100%
12	6.0	100%	4.8	100%
14	5.3	100%	4.3	100%
16	5.1	100%	4.1	100%
18	4.9	100%	4.0	100%
20	4.6	100%	3.4	100%
22	4.1	100%	3.1	99%
24	4.1	100%	2.8	98%
26	3.6	99%	2.7	97%
28	3.5	100%	2.5	96%
30	3.5	100%	2.3	92%

Note: equivalent to Table 5 in previous report but for 19 year-old deferred entrants.

5. School performance Tables C1, C3 and C5 show that, for all three cohorts, a reduction in school performance does not necessarily lead to an expected increase in student HE achievement. For some groups of students, a reduction in school performance always produces an expected reduction in HE achievement, for example, for 1998-99 UCAS female applicants who enter in 1998-99 regardless of individual A-level points.

6. For all three cohorts, school performance effects on HE achievement are very different for males and females. Generally the performance effect is more negative for females.

7. For both 18 and 19 year-old students, school performance effects are inconsistent. Under a significant number of conditions, students from poorly performing schools are likely to do less well in HE than similar students from better performing schools. This outcome becomes more likely for females and/or 19 year-old entrants.

8. School type Tables C2, C4 and C6 show there are similar patterns of HE achievement for all three groups of students based on school type. Students from LEA schools have higher average HE achievement compared to their independent schooled counterparts. The school type effect is generally lower for females than males, and for students with higher A-level points.

9. The school type effects appear larger for the two 19 year-old cohorts. For the previous 18 year-old cohort, the school type effect can range from two to five points for males, and from one to three points for females.

10. The equivalent ranges are slightly higher for 19 year-old students entering in 1998-99 who made their UCAS application for 1998-99: three to seven points for males; and three to four for females.

11. Some of the largest school type effects are seen for those 19 year-old entrants who deferred their entry into HE. The effect for males is never less than around three and a half points for any set of A-level points.

Annex D Should different entry groups be identified?

1. In order to describe how different approaches may be appropriate, depending on the underlying causal model, we used an artificial and simplified example. In both the scenarios considered, 2,000 students make up the cohort. 1,000 of these students attend an independent school and 1,000 attend a state school. All students included in these data have the same A-level grades and other measurable characteristics, apart from their school type and age of entry. For simplicity, all the 19 year-old entrants are deferred entrants.

2. We also introduce the idea of an index of higher education potential which ranges from 0.000 for the student with the lowest potential to 0.999 for the student with the highest potential. This unmeasured variable determines HE achievement.

3. Because all the students are similar in all respects apart from school type and age of entry, we can discuss the results in terms of a simple cross-tabulation without recourse to a model. The results are shown in table D1 below.

Table D1 Illustrative example: HE outcome results

	State schools		Independent schools		
	Number of entrants	Mean HE potential score	Number of entrants	Mean HE potential score	HE achievement outcome
18 year-old	900	0.45	800	0.4	State higher achievement
19 year-old	100	0.95	200	0.9	State higher achievement
Overall	1,000	0.5	1,000	0.5	Equal achievement

Scenario 1: Deferred entry leads to improved HE attainment

4. In this scenario, all state school entrants at the age of 18 have an HE potential score of 0.450, and all independent school entrants have a potential of 0.400. However, by entering at 19, all students, from both state and independent schools, raise their potential by 0.500.

5. Under this scenario it would seem most appropriate to consider the 18 year-old and 19 year-old entrants separately. The combined result is an example of Simpson's Paradox

where there is a reversal, or in this case removal, of the direction of an association when data from several groups are combined to form a single group[2].

Scenario 2: Age of entry identifies students with potential

6. In this scenario both state and independent students have an HE potential score which ranges from 0.000 for the student with the lowest potential to 0.999 for the student with the highest potential. For each and every independent school student there is a corresponding state school student with equal higher education potential.

7. In this scenario the students with the highest potential enter at 19, though entry at 19 does not affect potential. The top 20 per cent (in terms of potential) of independent school students delay their entry into higher education until they are 19. The top 10 per cent of state school students make the same decision. The remaining students enter higher education at 18.

8. By design, we know that the distribution and size of potential for independent and state school students is identical. However if we consider only the 18 year-olds from the age cohort who enter higher education directly, an incorrect conclusion could be drawn regarding their potential. On average the independent school students will have a potential of 0.400 (800 students, potential ranging from 0.000 to 0.799). The state school students will have an average potential of 0.450 (900 students, potential ranging from 0.000 to 0.899). The conclusion drawn would be that 18 year-old independent school students entering higher education have lower potential than their 18 year-old state school counterparts. This conclusion is correct when considering 18 year-olds with each other, as more of the higher parts of the state school potential distribution are contained in the 18 year-old state school entrants.

9. If the analysis is repeated for 19 year-olds only, a similar conclusion would be drawn. The average potential for independent school students is 0.900 and for state school students it is 0.950.

10. So considering the two age groups separately, both show a positive potential towards state schools. However we know, through design, that when the data are considered together there is no difference in the potentials of the two school types.

[2] Moore, D. and McCabe, G. 'Introduction to the practice of statistics', p190.

Annex E Model when the data are considered as a whole, ignoring entry group

1. The model structure and parameters are consistent with those used in the previous schooling effects reports. The parameter estimates for each cohort of students for this previous model are given in Table E1.

2. The model does not include any terms involving entry group, which allows us to test for effects regarding combining results from separate analysis.

Table E1 Parameter estimates for the whole age cohort, ignoring entry group

Beta	Effect of	Parameter	P-value
β1	The constant	-1.741	0.000
β2	Student A-level points	0.101	0.000
β3	School average A-level points	-0.089	0.001
β4	HEI average A-level points	-0.007	0.057
β5	Being male	0.607	0.004
β6	Studying subjects allied to medicine	0.720	0.000
β7	Studying biological or physical sciences	-0.186	0.000
β8	Studying agriculture	0.358	0.000
β9	Studying mathematical sciences	0.384	0.000
β10	Studying engineering	0.985	0.000
β11	Studying social studies	-0.121	0.000
β12	Studying business	0.302	0.000
β13	Studying languages	-0.710	0.000
β14	Studying creative arts	-0.190	0.094
β15	Studying education	0.006	0.869
β16	Attending an all-girls school	0.116	0.002
β17	Being on a three-year course	-0.785	0.000
β18	Attending a state-school post-16	0.377	0.000
β19	Attending an FEC post-16	0.221	0.000
β20	Attending a grant-maintained school post-16	0.421	0.000
β21	Attending a selective school	-0.073	0.009
β22	(Additional) student A-level points combined with school A-level points	0.007	0.000
β23	(Additional) student A-level points on males	-0.034	0.001
β24	(Additional) student A-level points crossed by school A-level points on males	0.007	0.000
β25	(Additional) student A-level points for subjects allied to medicine	-0.025	0.000
β26	(Additional) student A-level points for mathematical sciences	-0.039	0.000
β27	(Additional) student A-level points for engineering	-0.056	0.000
β28	(Additional) student A-level points for business	-0.010	0.011
β29	(Additional) student A-level points for languages	0.027	0.000
β30	(Additional) student A-level points for males studying engineering	0.031	0.008
β31	(Additional) student A-level points for grant maintained post-16	-0.008	0.011
β32	(Additional) school A-level points for males	-0.233	0.000
β33	(Additional) school A-level points for subjects allied to medicine	-0.051	0.093
β34	(Additional) being male and studying biology/physics	-0.169	0.000
β35	(Additional) being male and studying mathematical sciences	0.162	0.008
β36	(Additional) being male and studying engineering	-0.670	0.005
β37	(Additional) being male and studying languages	0.213	0.000

β38	(Additional) being male and studying creative arts	0.335	0.000
β39	(Additional) attending an all-girls state-school post-16	-0.121	0.024
β40	(Additional) being on a three-year course and studying biology/physics	0.278	0.000
β41	(Additional) being on a three-year course and studying languages	0.267	0.000
β42	(Additional) being on a three-year course and studying creative arts	0.399	0.000
β43	(Additional) HEI A-level points on those on a three-year course	0.027	0.000

3. Table E2 shows, considering both 18 and 19 year-old entrants together, the school performance effects expected for a decrease in school performance of one A-level grade or two points (based on the definitions from the previous report). It provides the A-level point equivalent for an increased chance of getting an upper second or better. The average effects are tabulated by individual A-level points and by sex. The proportion of students in each group who are expected to have a positive school performance effect is also shown.

Table E2 School performance effect – A-level point equivalent for increased chance of getting an upper second or better for decrease of two points in school performance

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	3.6	100%	0.6	100%
10	3.1	100%	0.4	100%
12	2.6	100%	0.2	100%
14	2.1	100%	-0.1	5%
16	1.6	100%	-0.3	6%
18	1.1	100%	-0.5	6%
20	0.6	100%	-0.6	8%
22	0.2	100%	-0.8	0%
24	-0.2	4%	-1.0	0%
26	-0.7	3%	-1.2	0%
28	-1.1	0%	-1.4	0%
30	-1.5	0%	-1.6	0%

Note: equivalent to Table 3 in previous report but examining all three entry groups together.

4. Table E3 is the associated school type table and shows the difference in expected HE achievement between students from independent and LEA schools for entrants, considering 18 and 19 year-olds together, assuming an appropriate change in school performance depending on school type.

Table E3 School type effect with simultaneous change in school performance

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 - 8)	5.2	99%	3.0	100%
10	4.7	100%	2.8	100%
12	4.3	100%	2.6	100%
14	3.9	100%	2.4	100%
16	3.5	100%	2.2	100%
18	3.1	100%	2.0	100%
20	2.8	100%	1.9	100%
22	2.5	100%	1.8	100%
24	2.2	100%	1.6	99%
26	1.9	100%	1.5	98%
28	1.7	100%	1.4	94%
30	1.5	95%	1.3	91%

Note: equivalent to Table 5 in previous report but examining all three entry groups together.

Annex F Tables using a starting cohort for 1997-98 rather than an age cohort

All tables in this annex provide results from using a starting cohort rather than an age cohort. Table references provide the associated age cohort table from this report.

Table F1 Numbers in each school performance group split by entry age

School performance group	18 year-old		19 year-old accepted in 1996-97		19 year-old accepted in 1997-98		Total	
	No.	%	No.	%	No.	%	No.	%
Lowest performing	22,867	69%	1,690	5%	8,788	26%	**33,345**	**100%**
Second group	19,416	84%	1,106	5%	2,707	12%	**23,229**	**100%**
Third group	17,514	82%	1,446	7%	2,498	12%	**21,458**	**100%**
Highest performing	19,354	74%	3,024	12%	3,864	15%	**26,242**	**100%**
All schools and FECs	79,151	76%	7,266	7%	17,857	17%	**104,274**	**100%**

Reference: Table 1.

Table F2 Schools grouped by performance

School performance group	Median A-level points			Upper 2nd or higher		
	18 year-old	19 year-old Applied in 1997-98	19 year-old Applied in 1998-99	18 year-old	19 year-old Applied in 1997-98	19 year-old Applied in 1998-99
Lowest performing	16	18	14	47%	57%	39%
Second group	18	20	16	51%	61%	44%
Third group	20	20	18	54%	64%	48%
Highest performing	24	24	22	60%	68%	58%
All schools and FECs	20	22	18	53%	63%	45%

Reference: Table 2.

Table F3 Number in each school type split by entry age

School type	18 year-old		19 year-old accepted in 1996-97		19 year-old accepted in 1997-98		Total	
	No.	%	No.	%	No.	%	No.	%
LEA	30,070	84%	2,079	6%	3,445	10%	**35,594**	**100%**
FEC	22,916	68%	1,710	5%	9,122	27%	**33,748**	**100%**
Grant maintained	13,400	83%	1,112	7%	1,664	10%	**16,176**	**100%**
Independent	12,765	68%	2,365	13%	3,628	19%	**18,758**	**100%**
All schools and FECs	79,151	76%	7,266	7%	17,859	17%	**104,276**	**100%**

Reference: Table 3.

Table F4 Schools grouped by type

School Type	Median A-level points			Upper 2nd or higher		
	18 year-old	19 year-old Applied in		18 year-old	19 year-old Applied in	
		1997-98	1998-99		1997-98	1998-99
LEA	18	20	16	53%	63%	49%
FEC	18	20	16	50%	62%	40%
Grant maintained	20	20	18	53%	62%	48%
Independent	24	24	22	56%	66%	53%
All schools and FECs	20	22	18	53%	63%	45%

Reference: Table 4.

Table F5 School performance effect when 18 and 19 year-olds are modelled together

Individual student A-level points	18 year-old		19 year-old			
			Accepted 1996-97		Accepted 1997-98	
	Male	Female	Male	Female	Male	Female
8	3.2	0.5	3.2	0.5	0.8	-1.6
10	2.9	0.4	2.8	0.3	0.4	-1.6
12	2.5	0.3	2.4	0.2	0.0	-1.6
14	2.3	0.1	2.0	0.0	-0.3	-1.6
16	2.0	0.0	1.7	0.0	-0.6	-1.6
18	1.7	-0.1	1.4	-0.1	-0.9	-1.6
20	1.4	-0.1	1.2	-0.3	-1.2	-1.5
22	1.2	-0.2	0.9	-0.4	-1.4	-1.6
24	0.9	-0.4	0.6	-0.5	-1.7	-1.6
26	0.7	-0.5	0.4	-0.7	-1.9	-1.5
28	0.4	-0.6	0.2	-0.8	-2.2	-1.7
30	0.2	-0.7	0.0	-0.8	-2.4	-1.7

Reference: Table 5.

Table F6 School type effects with a simultaneous change in school performance when 18 and 19 year-olds are modelled together

Individual student A-level points	18 year-old		19 year-old			
			Accepted 1996-97		Accepted 1997-98	
	Male	Female	Male	Female	Male	Female
8	6.3	3.9	6.1	3.8	5.6	3.3
10	5.8	3.6	6.0	3.5	5.4	3.1
12	5.4	3.5	5.5	3.1	4.9	2.9
14	5.1	3.3	4.7	2.9	4.6	3.2
16	4.7	3.1	4.4	3.1	4.1	2.8
18	4.3	2.9	4.2	2.8	3.6	2.7
20	4.0	2.7	3.8	2.4	3.4	2.6
22	3.7	2.5	3.2	2.2	2.9	2.1
24	3.4	2.3	3.3	2.0	2.3	1.9
26	3.0	2.1	2.7	1.9	1.8	2.1
28	2.8	1.9	2.8	1.6	1.5	1.8
30	2.5	1.6	2.4	1.4	1.4	1.7

Reference: Table 6.

Table F7 School performance effect – A-level point equivalent for increased chance of getting an upper second or better for decrease of two points in school performance

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 – 8)	3.0	100%	0.3	100%
10	2.5	100%	0.1	100%
12	2.1	100%	0.0	6%
14	1.7	100%	-0.2	5%
16	1.3	100%	-0.4	6%
18	0.9	100%	-0.5	7%
20	0.5	100%	-0.7	8%
22	0.1	100%	-0.8	0%
24	-0.2	4%	-1.0	0%
26	-0.6	3%	-1.2	0%
28	-1.0	0%	-1.3	0%
30	-1.3	0%	-1.5	0%

Reference: Table E2.

Table F8 School type effect with simultaneous change in school performance

Individual student A-level points	Mean increase in HE achievement Percentage of students increasing achievement			
	Male		Female	
low (5 – 8)	4.8	100%	2.7	100%
10	4.3	100%	2.5	100%
12	3.9	100%	2.4	100%
14	3.6	100%	2.2	100%
16	3.3	100%	2.1	100%
18	3.0	100%	1.9	100%
20	2.7	100%	1.8	100%
22	2.4	100%	1.8	100%
24	2.2	100%	1.6	99%
26	1.9	100%	1.5	98%
28	1.7	100%	1.4	96%
30	1.6	98%	1.4	93%

Reference: Table E3.