WORKING PAPER

Two Bs or Not...?
Schools' and Colleges' A-level Performance

The Audit Commission for Local Authorities and the National Health Service in England and Wales
PREFACE

In Spring of this year, the Audit Commission and Her Majesty's Inspectorate of Schools (HMI) began a joint study of education provision for 16 to 19 year olds, with the intention of publishing a report in late 1992. One of the aims of the study is to develop a methodology for evaluating the overall effectiveness of different institutions in educating this age group.

As part of its contribution to the study, the Audit Commission commissioned research from the Qualitative and Quantitative Studies in Education (QQSE) Research Group of Sheffield University. The work was undertaken by David Jesson and Professor John Gray. In view of the considerable current interest in schools' and further education colleges' performance, the Audit Commission has decided to publish the QQSE work now to give people an opportunity to contribute to the development of the work.

This report is of work-in-progress. Further work during the course of the study is planned to develop the approaches described, and this may add to or modify the findings presented here.

The Audit Commission would welcome comments on and criticism of this paper. More generally, contributions would be welcome to the development of methods for assessing value-added on vocational courses and on the incorporation of outcomes not currently covered by qualifications. Please send any comments to Steve Evans or James Kennedy of the Directorate of Local Government Studies at:

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SUMMARY

Education is about more than examination results, but examination achievements are one of the primary outputs of education. So it is not surprising that attention should be focused on them, especially in the 16-19 phase of education, because almost all students who stay on do so to secure qualifications. To date, most of the published information about examination results has presented raw results, such as the percentage of A-levels achieved at grades A and B. But there has been some controversy about the validity of conclusions drawn from such information in indicating the effectiveness of schools and colleges.

In particular, it is argued that individual sixth forms and colleges differ in the educational attainments of their intakes of students, and thus should be compared on the basis of the progress made by students, which will reflect the 'value added' by their education. But no generally accepted robust methods for measuring value added have yet been established. This paper presents the interim results of some work-in-progress towards the development of a value-added approach to assessing A-level performance.

For A-levels, the value-added approach involves comparing the examination results of students at age 18 at a particular institution with examination results of the same students at age 16, to see what progress has been made. For example, a school whose intake of students into the sixth form had poor GCSE grades, and where A-level achievements were modest, would nonetheless be ranked as achieving high 'value-added' if the A-level results were higher than might be expected from the standard of the intake.

Analyses based on data on 1721 young people who took A-levels in the summer of 1988 show entrants to tertiary colleges, sixth form colleges and sixth forms in publicly maintained schools having on average broadly similar GCSE qualifications; those in independent schools' sixth forms have significantly better qualifications and those in colleges of further education which are not tertiary are less well-qualified. So any attempt to compare A-level performance by type of institution ought to take prior differences in attainment into account.

Examination performance at GCSE (or its previous equivalents) at age 16 is by far the most important predictor of A-level performance. Two other factors make a small but consistent difference. Starting with the same 16+ examination achievements, males do marginally better than females at A-level and young people whose parents are graduates do marginally better than those whose parents are non-graduates.

No single type of institution appears consistently more effective at A-levels than the others, when full account is taken of differences in the examination qualifications of their intakes at age 16+ (Exhibit 1, overleaf). The higher A-level achievements of independent schools' pupils appear to be explained by their higher than average GCSE qualifications. There are likely to be significant differences between the performances of individual schools, but analysis of a larger base of data is needed to gauge the extent of these differences and the reasons for them. (It should be noted that the current data cannot be used to draw conclusions about the effectiveness of different types of schools in preparing pupils for GCSE.)

This research is still in progress, but it holds out the promise of developing robust 'value added' methods for comparing courses, whole institutions and types of institution. The Audit Commission would welcome comments on this paper.
Exhibit 1
THE EFFECT OF INSTITUTION TYPE ON A-LEVEL PERFORMANCE

There is little to choose between types of institution after taking account of the different examination qualifications of their intakes.

A Level achievement (average UCCA points score*)

Source: YCS 1987 Cohort
* See Appendix 1 for the scoring system
INTRODUCTION
1. Recent changes in legislation are leading to the development of something akin to a market in publicly maintained education (Exhibit 2). Formula funding means that student numbers are the main factor determining the size of schools' and further education colleges' budgets. This encourages schools and colleges to compete with one another for students.

Exhibit 2
PRESSURES ON MAINTAINED EDUCATIONAL INSTITUTIONS TO COMPETE
There are several pressures on schools and colleges to compete

2. At the same time, open enrolment gives students and parents greater freedom of choice. As they exercise that freedom, students and parents will be keen to secure as much relevant information about schools' and colleges' performance as they can find.

3. Schools and sixth form colleges have been required to publish information on their pupils' examination attainment since the 1980 Education Act. The requirements have recently been updated and the Government plans to apply similar requirements to further education colleges. Comparative information on all schools is to be collected and published locally.

4. These steps are intended to help parents exercise choice, but there is considerable controversy about the validity of conclusions drawn from the raw information.

5. Partial league tables of schools based on their A-level examination results have already begun to be published. While some regard this as an entirely positive development, others are less sure. Two main criticisms are advanced. First, that examination results do not describe the full impact a school or college makes on a student's development, and that exclusive concentration on them will distort priorities for teaching and learning. The second criticism is more technical in nature. It is argued that simple tables of A-level results fail to take into account the educational standards of the students when they entered the school or college. Of the two students in the table overleaf, student 1 appears to have gained more from A-level study, although student 2 obtained better A-level grades.
Table
EXAMINATION GRADES OF TWO FICTIONAL STUDENTS

<table>
<thead>
<tr>
<th></th>
<th>GCSE grades</th>
<th>A-level grades two years later</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>C E C C</td>
<td>D D</td>
</tr>
<tr>
<td>Student 2</td>
<td>A A B A A</td>
<td>C C</td>
</tr>
</tbody>
</table>

6. The first criticism is certainly valid. There are outcomes of 16-19 education which many people would regard as desirable but which currently are only partially examined or not examined at all, including, for example, personal and interpersonal skills, integrity and positive attitudes to change (identified by the CBI in Towards a Skills Revolution* as important aims for education). It may be argued that if there are significant aspects of attainment not assessed in current qualifications, there is a case for widening the scope of qualifications. But that is outside the scope of this paper.

7. The second criticism may, on the other hand, be addressed through analysis. For example, a comparison of students' achievements at A-level compared with their achievements at GCSE shows the progress made by the students, or, put another way, the 'value added' by the sixth form course (Exhibit 3).

Exhibit 3
THE CONCEPT OF VALUE ADDED
Student 2 has better A level results than student 1 but has made less impressive progress

8. 'Value-added' methodologies are being investigated in a collaborative study of education provision for 16 to 19 year olds being undertaken by the Audit Commission and HMI (Schools). The study team is undertaking extensive fieldwork in educational institutions and in the

* See appendix 1 for the scoring system

education departments of local education authorities (LEAs) looking at management arrangements, costs, quality and standards of teaching as well as comparing students' certified achievements before and after their post-16 courses. Data on certified achievements are to be used to develop methods for describing the 'value added' by individual institutions and courses. The intention is that 'value added' should be only one of a number of indicators used to assess an institution, since it is acknowledged that any assessment defined in terms of qualifications is constrained by the scope of the qualifications themselves.

9. To complement the fieldwork, the Audit Commission commissioned research from the Qualitative and Quantitative Studies in Education (QQSE) Research Group of the University of Sheffield Division of Education. The work was undertaken by David Jesson and Professor John Gray, and was based on data drawn from the third cohort of the Youth Cohort Study of England and Wales. This data-set is now available for public analysis. The Youth Cohort Study is funded by the Department of Employment Group and the Department of Education and Science. The analysis presented here, however, is the responsibility of David Jesson and Professor John Gray, and the views and interpretations are the responsibility of the Audit Commission.

RESEARCH METHODOLOGY

10. The study of A-levels dominates the current debate about schools' and colleges' performance in educating the 16-19 age group, although there is another debate about how A-levels and vocational qualifications should relate to each other. The main Audit Commission/HMI study is also examining performance in vocational qualifications such as those offered by the Business and Technician Education Council (BTEC), the City and Guilds of London Institute and the Royal Society of Arts (RSA).

11. The aim of the work commissioned from QQSE was to establish whether there exists a sufficiently close relationship between students' A-level and earlier examination achievements at the end of year 11* to make a 'value added' approach meaningful. This requires that A-levels build on achievement at the end of year 11, rather than depend on skills wholly unconnected with those needed for year 11 examinations. In other words, the value added approach relies upon there being a statistical correlation between an individual's A-level results and his/her results at end of year 11. The QQSE work also aimed to identify factors outside the control of a school or college which influence performance at A-level.

12. The data for the analyses were drawn from the Youth Cohort Study of England and Wales. By means of postal surveys, this follows the experiences of education, training and employment of young people as they pass through the networks of 16-19 provision and enter higher education or the world of work (Exhibit 4, overleaf). The Youth Cohort Study has been financed since its inception in 1984 by the Department of Education and Science (DES) and by (what is now) the Department of Employment Group.

* Secondary schools have tended to designate year-groups up to compulsory attendance age by reference to the number of years students will have attended secondary school at the end of the school year in question. Thus the final year of compulsory attendance (during which a pupil's 16th birthday takes place) has been referred to as the fifth year, and subsequent years are spent in the sixth form. It is becoming more common to designate year groups by the nomenclature which the DES promulgated after the 1988 Education Reform Act became law. Under this nomenclature the final year of compulsory attendance is year 11 (Y11).
Exhibit 4
CHOICES CONFRONTING YOUNG ADULTS AT 16
There is considerable choice of routes open to 16-year-olds

16-year-old

Employment
Youth Training
Vocational Courses

18.

Pre-vocational Courses
A-levels
GCSEs

College of further education
(possibly tertiary)
VI form college
Previous school’s sixth form
Other school sixth form

Note: only the main options are shown.

13. National samples of young people are followed up about six months after they are first in a position to leave school if they wish, and then again at two further twelve-month intervals. The analysis in this paper is based on data from the third cohort (21,000 young people). Response rates of 77%, 76% and 76% to the three successive surveys of the cohort yielded full information on 9,328 of them. Data on the key characteristics of the initial population from which the sample was drawn allow differential non-response to be taken into account. 1721 (18.4%) embarked on a course aiming for at least two A-levels and actually took at least one A-level in or before the summer of 1988, two years after they were first in a position to leave school, in the summer of 1986 (fuller details about the conduct of the surveys are available in Ref. 1). Table 1 in Appendix 1 gives details of the sample size, which is large enough to support the main conclusions in this study. However the data cannot support or refute some other conclusions which might be suggested by the reported results because the numbers of students in the relevant categories may be too small. Nor do the data provide evidence on variation in rates of completion of courses. Data from a fourth cohort, who took A-levels in the Summer of 1998, will shortly become available for comparison.

THE PATTERN OF A-LEVEL PROVISION

14. A variety of institutions offer A-levels. Almost half the students in the sample were studying in maintained secondary schools with sixth forms. In most cases these were the same schools in which young people had taken their year 11 examinations. A quarter of the sample were studying in independent schools, a much higher proportion than the independent schools’ overall share of education provision for pupils of all ages. The remaining quarter were to be found in maintained sixth form colleges, tertiary colleges and other colleges of further education (Exhibit 5).

* These are commonly referred to as ‘state’ schools and colleges.
Exhibit 5
STUDENTS IN EACH TYPE OF INSTITUTION
Maintained secondary schools have more A-level students than any other type of institution

Source: YCS 1987 Cohort

THE YEAR 11 QUALIFICATIONS OF A-LEVEL ENTRANTS

15. There are no formal entry requirements for studying A-level, but in every type of institution the considerable majority of those embarking on A-level study had four or more high grade passes (a 'high grade' pass is defined as an A to C grade at O-level, or latterly GCSE, or a CSE grade 1) (Exhibit 6). Indeed, in four of the five types of institution more than half the entrants had seven or more high grades, but qualifications of entrants to non-tertiary colleges of further education were more evenly spread, with just under a third possessing only one to three

Exhibit 6
YEAR 11 QUALIFICATIONS OF A-LEVEL ENTRANTS
A considerable majority of those starting A-level courses have 4 or more high grade passes at GCSE or its equivalent

Source: YCS 1987 Cohort
high grade passes. Some of these students, of course, had other examination objectives in addition to A-level.

16. To give a fuller picture of young people’s examination achievements a ‘year 11 (Y11) examination points score’ was used. This score takes account both of the quantity and quality of young people’s achievements (for details see Appendix 1) but it is only one of a number of possible ways of measuring Y11 examination achievement.

17. The overall distribution of Y11 examination attainments of entrants to maintained secondary school sixth forms, to sixth form colleges and to tertiary colleges was similar, with all levels of year 11 attainment represented. Students at independent schools were already significantly better-qualified, however, whilst those in colleges of further education other than tertiary colleges were significantly less well-qualified at this stage (Exhibit 7). It is possible that independent schools enter their pupils for more GCSEs than do maintained schools, and this may, in part, account for the generally higher Y11 examination score in independent schools.

Exhibit 7
QUALIFICATIONS ON ENTRY TO A-LEVELS
Students at independent schools have significantly better year 11 qualifications than those in the maintained sector

<table>
<thead>
<tr>
<th>% of Students</th>
<th>Independent school</th>
<th>Maintained secondary</th>
<th>VI Form college</th>
<th>Tertiary college</th>
<th>F E college (not tertiary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 11 Examination Points Score*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-30</td>
<td>41-50</td>
<td>Above 60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>51-60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: YCS 1987 Cohort
* See Appendix 1 for the scoring system

18. Thus different types of post-16 institution are currently catering for groups of young people with different Y11 qualifications. The role of colleges of further education which are not tertiary colleges is especially distinctive in this respect. So any attempt to compare A-level performances ought to take these prior differences in attainment into account.

STUDYING A-LEVELS

19. In general, examination performance at the end of year 11 influenced the average number of A-levels for which a young person was entered (Exhibit 8) and the influence was similar in different types of institution – similarly qualified young people took on similar numbers of A-levels in each of the types of institution. The best-qualified entered almost twice as many
The best qualified students enter almost twice as many A-levels as the least well-qualified.

Note: The A-level totals include results in General Studies
Source: YCS 1987 Cohort
A-levels as the least well-qualified, although the least well-qualified often combined their A-level subjects with preparation for other examinations (not taken into account in this analysis).

COMPARISON OF RESULTS AT A-LEVEL

20. There are several ways in which success at A-level can be measured, none of which is universally recognised. A common one is the UCCA points score system which is employed by universities and other higher education institutions to assess the overall qualifications of their applicants (see Appendix 1 for fuller details).

21. Three different ways of looking at A-level success were considered:
   --- the total number of UCCA points a young person obtained;
   --- the number of A-level passes (counting all grades from A to E, including grades for General Studies); and
   --- the average number of UCCA points achieved for each subject entered.

22. A statistical technique based on regression analysis was used to examine more closely what factors might explain performance at A-level. The factors considered were:
   --- type of institution attended
   --- Y11 examination performance
   --- gender
   --- parental education (specifically, whether the student's parents were graduates or non-graduates)
   --- parental social class
   --- ethnic background
   --- housing tenure.
This list does not exhaust the whole range of factors which might influence young people's performance at A-level. It is based on the factors on which data have been collected regularly since 1984 in the various Youth Cohort Studies and which have been found, in previous work by the QQSE Group, to be significantly associated with differences in performance. It should be borne in mind that the YCS surveys collect information on many aspects of young people's experiences and that consequently the amount of space in YCS questionnaires devoted to this kind of information from young people is limited. Further research might identify some other important factors which should be taken into account.

23. Appendix 2 presents the regression analysis results. The analysis shows that on average the better a young person's Y11 qualifications, the better his or her A-level performance (Exhibits 9 and 10). The best-qualified on leaving Y11 were averaging UCCA scores of 12 or above (equivalent to three 'B' passes) whilst the least well-qualified averaged scores of 2 or 3 points (equivalent to two or three 'E' passes). It should be borne in mind that the regression equation attempts to find the 'best fit' for the data-points across the whole range.

24. The statistical procedure first identifies which of various postulated factors is the best predictor of A-level performance; it also considers each of the others, in turn, to see whether they improve the prediction of A-level performance still further. When the procedure has chosen a second predictor, it looks at all the remaining factors to see if they, in turn, can contribute to the prediction further still. It goes on selecting factors in this way until the last chosen factor fails to make a statistically significant contribution to improving the prediction. In the analyses reported here, while Y11 examination performance was the most important predictor of A-level performance, two other factors made a small but consistent difference (Exhibit 10). Males did marginally better at A-levels than females with the same Y11 examination score and young people whose parents were graduates did marginally better than those whose parents were non-graduates.

Exhibit 9
A-LEVEL SCORE OBTAINED COMPARED WITH YEAR 11 EXAMINATION SCORE
Success at A-level correlates well with achievement at year 11 examinations

<table>
<thead>
<tr>
<th>Average UCCA Points Score</th>
<th>Year 11 Examination Points Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-30</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
</tr>
<tr>
<td></td>
<td>Above 60</td>
</tr>
</tbody>
</table>

Source: YCS 1987 Cohort
Exhibit 10
PREDICTING STUDENTS’ UCCA POINTS SCORES
Regression lines can provide a benchmark for a student’s UCCA points score based on the year 11 examination score and other factors.

Source: YCS 1987 Cohort

For example those males who had Y11 examination scores of 50 points and who came from graduate families subsequently went on to obtain average UCCA scores of just under 9 points. For females from graduate families the average UCCA scores were reduced by 0.8 of a point to 8.2. (The gender effect contrasts with the gender difference in Y11 examinations, where males do less well than females – see for example Ref. 2.)

25. Appendix 2 presents the corresponding analyses for the two other measures of A-level success: the number of passes achieved and the average number of UCCA points per entry, a measure which reflects the ‘quality’ of the passes obtained.

26. Young people whose UCCA scores fell below the appropriate line in Exhibit 10 could be said to have done worse than would have been predicted from knowledge of their previous performance, whilst those above it could be said to have done better. It should be stressed that very few young people’s scores will fall exactly on the line; most tend to cluster around it and differences of this kind are to be expected. But a number of young people obtain scores considerably above or below the line.

27. Do young people attending certain types of post-16 institution tend to obtain results above the prediction line (i.e. to do better) compared with those attending other types of institution? This question was tackled using a procedure which, in essence, takes all the data for young people attending one type of institution (say sixth form colleges) and establishes the overall relationship, just for them, between their Y11 scores and subsequent UCCA scores. Then it compares the line that it has constructed for this group with the national line already drawn in on Exhibit 10. The exercise is then repeated four times, for the maintained secondaries, the independent schools, the tertiary colleges and the other colleges of further education. A more sophisticated statistical procedure, known as multi-level modelling, used in an exploratory investigation, gave broadly similar results (Ref. 3 and 4).
28. The results showed small differences in the lines estimated for each type of post-16 institution — but none of the differences was of sufficient statistical significance to merit separate inclusion. Taking account of the different examination qualifications of their intakes, no particular type of institution stood out as being especially effective or ineffective. No one type of institution appears to have been uniformly more effective across the board for each of the five groups of Y11 examination score (Exhibit 1). Where one type of institution appears to be doing better for a particular group, this is because the estimate is based on small numbers of cases and the differences are statistically non-significant.

29. Further analyses using multi-level models were undertaken to see whether the particular institution attended had a strong influence on A-level performance. This analysis was restricted to those students who attended the same school post-16 as they had attended pre-16. Unfortunately, with over 600 schools represented in the sample, the numbers of students per school were too small to draw firm conclusions. The indications were however, that some schools do provide their students with a 'competitive edge'. More research is required in this area. Other research (Reference 5) suggests that differences between departments within institutions may also be important.

CONCLUSION

30. Setting students' A-level results against the year 11 results of the same students sheds a useful light on A-level performance. It also holds out the promise of 'value added' methods for comparing courses, institutions and types of institution, allowing questions to be addressed such as the comparative performance of selective and non-selective schools, or Welsh medium and English medium schools.

31. But development of these methods will require a number of key technical questions to be resolved, in particular:

--- the most appropriate method of scoring students' examination achievements;

--- the most appropriate method of calculating value added for a group of students on a course or at a particular institution;

--- the extension of the value-added approach to vocational qualifications;

--- the extension of the value-added approach to outcomes of education not currently covered by externally validated qualifications.

32. Analysis of the Youth Cohort Study has already yielded valuable pointers about A-level performance:

--- the different types of post-16 institution are catering for groups of young people with somewhat different abilities, when judged in terms of 16+ (year 11) examination achievements. The intakes to sixth forms in maintained schools, to sixth form colleges and to tertiary colleges are similarly qualified. In comparison with these groups, entrants to sixth forms in independent schools are markedly better qualified whilst entrants to non-tertiary colleges of further education are somewhat less well-qualified;

--- young people's performance in examinations at age 16 (year 11) is on average a good indication of subsequent performance at A-level. The data do not show any single type of
institution as consistently more effective at A-level than the others, when full account is taken of differences in the examination qualifications of their intakes at 16-plus. They all 'add value' to GCSE in roughly equal measure. One particular institution may be more effective than another, but differences between types, including independent schools, are not discernible (although there may be differences in effectiveness in educating students up to age 16 which this analysis is not designed to detect).

33. These are important findings which should influence the debate about schools' and colleges' performance. In particular, they point to the desirability of assessing schools and colleges on the basis of value added to the extent practicable and as soon as possible.
REFERENCES
APPENDIX 1:

EXAMINATION POINTS SCALES AND SAMPLE SIZES

<table>
<thead>
<tr>
<th>A-level UCCA Points Score</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>O</th>
<th>U</th>
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</thead>
<tbody>
<tr>
<td>Grade Obtained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Points Awarded</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>Y11 Examination Score</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>~</th>
<th>~</th>
<th>U</th>
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<tbody>
<tr>
<td>Grade Obtained at:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>O level</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CSE</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>U</td>
</tr>
<tr>
<td>GCSE</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>4</td>
<td>5</td>
<td></td>
<td>U</td>
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<tr>
<td>Points awarded</td>
<td>7</td>
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<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
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</tr>
</tbody>
</table>

Table 1
NUMBERS OF STUDENTS IN EACH TYPE OF INSTITUTION BROKEN DOWN BY Y11 EXAMINATION SCORES

<table>
<thead>
<tr>
<th>Institution Type</th>
<th>Y11 Examination Score</th>
<th>0-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
<th>Above 60</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintained Secondary</td>
<td></td>
<td>68</td>
<td>202</td>
<td>270</td>
<td>219</td>
<td>83</td>
<td>842</td>
</tr>
<tr>
<td>Independent School</td>
<td></td>
<td>15</td>
<td>38</td>
<td>108</td>
<td>125</td>
<td>98</td>
<td>384</td>
</tr>
<tr>
<td>Sixth Form College</td>
<td></td>
<td>24</td>
<td>72</td>
<td>80</td>
<td>51</td>
<td>20</td>
<td>247</td>
</tr>
<tr>
<td>FE College (not tertiary)</td>
<td></td>
<td>53</td>
<td>54</td>
<td>45</td>
<td>20</td>
<td>6</td>
<td>178</td>
</tr>
<tr>
<td>Tertiary College</td>
<td></td>
<td>8</td>
<td>14</td>
<td>28</td>
<td>15</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>
APPENDIX 2:

REGRESSION EQUATIONS EMPLOYED TO PREDICT A-LEVEL SCORES

Each regression equation is expressed in relation to the average A-level student with a Y11 examination score of 46 points

(a) UCCA Points Score

<table>
<thead>
<tr>
<th>Predicted score</th>
<th>8.0</th>
<th>times (Y11 Examination Score minus 46)</th>
<th>+0.24 times (1, if female)</th>
<th>-0.8 times (1, if non-graduate parents)</th>
</tr>
</thead>
</table>

Overall $R^2 = 39\%$

(b) Number of A-Level Passes

<table>
<thead>
<tr>
<th>Predicted score</th>
<th>2.4</th>
<th>times (Y11 Examination Score minus 46)</th>
<th>+0.05 times (1, if female)</th>
<th>-0.08 times (1, if non-graduate parents)</th>
</tr>
</thead>
</table>

Overall $R^2 = 28\%$

(c) UCCA Points Score/A-Level Entered

<table>
<thead>
<tr>
<th>Predicted score</th>
<th>2.5</th>
<th>times (Y11 Examination Score minus 46)</th>
<th>+0.05 times (1, if female)</th>
<th>-0.11 times (1, if non-graduate parents)</th>
</tr>
</thead>
</table>

Overall $R^2 = 25\%$

(d) UCCA Points Score (from the multi-level model)

<table>
<thead>
<tr>
<th>Predicted score</th>
<th>8.7</th>
<th>times (Y11 Examination Score minus 46)</th>
<th>+0.29 times (1, if female)</th>
<th>-0.9 times (1, if non-graduate parents)</th>
</tr>
</thead>
</table>

Overall $R^2 = 37\%$

Notes: In addition to Y11 examination score, five other variables were included in the initial analyses for selection. In each case gender (0 = male, 1 = female) was significant at the 1% level and parental education (0 = graduate, 1 = non-graduate) was significant at the 5% level. Three other variables were also considered but did not enter into the equations: parental social class, ethnic background and housing tenure. This does not mean that these variables are unimportant in relation to examination achievement at age 16. Rather it means that they do not add to the explanation of the variation at age 18, once achievement at 16 has been taken into account.
Exhibit 2A
NUMBER OF A-LEVEL PASSES
The number of A-level passes is correlated with year 11 examination points score

Source: YCS 1987 Cohort

Exhibit 2B
AVERAGE UCCA POINTS PER A-LEVEL ENTERED
There is a correlation between UCCA points per A-level entry and year 11 examination score

Source: YCS 1987 Cohort