RESEARCH

Use of an Aptitude Test in University Entrance – A Validity Study

Relationships between SAT® scores, attainment measures and background variables

Catherine Kirkup, Ian Schagen, Rebecca Wheater
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National Foundation for Educational Research

department for
education and skills
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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education and Skills.

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The NFER project team for this work consisted of:

Chris Whetton	**Project Director**
Catherine Kirkup	**Researchers**
Rebecca Wheater	
Stuart Gordon	**Design**
Margaret Parfitt	**Project Administration Assistant**
Anne Milne	**Research Data Services**
Dave Hereward	
Ed Wallis	
Ian Schagen	**Statistics, Research and Analysis Group**
Jo Morrison	
Ben Styles	
Tilaye Yeshanew	

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Table of contents

1 Executive summary

1.1 Introduction

In September 2005 the National Foundation for Educational Research (NFER) in association with the Department for Education and Skills (DfES), the Sutton Trust and the College Board, began a five-year research study to examine the validity of an aptitude test in higher education admissions. This report describes and explores the relationships between scores on the SAT Reasoning Test™ (also known in brief as the SAT®), attainment measures (A levels and GCSEs) and background characteristics of the student sample. The SAT® has three measures: Critical Reading, Mathematics and Writing.

1.2 Key findings

The number of students who took the SAT® in autumn 2005 and agreed that their data could be used within the research was 9022. Of these SAT® participants, 8041 students were matched to both GCSE and A level attainment data and form the basis of the analysis for this report (hereafter referred to as the main sample). The key findings to date were as follows:

- The mean SAT® scores of the English sample were very similar to US mean scores and individual items functioned in a similar way in comparable samples of students.

- The correlation between A level scores and the SAT® was 0.64 (i.e. high A level scores were generally associated with high scores on the SAT®). This correlation was higher than correlations of between 0.33 and 0.50 in a previous pilot study (McDonald *et al*., 2001a), most likely due to restructuring of both measures in the intervening years.

- SAT® scores and total A level (or equivalent) score points were generally related in a similar way to a number of educational and socio-economic factors, including the type of institution attended, ethnicity, eligibility for free school meals (FSM), etc.

- Female students had higher total GCSE and A level points scores and achieved significantly higher scores on the SAT® Writing component than male students. Male students performed significantly better on the SAT® Mathematics component and on the SAT® as a whole.

- Two regression analyses, one controlling for A level total scores and one controlling for both A level scores and average prior attainment at GCSE, showed that female students, some ethnic minorities, students with special educational needs (SEN) and students learning English as an additional

language (EAL) appeared to perform less well on the SAT® than expected compared to default categories (i.e. boys, white students, etc).

- Students in independent schools did better than expected on the SAT®, and students in FE colleges did worse, when A level results alone were taken into account. In both cases, they neither did better nor worse than expected when average prior attainment at GCSE was also taken into account.

- Students who had gained three or more grade As at A level achieved significantly higher scores than the rest of the sample on all components of the SAT®. However there was considerable variation in the SAT® scores of this group offering the possibility of differentiation between high ability HE candidates should the SAT® prove to be a valid predictor of degree outcomes.

- Students who achieved very high SAT® scores were not always the same students who achieved three or more A grades at A level and vice versa. Students who achieved very high SAT® scores but did not form part of the 'three A grades' group tended to be male students.

At this stage, the analysis was focussed on overall attainment and broad background variables. Further analyses will be carried out during the next twelve months, looking at differences between students according to their A level subjects and examining the social, educational and economic background variables using more complex statistical modelling of the data. This analysis will incorporate data on the attainment of the institutions attended, census data relating to the home postcodes of students in the sample and, where available, information supplied by the students themselves (e.g. parental education). Without higher educational outcomes it will not be possible, as yet, to answer the main research questions. However, this further analysis may reveal more about the performance of students across the SAT®, A levels and GCSEs according to more sensitive measures of disadvantage.

1.3 Structure of the report

Section 2 describes the background to the research and the aims and objectives of the study. Section 3 outlines the methodologies employed and section 4 details the representation and background characteristics of the main SAT® sample and the subsequent sub-samples who took part in the student surveys in spring and autumn 2006.

In section 5 of this report we report the findings of the analysis of the quantitative data examining the relationships between the SAT® and both A level and GCSE attainment. These results are then explored in relation to two key research questions in sections 6 and 7.

Section 8 presents the findings from the questionnaire surveys and section 9 outlines future potential phases of this research study and suggested milestones when further results will be disseminated.

2 Introduction

In September 2005 the National Foundation for Educational Research (NFER) in association with the Department for Education and Skills (DfES), the Sutton Trust and the College Board, began a five-year research study to examine the validity of an aptitude test in higher education admissions. This report describes and explores the relationships between scores on the SAT Reasoning Test™ (also known in brief as the SAT®), attainment measures (A levels and GCSEs) and background characteristics of the student sample. It incorporates information given in the unpublished interim report (Kirkup *et al.*, 2006) on the administration and technical functioning of the SAT®, the characteristics of the student sample and a preliminary analysis of the first student survey.

2.1 Background

Higher education brings considerable benefits to graduates in terms of salary, job security, employment opportunity, and so on. Although the number of students entering higher education (HE) has grown enormously in recent years, some groups are still under-represented. In a report into the participation in higher education over the period 1994-2000 (HEFCE, 2005) it was noted that young people living in the most advantaged 20 per cent of areas were five or six times more likely to go into higher education than those from the least advantaged 20 per cent of areas. The benefits of higher education vary according to the course studied and the institution attended. The demand for university places generally exceeds the supply available, particularly for popular courses or popular institutions. Where there are competing applicants, universities and other higher education institutions have to assess the merit and potential of each student in order to decide who to admit.

In its report, the Admissions to Higher Education Steering Group, chaired by Professor Steven Schwartz (DfES, 2004), identified several issues to be addressed to bring about improvements to the admissions system in England and to ensure a fair and transparent system for all students.[1] As the system stands at present, most of the offers of university places to prospective students are made on the basis of predicted grades rather than examination results. Although the process is moving towards a post-qualification application system, a difficulty that will remain for admissions staff is that they may have to choose from an increasingly large number of highly-qualified candidates who achieve a string of A grades in their A level examinations. A further issue identified by the Schwartz report was that the information used to assess university applicants may not be equally reliable. Although 'prior educational attainment remains the best single indicator of success at undergraduate level' (page

[1] One recommendation of the report was the creation of a central source of expertise and advice on admissions issues, resulting in the Supporting Professionalism in Admissions (SPA) Programme.

5), it is recognised that for some students, their true potential may not be reflected in their examination results due to social or educational disadvantages.

In order to differentiate further between applicants, some higher education institutions have already introduced or are planning to introduce additional tests or assessments for courses where competition for places is particularly acute. For example, applicants to Cambridge University may be required to attend an interview, to submit sample essays and, depending on the course applied for, to take the Thinking Skills Assessment test (TSA), the Bio-Medical Admissions Test (BMAT) or the National Admissions Test for Law (LNAT). Oxford University has already introduced a History Aptitude Test and is planning to introduce something similar for English. From 2007 onwards, applicants to the medical and dental schools of 24 UK universities will be required to sit the UK Clinical Aptitude Test (UKCAT). In addition Cambridge Assessment, in conjunction with the Australian Council for Educational Research (ACER), are piloting a test of generic reasoning and thinking skills (called uniTEST) with seven UK universities, with the stated aim of assisting higher education institutions with the student selection process.

A recommendation of the Schwartz group was that assessment methods used within the admissions system should be reliable and valid.

> *Admissions policies and procedures should be informed and guided by current research and good practice. Where possible, universities and colleges using quantifiable measures should use tests and approaches that have already been shown to predict undergraduate success. Where existing tests are unsuited to a course's entry requirements, institutions may develop alternatives, but should be able to demonstrate that their methods are relevant, reliable and valid.*
> (p. 8)

A levels are central to the higher education admissions process and the ability of A level grades to predict degree outcomes has been demonstrated using a large data set (Bekhradnia and Thompson, 2002), but similar evidence regarding the predictive validity of admissions tests or aptitude tests within the UK context appears to be lacking. Amongst its wider recommendations the Schwartz report encouraged the commissioning of research to evaluate the ability of aptitude tests to assess the potential for higher education.

The principal study underpinning this current research was the pilot comparison of A levels with SAT® scores conducted by NFER for The Sutton Trust in 2000 (McDonald *et al.*, 2001a). SAT® scores were collected together with A level grades, prior attainment and a range of background information for 1295 students from a sample of high-attaining, low-attaining and selective independent schools. The study revealed that the SAT® was only modestly associated with A level grades, which indicated that the SAT® was assessing a distinct construct from A levels. (There was a slightly stronger association between the SAT® and GCSE attainment.) However, there was no evidence that the association differed according to background factors such as ethnicity, parental socio-economic status or overall achievement of the school.

The 2000 study used a shortened version of the SAT®, and further analyses explored the functioning of this test with English students. These showed that the SAT® provided a coherent assessment of verbal and math reasoning ability, and that individual items appeared to function similarly for English and American students. Item-level analyses found little evidence of bias in SAT® items between males and females, Whites and Asians, and overall attainment of the school.

Although the SAT® has been relabelled as a 'reasoning' test rather than a test of 'aptitude', it is still generally perceived as a test of academic aptitude. Implicit within the term 'aptitude' is the concept of predictive validity. The purpose of an aptitude test is to measure an individual's potential for obtaining a certain goal. In this case, the goal is successful completion of a university course and achievement (i.e. degree class). If a high proportion of applicants who score well on a certain test go on to successfully complete their degrees, and those who score lower are somewhat less likely to be successful, we would say that the test has good predictive validity.

Although the 2000 study examined the association between the SAT® and A levels, no recent study of the predictive power of SAT® results for university outcomes has been undertaken in the UK. Nor has any similar study been undertaken on the predictive power of the other admissions tests (subject-specific or general) that are being introduced by many UK organisations. The aim of the current study is to provide such information in due course, using the latest version of the SAT® (see section 3.1). For a detailed discussion of aptitude testing for university entrance see also the literature review conducted by McDonald *et al.* for the Sutton Trust (2001b).

2.2 Objectives of the study

The primary aim of the study is to examine whether the addition of the SAT Reasoning Test™ alongside A levels is better able to predict university participation and outcomes. Two specific issues are also to be addressed, namely:

- Can the SAT® identify students with the potential to benefit from higher education whose ability is not adequately reflected in their A level results because of their (economically or educationally) disadvantaged circumstances?

- Can the SAT® distinguish helpfully between the most able applicants who get straight As at A level?

A secondary aim of the study is to evaluate the extent to which pastoral support and teaching methods affect the retention and progress of students within higher education.

3 Methodology

In this section the main features of the SAT®, the process of contacting schools to participate in the research and the administration of the test itself are described. The methods by which students were contacted for the subsequent questionnaire surveys are also outlined.

3.1 The SAT Reasoning Test™

The SAT Reasoning Test™ (previously known as the Scholastic Assessment Test) has been recently revised and now comprises three main components: Critical Reading, Mathematics and Writing. In the US the administration of the SAT® is split into ten separately timed sections, with a total test time, excluding breaks, of three hours and forty-five minutes.

The Critical Reading section of the SAT® contains two types of multiple-choice items: sentence completion questions and passage-based reading questions. Sentence completion items are designed to measure students' knowledge of the meanings of words and their understanding of how sentences fit together. The reading questions are based on passages that vary in length, style and subject and address vocabulary in context, literal comprehension and extended reasoning. The Mathematics section contains predominantly multiple-choice items but also a small number of student-produced response questions that offer no answer choices. Four areas of mathematics content are covered: number and operations; algebra and functions; geometry and measurement; and data analysis, statistics and probability. The new Writing section (first administered in the US in 2005) includes multiple-choice items addressing the mechanical aspects of writing (e.g. recognising errors in sentence structure and grammar) and a 25 minute essay on an assigned topic.

In the English trial, no changes were made to any of the questions but one section was removed (a section of new items which do not contribute to the US students' scores) giving a total of nine sections and an overall test time of three hours and twenty minutes.

3.1.1 Contacting schools

All maintained and independent schools and colleges in England with students in Year 13 were invited to participate in the research by administering the SAT® test to any students studying (A2) A levels. In September 2005, each institution was sent a letter and an information leaflet outlining the aims of the study and giving them brief details of what was involved for them and for their students and the feedback they would receive. Although their help was encouraged it was made clear that participation was entirely voluntary. Schools and colleges that were willing to participate were asked to indicate the number of students to whom they would anticipate administering the SAT® test in November 2005. The invitation process subsequently included reminding non-responding schools, twice by letter, then by fax and finally by telephone. At this stage the primary reason given by schools and

colleges that did not wish to participate was the length of the test (3 hours 20 minutes) - either because of difficulties fitting it into the timetable or due to concerns about taking students away from valuable A level study time. The other major reason cited was lack of time either through pressure of work or staff commitments.

The letters inviting participation coincided with the press release to the media resulting in an initially positive response from schools and colleges. By the end of October approximately 380 schools and 50 further education colleges had agreed to participate with an estimated student sample of around 38,000. Reminders sent to non-responding schools resulted in a further number of schools/colleges agreeing to participate.

In total, SAT® test materials were sent to 43,429 students at 660 institutions that had agreed to assist at the beginning of November. The majority of schools/colleges received their tests by 8 November 2005. At the end of January 2006, 294 institutions had returned completed SAT® tests for a total of 9207 students (see section 3.1.3).

3.1.2 Materials

Participating schools and colleges were sent two packs of materials:

- a familiarisation pack containing an SAT® test preparation booklet and an information leaflet about the study for each student
- a test pack containing administration guides and sufficient SAT® test booklets, answer forms, agreement to participate forms and HB pencils for participating students.

Schools and colleges were advised that, although no formal preparation was required, it was recommended that students were given the familiarisation materials in advance of the live test administration so that they could acquaint themselves with the types of questions in the SAT® and how to fill in the answer sheets. Originally it had been planned to send the familiarisation packs to schools in October in advance of the test materials. However, there proved to be insufficient time to despatch them separately to schools and colleges. It is possible that some schools/colleges may have decided there was insufficient time for students to prepare for the SAT® and that it was unfair to administer such a novel test without thorough preparation. However, there is very little evidence that this was the case, and it is therefore difficult to assess whether an earlier, separate despatch of familiarisation materials to schools/colleges would have produced a higher response rate.

The agreement to participate forms which students were asked to sign at the beginning of the test session collected contact details and information about the amount and type of preparation they had carried out. This was to enable the analysis of the results to take account of the level of familiarity of students with the SAT® test (see Appendix 4).

3.1.3 Response rates

Following the despatch of the materials, a sizeable number of schools and colleges that had originally agreed to participate contacted NFER to withdraw from the study. A further large number of schools returned materials unused at the end of the test period. The main reasons given for withdrawal or for returning materials unused were that time commitments prevented them from being able to administer the tests (115 schools/colleges) or the length of the test itself (79 schools/colleges). A very small number of schools and colleges had concerns focussed on the content of the test, for example, that the mathematics component was too demanding for students not studying mathematics, that some sections were repetitive, or that the test had not been anglicised for English students. Despite attempts to contact non-responding schools and colleges, 170 schools/colleges failed to return test materials or to provide a reason for their non-return.

In a large number of cases, schools and colleges participated as agreed but achieved much lower levels of participation than had been anticipated as illustrated by one school visited by a member of the research team.

> *The test was done on a voluntary basis with the students given the option of doing the test or attending their normal classes. There had been a sixth-form assembly to encourage the students to take part. Of the 127 students in Year 13, a total of 44 took the test. A number of students came to the hall on the day of the test, but when they realised the test was voluntary, left.*

Based on the number of students that schools and colleges had originally indicated might participate in the study, an average of 66 tests were sent to each participating institution. The average number of completed test booklets per school/college was 31.

During the last two weeks of the autumn term, non-responding schools and colleges were contacted by post and subsequently by telephone to remind them to return their completed test materials if at all possible by the end of the term. However, in order to maximise the number of students in the achieved sample, some schools/colleges were granted additional time to carry out testing and the final date for the return of materials was extended to the end of the second week of January.

At the end of January 2006, 294 institutions had returned completed SAT® tests for a total of 9207 students. The remaining 366 schools/colleges had returned unused materials or had failed to return their test materials.

The completed answer sheets were shipped to the US and, with the exception of the essay section, were machine-scored by ETS. Each essay was scanned and then independently scored by two "readers" on-screen. If the two readers' scores differed by more than one point, the essay was sent to a third chief reader for resolution. Scaled scores for each student and other item-level data were returned to NFER in March 2006.

3.2 Data matching

Following the receipt of A level results from the DfES in December 2006, students in the SAT® sample were matched to their attainment data. As described more fully in section 4.1, students were excluded from the analysis if they had withdrawn from the study or they did not have, or could not be matched to, the two main attainment variables of interest, GCSE and A level data. The number of students with the required data was 8041 and this sample formed the basis for the analyses reported in section 5.

3.3 Student survey – spring 2006

In March 2006 the 9022 students who had taken the SAT® and had agreed to participate in the study were sent a 16-page questionnaire, with pre-printed names, via their school or college. The questionnaire asked them to provide some background details about their home and family circumstances and asked about their experiences of school or college in Years 12 and 13, their immediate plans after A levels and their views of higher education.

Independent schools and further education colleges were also sent a student data form and asked to record the ethnic group and any special educational needs of each participating student. The equivalent information for students at schools in the maintained sector was supplied by the Department for Education and Skills (DfES).

By the end of the spring term, schools and colleges had returned completed questionnaires for approximately 6250 students. A number of schools and colleges had failed to respond to reminders to return questionnaires or had returned complete sets of blank questionnaires. In order to maximise the response rate, further questionnaires were printed and 2121 questionnaires were despatched to the home addresses of the non-responding students. By the final deadline of 19 May 2006 a total of 6883 completed questionnaires had been received. The vast majority of the questionnaires were returned by schools and colleges. Of the 2121 questionnaires sent to home addresses, 333 were returned completed.

From the 6883 questionnaires returned some had to be excluded from the analysis: duplicated questionnaires (where students had filled in copies at home and at school/college), a small number of spoilt questionnaires and four that were removed from the dataset in response to students' requests to withdraw from the study. The analysis of the resultant sample of 6825 respondents was carried out in June 2006 and a copy of the questionnaire annotated with students' responses is given in Appendix 1.

3.4 Student survey – autumn 2006

At the beginning of September 2006 a second questionnaire was sent to 8814 students (excluding withdrawals) who had supplied a home address for future contact. To thank students for their continued participation in the research, students were offered the opportunity to enter a prize draw to win one of five £1000 cash prizes. As a legal

requirement, students were not obliged to complete the survey in order to enter the prize draw but it was hoped that it would motivate students to do so. As well as completing the questionnaire students were asked to provide, or update, their email address so that we could contact them electronically in future. Of the 8814 questionnaires despatched by post, approximately 150 were found to be undeliverable (address or addressee unknown).

Reminders to non-respondents were sent out at the beginning of October (either by email or post) with the option of completing the questionnaire on-line if they preferred to do so. The deadline for completion of the survey was also extended until 8 January 2007 in order to maximise the response rate. An additional text message reminder was sent in November to those non-responding students, who had supplied a mobile phone number. All students were sent a seasonal card in December, thanking them for their participation, giving them details of how to access more information about the research and reminding them of the final deadline for the survey.

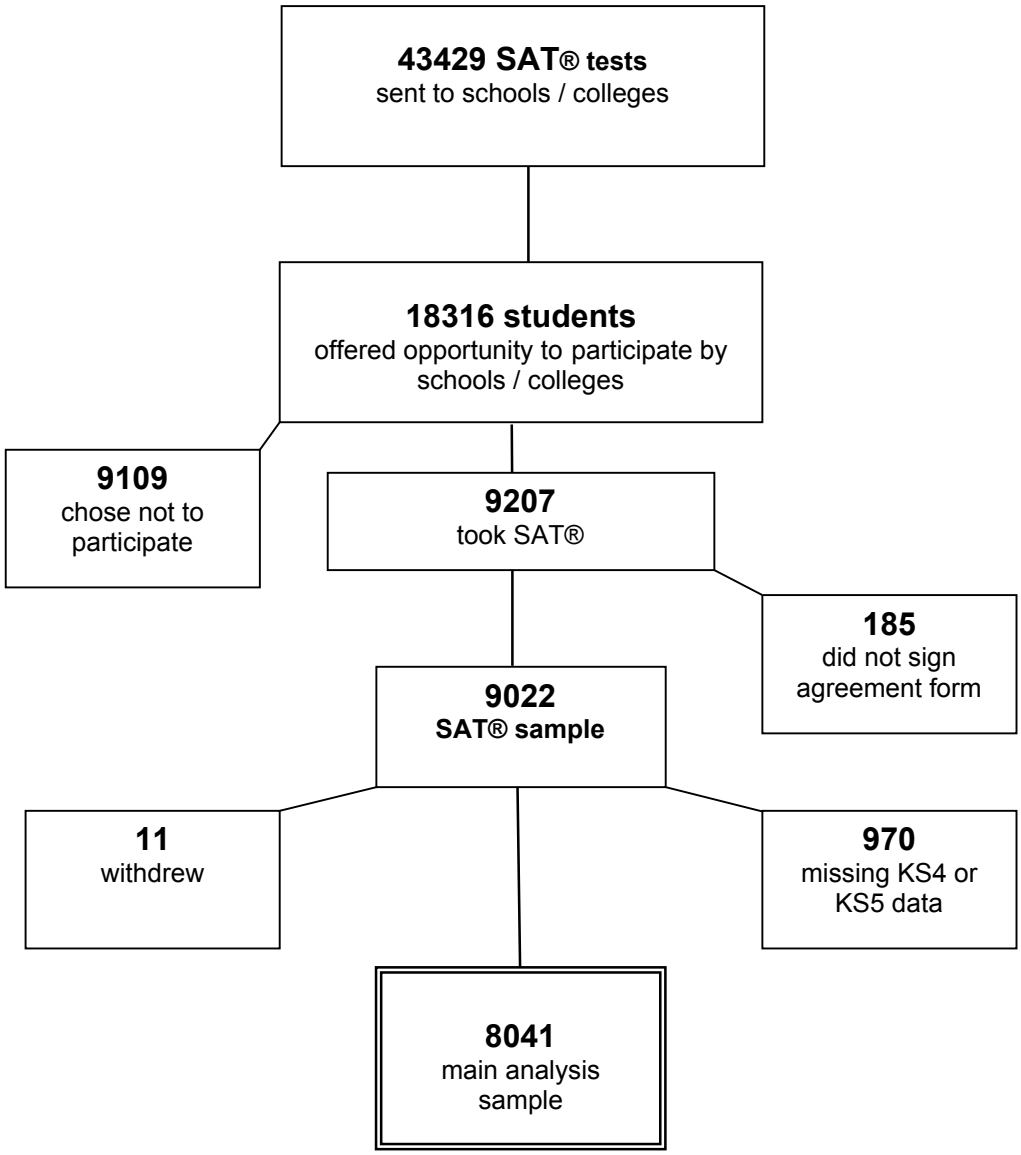
At the end of the autumn survey a total of 3352 responses had been received (excluding some duplicates where students had completed both paper and online versions) - a response rate of 38 per cent. Useable email addresses were held for approximately 2800 students. For the analysis, students with missing attainment data, who were not included in the main sample, were excluded, resulting in an autumn survey sample of 3177 respondents. A copy of the questionnaire annotated with students' responses is given in Appendix 2.

4 Student samples

4.1 Representation of the main sample

The number of students at each phase of the project to date is shown in Figure 4.1.

Figure 4.1 Components of the main sample



Of the 9207 students who had completed an SAT® test, 9022 had signed a form agreeing for their data to be used in the study; representing 8600 students in schools and 422 students in FE colleges. In January 2007 the data for these students, excluding a small number that withdrew from the study, was matched with the 2005/06 National Pupil Database supplied by the DfES. The dataset included A level data, GCSE prior attainment data and, for any student educated within the maintained sector, Pupil Level Annual School Census (PLASC) data. The main reasons that data

was missing for some students were either that they had taken the SAT® in Y12 and had therefore not completed their A level courses or that despite several attempts to match to the DfES dataset their KS4 data or their KS5 data could not be found. The number of students with valid data on all three main variables (SAT® scores, A levels and GCSEs) was 8041, hereafter referred to as the main sample. The 'national population' was derived from the same National Pupil Dataset by extracting those students taking two or more GCE A levels, i.e. the population that would be likely to be affected should a test such as the SAT® ever be introduced.

Table 4.1 shows the main student sample by type of educational institution, as compared with the national population of students entered for two or more GCE A levels.

Table 4.1: Main student sample by type of post-16 institution

	Main sample		National population*
	Number	Per cent	Per cent
Comprehensive schools to 18**	4200	52.2	45.9
Grammar schools	1701	21.2	9.1
Independent schools	1800	22.4	15.0
FE (and sixth form) colleges	340	4.2	29.9
Total	8041	100.0	100.0

** candidates entered for 2+ GCE A levels in 2005/06 (source: DfES)*
*** includes other non-selective schools*

Independent schools and grammar schools were over-represented in the sample whilst FE colleges were substantially under-represented. In an earlier analysis of participation in the SAT® trial at the institution level (i.e. comparing numbers of participating colleges rather than individuals) the under-representation of FE colleges was less pronounced. This suggests that there was a greater loss of individuals at FE colleges (i.e. relatively more students at FE colleges chose not to participate when offered the opportunity to do so).

Comparisons of the A level and GCSE scores of the main sample against the national population are given in section 5.1.1.

Background characteristics of the main sample are shown in Table 4.2. These details were obtained by combining information from the PLASC data for students from maintained schools with information supplied by individual FE colleges and independent schools.

Table 4.2: Background characteristics of the main sample

		Main sample		National population*	
		N	Valid per cent	N	Valid per cent
Sex	Male	3692	45.9	98625	45.6
	Female	4349	54.1	117718	54.4
Ethnicity	Asian or Asian British	670	9.1	7799	6.9
	Black or Black British	117	1.6	2243	2.0
	Chinese	116	1.6	996	0.9
	Mixed	145	2.0	1392	1.2
	White	6212	84.4	93732	83.2
	Other	104	1.4	6499	5.8
SEN	No provision	7437	97.3	114818	97.9
	School Action (A)	137	1.8	1632	1.4
	School Action Plus (P)	35	0.5	474	0.4
	Statement of SEN (S)	32	0.4	384	0.3
FSM eligibility	No	5953	96.1	114058	97.2
	Yes	243	3.9	3250	2.8
Total		8041	100	216343	100

** candidates entered for 2+ GCE A levels in 2005/06 (source: DfES)*
Valid percentages exclude missing data.
Due to rounding, percentages may not sum to 100.

As can be seen from Table 4.2, there were more female students in the main sample than male students (54 per cent and 46 per cent respectively), in line with the national population of A level entrants.

For a small number of students in the main sample, and for a considerable numbers of students in the national sample, information on ethnicity, special education needs and eligibility for free school meals was missing. In the national figures approximately one third of the missing data was for students from the independent sector. Comparing those for whom information was available, there were slightly more Asian and Chinese students in the main sample compared to the national population of A level students and slightly fewer Black students. The figures for students with special educational needs and those eligible for free school meals may be somewhat distorted due to the large numbers of students in the national sample for whom data was missing. Approximately three per cent of the main sample were known to be eligible for free school meals and 2.5 per cent were known to be on the register of special

educational needs. The figures for these categories are slightly higher in the table where missing data has been excluded in order to enable comparisons with the national data.

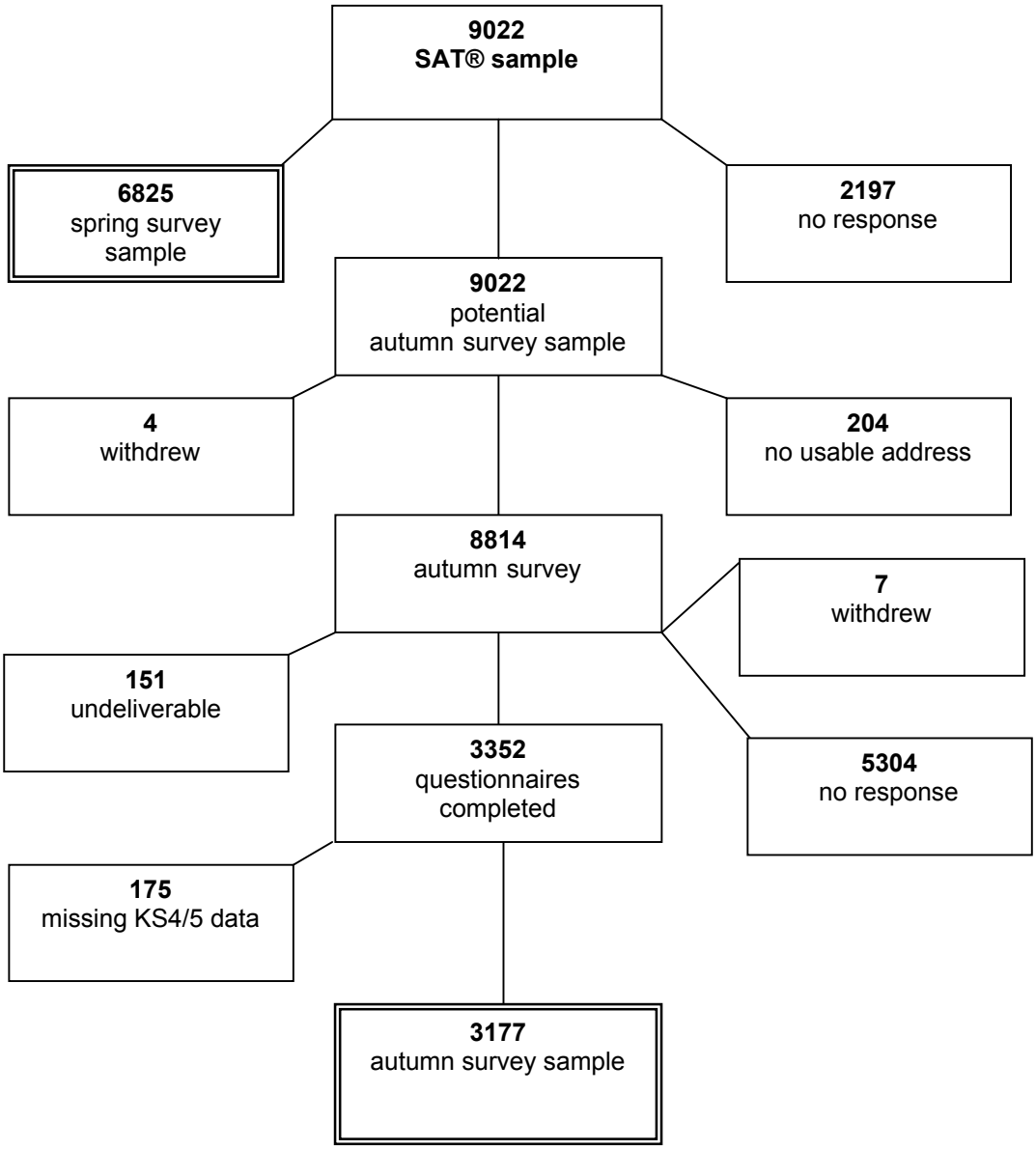
Attainment data and SAT® data for the main sample is reported in Section 5. For those students in the main sample now in higher education, degree outcomes will be supplied by HEFCE (Higher Education Funding Council for England) at the end of their three year courses irrespective of contact with them in the interim period. Therefore degree outcome data for the majority of the main sample will be available to examine the issue of predictive validity. Collecting qualitative data is more complex as outlined in section 4.2 below.

4.2 Student survey sub-samples

At various stages during the research additional information from participating students may be collected via questionnaire surveys. To date, two such surveys have been carried out, the responses to which are shown in Figure 4.2.

Approximately three-quarters of the original SAT® sample (6825 students) responded to the first survey in spring 2006, which was administered through schools and colleges. However, the second survey in autumn 2006 required students to be contacted individually. Recognising the difficulties of maintaining contact with a highly mobile population, students were contacted in a number of different ways during this second survey and a prize draw incentive was offered (see section 3.4) A response rate of 38 per cent (of potential respondents) was achieved for the autumn survey, although some of these were subsequently excluded because of missing attainment data.

Figure 4.2: Components of the sub-samples



A comparison of the background characteristics of the main sample and the two questionnaire survey samples is presented in Table 4.3. In this table, students who took part in the spring survey but were not subsequently included in the main sample were excluded.

Of the main sample of 8041 students, 77 per cent responded to the spring survey, 40 per cent to the autumn survey and 34 per cent (2750 students) to both surveys. For future potential surveys the current database contains email addresses for approximately 2800 students and postal contact details for a further 5800.

Table 4.3: Background characteristics of the survey sub-samples

		Main	Survey samples	
		per cent (n = 8041)	Spring per cent (n = 6189)	Autumn per cent (n = 3177)
Sex	Male	46	44	37
	Female	54	56	63
Ethnicity	Asian or Asian British	8	8	6
	Black or Black British	1	1	1
	Chinese	1	2	1
	Mixed	2	2	2
	White	77	78	81
	Other	1	1	1
	Missing	8	7	8
EAL	No	70	68	70
	Yes	7	7	6
	Missing	23	25	24
SEN	No provision	92	93	93
	School Action (A)	2	2	1
	School Action Plus (P)	0	1	0
	Statement of SEN (S)	0	0	1
	Missing	5	4	5
FSM eligibility	No	97	97	97
	Yes	3	3	3
Post-16 institution type	Comprehensive schools	52	49	49
	Grammar schools	21	22	23
	Independent schools	22	25	23
	FE / sixth form colleges	4	5	6
Total		100	100	100

Due to rounding, percentages may not sum to 100.
School Action: Interventions provided by the teacher and / or special needs co-ordinator that are additional to or different from those provided as part of the school's usual differentiated curriculum.
School Action Plus: the next stage in the SEN support process when external services are involved.

Although smaller in size, the survey samples appear to be reasonably similar to the main sample in terms of their background characteristics. The percentage of male respondents was lower in the autumn survey than in the spring survey. The autumn questionnaires were sent to individual home addresses whereas the spring survey was administered via schools and colleges. Also an incentive was offered to students in the autumn survey which may have impacted differently on male and female students.

There were also fewer Asian or Asian British respondents in the autumn survey compared to the percentage of Asian students in the main sample and the spring survey. The percentage of respondents from comprehensive schools in both survey samples was slightly less than the percentage in the sample as a whole whereas the percentage of respondents from FE colleges was slightly higher in the surveys. Although similar to the full sample in terms of their background characteristics, a comparison of respondents and non-respondents to the spring and autumn survey showed that the mean total A level points of respondents (872 in the spring survey and 930 in the autumn) were significantly higher than the mean points score of non-respondents (770 and 795 respectively). This is perhaps to be expected given that the subject of the research is more likely to be salient for high achieving students who are either in, or intending to enter, higher education.

For a brief discussion of the possible impact of the prize draw incentive relating to the autumn survey see section 4.2.2.

4.2.1 Additional background characteristics from the spring survey

The spring 2006 questionnaire provided an opportunity to ask students for additional background information on their home circumstances. In subsequent phases of the research, it is hoped to relate the information collected from these surveys to the university destinations and degree outcomes of students in the main sample. As this data was analysed before the A level data was received, findings in this section, and in section 8, are based on the 6825 students who responded, of whom 6189 students are included in the main sample.

Of the 6825 students, 86 per cent had always lived in the UK. Of those who had not, the average length of stay in the UK was nine years. Approximately 15 per cent of the students indicated that they spoke a language other than English at home[2]. There were a total of 53 different languages spoken. The most commonly spoken home languages were Mandarin and Cantonese, Gujerati, Punjabi and Urdu.

[2] This figure is somewhat higher than the percentage of students known to be learning English as an additional language (see Table 4.3). This may be due to missing data or to some students listing another language spoken at home rather than the language that is usually spoken at home.

The majority of students (86 per cent) lived in a property owned by a family member and six per cent lived in rented accommodation.

Table 4.4 provides information on the household structures in which students lived.

Table 4.4: 'Who do you live with most of the time?'

	Number	Per cent
Father only	154	2.3
Mother only	1006	14.7
Mother and father (no other adults)	4853	71.1
1 natural and 1 step parent/partner	389	5.7
Other	320	4.7
Missing	103	1.5
Total	6825	100.0

Due to rounding, percentages may not sum to 100.

The majority of students came from two parent families and a significant number were looked after by their mother only. Included in the *Other* category were students who lived with one or more parent and also another adult and those students who lived with an adult other than a parent, such as a grandparent. Also included in the *Other* category were approximately 50 students attending boarding schools, 12 students who lived with foster parents and two students in care.

Approximately 35 per cent of the students' mothers and 41 per cent of the students' fathers had studied at a higher education institution. Many of the students had a sibling who had attended or was studying at a university (36.7 per cent). However, one third of the sample had no close relative who had gone to university.

The students were asked to write the occupation of the parent who earned the most, describe briefly what this entailed and say whether this parent had responsibility for supervising other members of staff. The parental occupations were then coded using Standard Occupational Classification 2000 (SOC 2000). The codes were then grouped as shown in Table 4.5.

Table 4.5: Parental occupation by socio-economic classification

	Number	Valid per cent	National per cent*
1.1 Large employers and higher managerial occupations	767	12.8	26.2
1.2 Higher professional occupations	1332	22.3	
2 Lower managerial and professional occupations	1718	28.7	32.6
3 Intermediate occupations	576	9.6	14.3
4 Small employers and own account workers	616	10.3	7.0
5 Lower supervisory and technical occupations	342	5.7	5.0
6 Semi-routine occupations	376	6.3	10.3
7 Routine occupations	223	3.7	4.6
8 Unemployed (housewives, students, retired, etc)	31	0.5	0.0
	5981	100.0	100.0
Missing / uncodeable occupations	844		
Total	6825		

Due to rounding, percentages may not sum to 100.

** entrants to UK HEIs 2004/05 (DfES analysis of HESA student record 2004/05)*

Over half of the spring survey sample had at least one parent working in professional or managerial occupations. Coverage by parental occupation is reasonably well matched to the national profile of HE entrants, although the HE population does not reflect that of society as a whole.

The spring 2006 questionnaire also asked the students to estimate how many books were in their home. In previous studies (e.g. Kirkup *et al.*, 2004), this has been found to be a useful indicator of socio-economic status.

Table 4.6: The number of books in students' homes

No. of books	Number	Per cent
None (0 books)	47	1
Very few (1-10 books)	224	3
Enough to fill one shelf (11-50 books)	780	11
Enough to fill one bookcase (51-100 books)	1079	16
Enough to fill two bookcases (101-200 books)	1423	21
Enough to fill three or more bookcases (more than 200 books)	3193	47
Missing	79	1
Total	6825	100

Due to rounding, percentages may not sum to 100.

The relationships between background variables, SAT® scores and attainment are explored in section 5 and responses to the spring survey are presented in full in Appendix 1.

4.2.2 Additional information from the autumn survey

The autumn 2006 survey provided information on the post A level destinations for approximately 40 per cent of students from the main sample. The indicated destinations or plans of these 3177 respondents for the 12 months commencing autumn 2006 are presented in Table 4.7.

Table 4.7: Post-school destinations of the autumn 2006 survey sample

	Number	Per cent
Starting at university / other HEI in autumn 2006	2455	77
Deferred / guaranteed place at university / other HEI in autumn 2007 (gap year students)	285	9
Apprenticeship / Employment	190	6
Education (below HE)	108	3
Unemployed / Break from work and study	84	3
Missing	55	2
Total	3177	100

Due to rounding, percentages may not sum to 100.

Although these figures represent the destinations of only around 40 per cent of the main sample, the proportion of this sub-sample starting a course at an HEI in 2006 (77 per cent) corresponds closely to the equivalent figure from the spring survey, when around 75 per cent of respondents indicated that this was what they intended to do. A more detailed examination of the HE destinations of students in the sample will be presented in the 2008 report.

A further question asked those respondents commencing an HE course in 2006 to indicate the duration of their course, as shown in Table 4.8.

Table 4.8: Course duration for 2006 HE entrants in autumn 2006 survey sample

	Number	Per cent
1 year	48	2
2 years	22	1
3 years	1494	61
4 years	704	29
more than 4 years	180	7
Missing	7	0
Total	2455	100

Due to rounding, percentages may not sum to 100.

If similar proportions to those in Table 4.7 are true of the main sample as a whole, these figures suggest that in a year's time it will be possible to explore the relationships between SAT® scores, attainment and university destinations for approximately 86 per cent of the sample, around 6900 students. Taking into account the figures in Table 4.8, it is likely that, due to the number of students taking a gap year and those taking courses of more than 3 years duration, the number of students in the main sample completing their degrees in the academic year 2008/09 is likely to be around 3800, with a further 2200 students completing a degree one year later.

As reported in section 3.4 potential autumn survey participants were offered the opportunity to enter a prize draw in the hope that this would motivate them to complete a questionnaire (although they were not obliged to do so). It had been estimated that the response rate without an incentive would be approximately 33 per cent and that the incentive might increase this to up to 50 per cent of potential respondents. In the event the achieved response rate, as reported in the same section, was 38 per cent. It is difficult to assess the impact of the incentive, although with hindsight perhaps the initial estimates had been over-optimistic given the age and mobility of the sample.

However, on one measure at least it does not appear that the impact of the incentive was related to economic need as there was no significant difference in the autumn

survey between respondents and non-respondents grouped by their eligibility for free school meals – see Table 4.3 on page 17. If the incentive had been more effective with less advantaged participants, one would have anticipated that the proportion of respondents to the autumn survey eligible for free school meals would have increased relative to the proportion in the sample as a whole.

Survey respondents were also asked to indicate which of four potential incentives would most encourage them to complete a survey in the future. For these respondents a music or book token (value £5) sent with the questionnaire was the incentive indicated as being most likely to encourage them to participate. However, it is difficult to know whether this would also be the case with non-respondents. It would also be a much more expensive option than the prize draw.

Responses to the autumn survey are presented in full in Appendix 2.

5 Relationships between SAT® scores and attainment

In this section the analyses of the attainment and aptitude data are described and the relationships between the various measures are explored. The main study variables for each participant were their total A level score, their total GCSE score and their SAT® scores for Critical Reading, Mathematics and Writing. A description of each of these variables is given at the beginning of the relevant section below.

5.1 Descriptive statistics

5.1.1 Attainment data

In the analyses that follow, the attainment data for students in the sample was taken from a dataset supplied to the NFER by the DfES. The A level score used in the analyses was the total QCA point score for all Level 3 qualifications approved as A level equivalences. The points awarded under this system differ from the UCAS point scores: for example a GCE A level grade A is equivalent to 270 points (compared to 120 points using the UCAS tariff). For prior attainment the GSCE variables used in the analyses were the total KS4 point score and the average KS4 point score. Again the GCSE point scores are based on a new system (developed by QCA) in which a GCSE grade G is equivalent to 16 points and an A* grade is equal to 58 points. Further details of the scoring systems for both KS4 and KS5 qualifications and information about the discounting process (used to avoid double counting of qualifications such as GCE A and AS levels) can be found on the DfES website (DfES, 2006).

Table 5.1 shows the sample and national means for the key attainment measures and Figures 5.1 and 5.2 compare the score distributions of A level total scores and GCSE average scores for the main sample with those of the national population.

The main sample spans a wide range of ability but with a score distribution slightly skewed towards the upper range compared to the national population of A level entrants taking 2 or more GCE A levels. The mean A level points score of the main sample was 849. The mean A level total score for the national sample was slightly lower at 808.

Similarly the prior attainment of the main sample was slightly higher (an average 47 GCSE points) than that of the national population (46 points). The differences in means of the sample and the population are statistically significant. However, although the distribution of the main sample is skewed towards the high end (probably because of the number of students from grammar and independent schools) it broadly covers the same range as the population. The sample therefore contains sufficient cases from all areas of the population to enable reasonable conclusions to be drawn.

Table 5.1: Mean attainment scores – main sample

	Main sample		National population*	
	Mean	**s.d.**	**Mean**	**s.d.**
Total A level (or L3 equivalent) point score	***848.6***	260.4	***808.4***	235.8
Total GCSE point score	***489.9***	80.1	***469.0***	107.6
Average GCSE point score	***47.4***	6.0	***46.4***	5.5
	n = 8041		max n = 216343	

Values significantly different at the 5 per cent level are shown bold and in italics.

** 2005/06 GCE A level entrants taking 2+ A levels from the dataset supplied by DfES*

Figure 5.1: Banded A level score distributions for main sample and national population

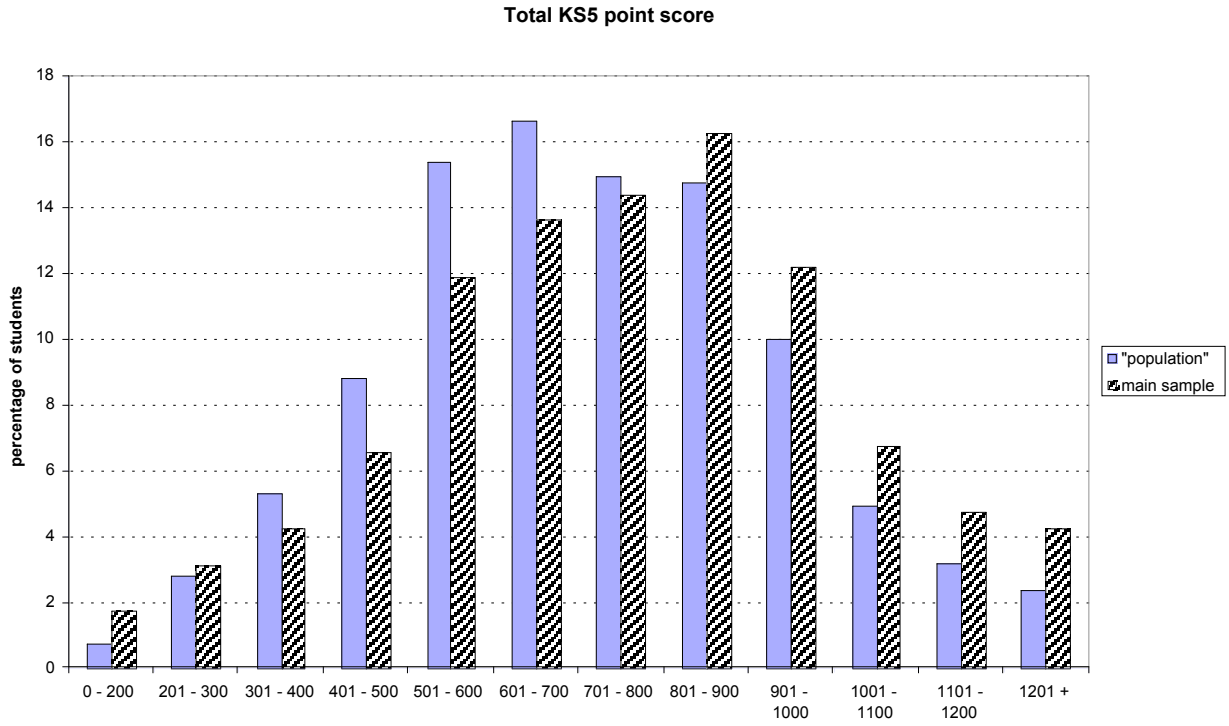
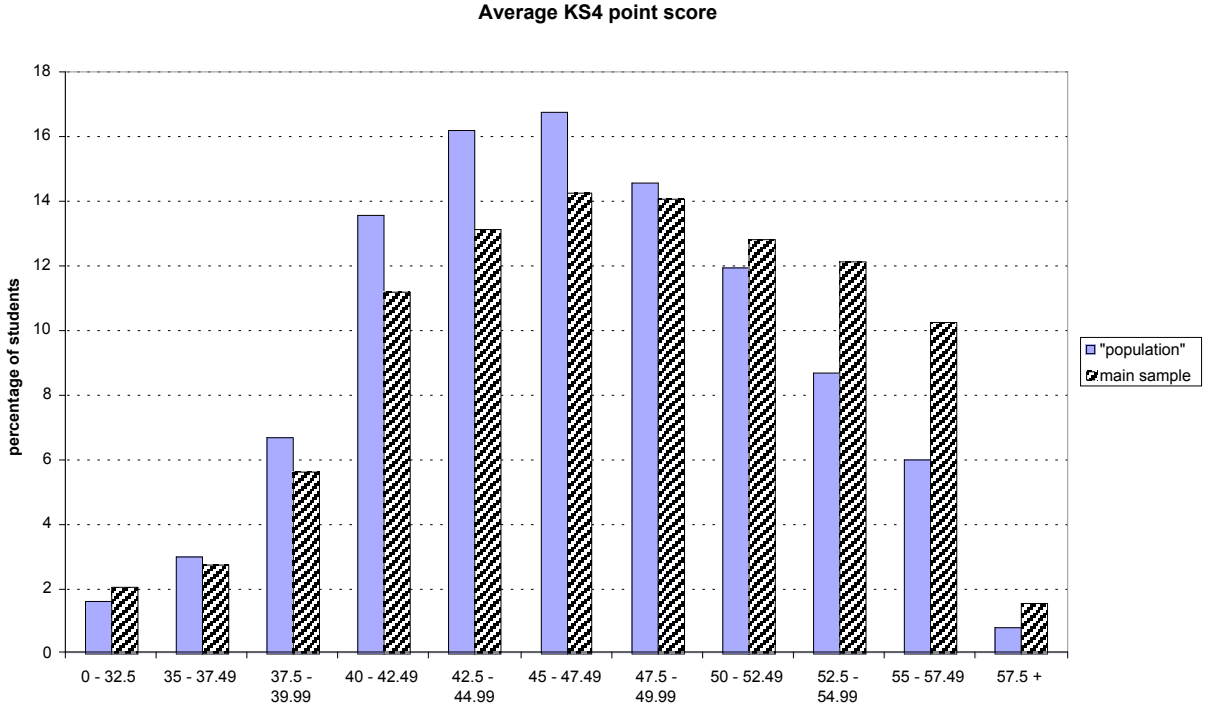


Figure 5.2: Banded GCSE average score distributions for main sample and national population



5.1.2 SAT® data

The raw SAT® scores of students who participated in the English trial were converted to scaled scores using the scoring metric of the US SAT®. SAT® scores for the main three components (Critical Reading, Mathematics and Writing) are each reported on a scale from 200 to 800. The multiple choice writing section counts for approximately 70 per cent and the essay counts for approximately 30 per cent of the total writing raw score, which is used to calculate the 200 to 800 score. Additional sub-scores are reported for the essay (ranging from 2 to 12) and for multiple-choice writing questions (on a 20 to 80 scale). Each essay is independently scored 1 to 6 by two "readers". These readers' scores are combined to produce the 2 to 12 scale. (If the two readers' scores differ by more than one point, the essay is sent to a chief reader for resolution. Essays that are not written on the essay assignment, or which are considered illegible after several attempts at reading, receive a score of 0.) The US mean or average scaled score for Critical Reading, Maths, and Writing is usually about 500.

Table 5.2 shows the means obtained on each of the main components of the SAT® and Figures 5.3 to 5.5 show the total score distributions for the Critical Reading, Mathematics and Writing components. For comparison purposes, the means and score distributions for over 1.4 million students in the US 2006 College-bound Seniors cohort are given (College Board, 2006).

Table 5.2: Mean SAT® scores – main sample and US 2006 cohort

SAT® component	Mean	s.d.	US mean	US s.d.
Critical reading	500	115	503	113
Mathematics	500	116	518	115
Writing	505	88	497	109
Writing: multiple-choice	49.1	9.4	n/a	n/a
Writing: essay	7.7	1.5	n/a	n/a
	n = 8041		n = 1,465,744	

As can be seen in the above table the means achieved are roughly comparable with US means, averaged over a number of administrations throughout the year using different versions of the SAT®. The means of a US sample that took the identical version to that of the English sample in March 2005 were considerably higher (526, 544 and 525 respectively). However, that was the first administration of the SAT® to include the essay component and attracted a very able group of candidates. (See Appendix 4 for a more detailed comparison of the two groups.)

Figure 5.3: Total score distribution for critical reading

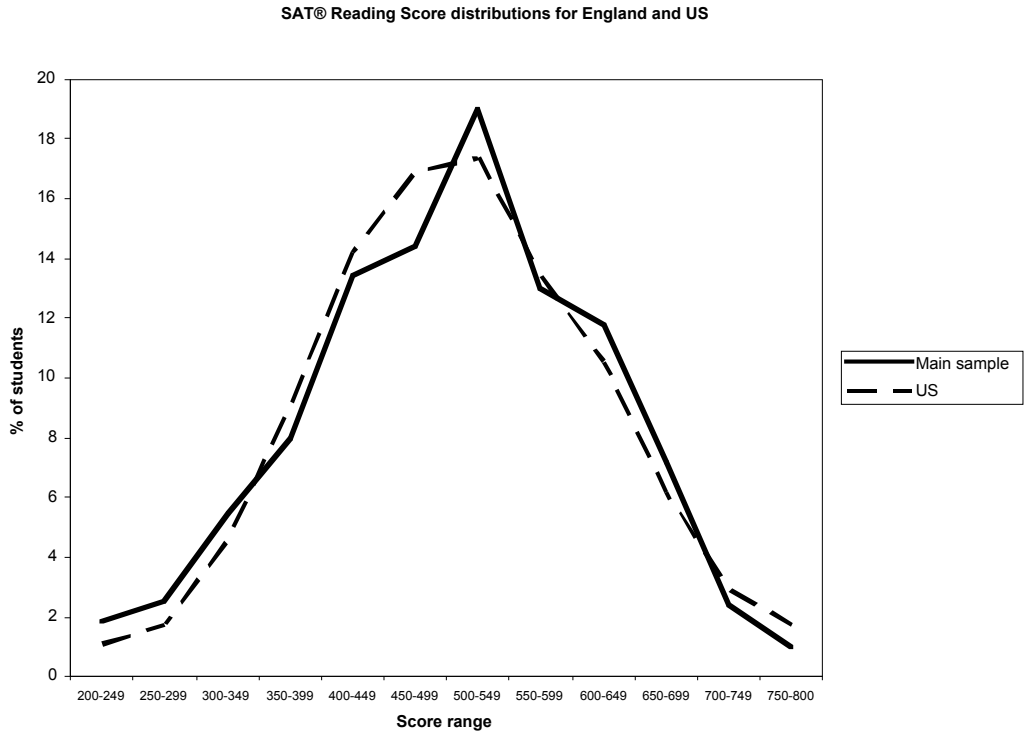


Figure 5.4: Total score distribution for mathematics

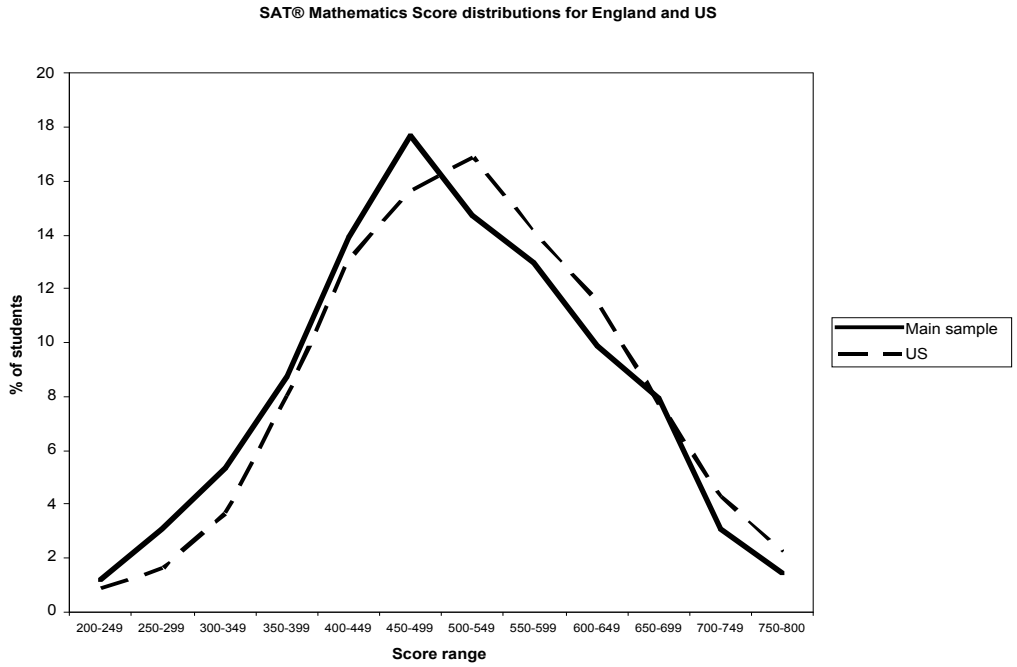
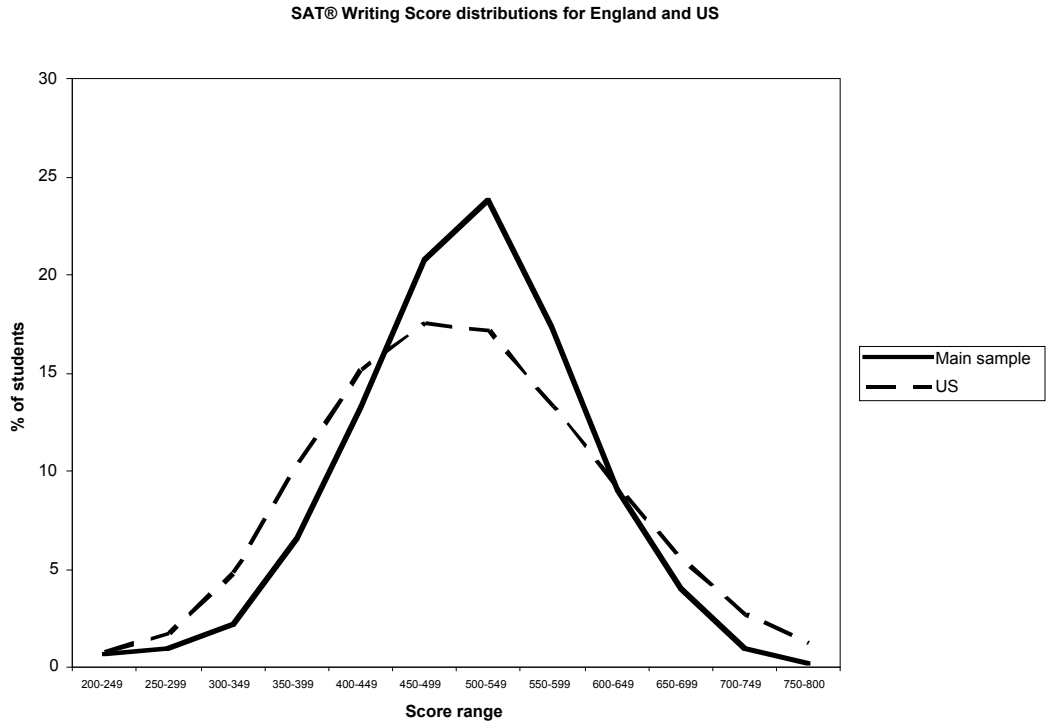


Figure 5.5: Total score distribution for writing



Much of the analysis of the SAT® data was carried out in summer 2006 following the receipt of the scores from the US. Descriptive statistics for the full UK SAT® sample of 9022 students (including means and score distributions for sub-groups) are

presented in Appendix 3. A full description of the analyses examining the functioning of the SAT®, as a complete test and at the individual item level, is presented in Appendix 4. Where data was available these analyses included comparisons with a sample of approximately 290,000 US students who took exactly the same version of the SAT® to see if there were any differences in performance that might indicate that the SAT® test was unsuitable for the English sample. Overall these results indicated that the individual SAT® items functioned in a similar way for the English and US samples.

Tables 5.3 to 5.7 give breakdowns of the main study variables – SAT® scores, A level scores and GCSE scores - by background variables. In most cases the differences between groups are statistically significant; which is to be expected given the size of the sample.

Table 5.3: Main study variables by gender

	Male	**Female**	**Total**
Number of cases	3692	4349	8041
% of cases	46%	54%	100%
Mean A level total score	***825.2***	***868.5***	***848.6***
Mean GCSE total score	***485.9***	***493.3***	***489.9***
Mean SAT® score	***505.3***	***498.4***	***501.55***
SAT® reading	497.6	501.7	499.8
SAT® mathematics	***523.3***	***480.3***	***500.0***
SAT® writing	***494.9***	***513.3***	***504.8***
Writing: multiple-choice	***48.5***	***49.6***	***49.1***
Writing: essay	***7.4***	***7.9***	***7.7***

Values significantly different at the 5 per cent level are shown bold and in italics.

It is interesting to note that females out-perform males, on average, at GCSE and A level and in the SAT® writing test, but the reverse is true for SAT® mathematics and in the SAT® test as a whole. It may be that this is due to the different mode of assessment, or else to the different subject balance.

The differences between male and female students on the various SAT® components are similar to the most recent results for students in the USA, where male students generally outperform female students in mathematics but do less well in writing (College Board, 2006).

Table 5.4: Main study variables by free school meal eligibility

	Not eligible	Eligible	Eligibility unknown
Number of cases	5953	243	1845
% of cases	74%	3%	23%
Mean A level total score	***828.0***	***665.5***	***939.3***
Mean GCSE total score	***490.9***	***454.8***	***491.2***
Mean SAT® score	***495.0***	***439.4***	***530.8***
SAT® reading	***492.7***	***444.3***	***530.0***
SAT® mathematics	***494.4***	***424.0***	***528.4***
SAT® writing	***498.0***	***450.0***	***534.1***
Writing: multiple-choice	***48.4***	***43.6***	***52.0***
Writing: essay	***7.6***	***7.1***	***8.0***

Values significantly different at the 5 per cent level are shown bold and in italics.

Clearly students known to be eligible for free school meals under-perform on all outcomes, on average compared with the other categories. Most of the students in the 'eligibility unknown' category were in independent schools. Therefore this classification will be confounded with the institution type classification presented in Table 5.7. In other words, the salient characteristic of such students in respect of attainment is probably that they were in independent schools and not that their eligibility for free school meals was unknown.

Table 5.5: Main study variables by ethnicity

	Asian	Black	Chinese	Mixed	White	Other	Not Known
Number of cases	670	117	116	145	6212	104	677
% of cases	8.3%	1.5%	1.4%	1.8%	77.3%	1.3%	8.4%
Mean A level total score	***766.7***	***690.1***	***956.0***	***836.9***	***851.5***	***793.9***	***922.9***
Mean GCSE total score	***477.3***	***456.9***	***477.6***	***487.2***	***491.8***	***505.1***	***491.1***
Mean SAT® score	***454.9***	***443.8***	***484.8***	***493.8***	***506.4***	***485.3***	***520.4***
SAT® reading	***436.6***	***436.8***	***445.1***	***493.2***	***507.5***	***478.1***	***516.6***
SAT® mathematics	***474.5***	***438.3***	***566.6***	***489.4***	***500.6***	***499.6***	***521.5***
SAT® writing	***453.6***	***456.2***	***442.8***	***498.9***	***511.0***	***478.3***	***523.1***
Writing: multiple-choice	***43.4***	***44.3***	***43.0***	***47.9***	***49.8***	***46.2***	***50.8***
Writing: essay	***7.4***	***7.2***	***6.9***	***7.9***	***7.7***	***7.5***	***7.9***

Rows which are shown bold and in italics imply that for this outcome some categories are significantly different from others at the 5 per cent level.

Clearly there are different patterns of performance for different ethnic groups. The most striking example is the Chinese group, who, on average, are the highest group in terms of A level and SAT® mathematics scores, but perform more poorly in SAT® reading and are the lowest group in SAT® writing. Asian and Black students achieved very similar mean SAT® scores whereas there was a much larger difference in A level scores between the two groups.

Table 5.6: Main study variables by English as an additional language (EAL) status

	Not EAL	EAL	EAL status unknown
Number of cases	5624	572	1845
% of cases	70%	7%	23%
Mean A level total score	***830.1***	***737.9***	***939.3***
Mean GCSE total score	***490.9***	***476.3***	***491.2***
Mean SAT® score	***497.8***	***443.9***	***530.8***
SAT® reading	***497.7***	***422.9***	***530.0***
SAT® mathematics	***494.0***	***467.8***	***528.4***
SAT® writing	***501.7***	***441.0***	***534.1***
Writing: multiple-choice	***48.8***	***42.3***	***52.0***
Writing: essay	***7.6***	***7.2***	***8.0***

Values significantly different at the 5 per cent level are shown bold and in italics.

A similar comment to that made in respect of free school meal eligibility (Table 5.4) can be made here. Those whose EAL status is unknown are the same individuals, mostly from independent schools, and therefore this classification will be confounded with the institution type classification shown in Table 5.7. As might be expected, differences between the performance of EAL and non-EAL students are least for the SAT® mathematics component.

Table 5.7: Main study variables by institution type

	Comprehensive school	Grammar school	Independent school	FE college
Number of cases	4200	1701	1800	340
% of cases	52%	21%	22%	4%
Mean A level total score	***755.0***	***977.5***	***942.1***	***864.8***
Mean GCSE total score	***478.8***	***515.1***	***494.0***	***479.0***
Mean SAT® score	***472.6***	***543.0***	***533.7***	***481.4***
SAT® reading	***470.3***	***541.3***	***533.2***	***480.0***
SAT® mathematics	***467.9***	***550.3***	***531.6***	***478.4***
SAT® writing	***479.6***	***537.4***	***536.4***	***485.7***
Writing: multiple-choice	***46.5***	***52.6***	***52.2***	***47.1***
Writing: essay	***7.4***	***7.9***	***8.0***	***7.5***

Rows which are shown bold and in italics imply that for this outcome some categories are significantly different from others at the 5 per cent level.

The general order of mean outcome scores shown above has comprehensive schools with the lowest scores, with FE colleges just above, followed by independent schools and grammar schools. In most cases there is no significant difference between comprehensive schools and FE colleges, or between independent and grammar schools. The exception is the total A level score, where the FE college mean is significantly higher than that for comprehensive schools, despite both having similar GCSE total scores.

Finally in this section, Table 5.8 shows the main study variables for a sub-sample of students who responded to the autumn survey and for whom we have information concerning their current activities. This information will be updated in the 2008 report when more complete HE destination data will have become available.

Table 5.8: Main study variables by current activity

	HE	Gap year	Other
Number of cases	2434	306	427
% of cases	77%	10%	13%
Mean A level total score	***955***	***881***	***824***
Mean GCSE total score	***516***	***500***	***488***
Mean SAT® score	***538***	***523***	***509***
SAT® reading	***540***	***530***	***514***
SAT® mathematics	***537***	***511***	***498***
SAT® writing	***535***	***527***	***515***

Rows which are shown bold and in italics imply that for this outcome some categories are significantly different from others at the 5 per cent level.

Those students already in higher education achieved significantly higher A level, GCSE and average SAT® scores compared to gap year students - they in turn performed significantly better than other respondents not currently considering HE, i.e. those in employment, education below HE, unemployed, etc. In terms of the separate SAT® components, there was no significant difference between the reading and writing scores of HE and gap year students. There was also no significant difference between the SAT® mathematics scores of gap year and other respondents.

5.3 Exploring the relationships between the main study variables

Table 5.9 below displays the correlations[3] between the GCSE and A level scores and between GCSE and A level scores and each of the SAT® scores.

Table 5.9: Correlations between GCSE and A level scores and SAT®

	A level total score	GCSE total score	Average GCSE score
Mean SAT® score	***0.64***	***0.54***	***0.70***
SAT® reading	***0.55***	***0.46***	***0.59***
SAT® mathematics	***0.54***	***0.48***	***0.60***
SAT® writing	***0.57***	***0.48***	***0.64***
Writing: multiple-choice	***0.55***	***0.47***	***0.62***
Writing: essay	***0.32***	***0.25***	***0.34***
A level total score		***0.58***	***0.76***
GCSE total score			***0.70***

Correlations significantly different from zero at the 5 per cent level are shown bold and in italics.

In the above table it is clear that the correlation between total SAT® score and A level total score is somewhat higher than with GCSE total score, but that the highest correlation with total SAT® is average GCSE score. Correlations with the different components of the SAT® are similar, except for the essay element which has much lower correlations with GCSE and A level outcomes (probably at least partly because of the relatively restricted range of the essay score).

The correlation of total A level points with average GSCE score is higher than with the total GCSE score. It is likely that this is because the number of GCSEs entered can

[3] Correlation: a measure of association between two measurements, e.g. between size of school and the mean number of GCSE passes obtained by each pupil. A positive correlation would occur if the number of passes increased with the size of the school. If the number of passes decreased with size of school there would be a negative correlation. Correlations range from -1 to +1 (perfect negative to perfect positive correlations); values close to zero indicate no linear association between the two measures.

vary widely and does not always reflect the ability of the student whereas at A level there is far less variation in the number of A levels attempted.

The higher correlation between SAT® and average GCSE score than between SAT® and A levels is in accordance with previous findings. In the pilot SAT® study carried out in 2000 in three groups of low-achieving, high-achieving and independent schools, (McDonald *et al*., 2001a), the correlation between the SAT® and mean GCSE grade was higher in all types of schools than between the SAT® and mean A level grade. At that time the correlations between mean GCSE grade and total SAT® score for high-achieving and low-achieving schools were 0.62 and 0.58 respectively and the correlations between SAT® score and mean A level grade were 0.45 and 0.50.

The SAT® as a whole has undergone some change since 2000, particularly the introduction of the writing components, and therefore one would expect a higher correlation between total SAT® scores and A levels than previously. Also there have been considerable changes to the A level system since the pilot; a greater number of subjects are now studied at A level and the structure of such courses is modular.

The high correlations between SAT® scores and attainment at GCSE and A levels are not unexpected given that each of these is measuring overall educational ability, albeit measuring different aspects and in different ways. Research generally shows similarly high correlations between different measures of educational ability. For example, Thomas & Mortimore (1996) found correlations of 0.72, 0.67 and 0.74 between Cognitive Abilities Test (CAT) scores in Year 7 and GCSE total points score, GCSE English grades and GCSE mathematics grades respectively. Correlations between measures of educational ability are also generally higher when such measures are administered in close proximity to one another, as is the case with the SAT® and the A level examinations.

The relationship between A levels and SAT® scores is complicated in that each of these measures is associated with prior attainment at GCSE. Controlling for average attainment at GCSE, the partial correlation between SAT® and A levels was 0.23. This suggests that, although SAT® and A levels are highly correlated, the underlying constructs that are being measured are somewhat different. This may indicate a potential for the SAT® to add to the prediction of HE outcomes from A levels, although the increment is likely to be relatively small. Whether this is indeed the case will not be known until such outcomes are available for students in the sample.

As yet, there has been insufficient time to carry out an analysis looking at the correlations between SAT® scores and the attainment of students grouped by the subjects studied at A level. This analysis will examine in more depth the extent to which A levels, in particular subjects, and the various components of the SAT® are measuring similar constructs.

Finally, an initial analysis was carried out to examine the relationships between the main study variables, a wide variety of background characteristics and post A level activities. From the autumn survey responses, participants were categorised as 2006

HE entrants, gap year students and Not-HE. Logistic regression models[4] were run to predict membership of these different groups based on attainment and background characteristics. When 2006 HE entrants were compared with all others, students from independent schools were less likely to be in the 2006 HE group compared to students from comprehensives. However the independent school variable was not significant when 2006 HE entrants and gap year students were together compared to the Not-HE group. A possible explanation is that students from independent schools are likely to go into HE but have the financial resources or support to enable them to take a gap year and therefore they are less likely to go to HE immediately. A small number of other variables were significant in the models but these were less easy to interpret. More sophisticated analyses may be required once we have information about the destinations of a larger number of students in the main sample.

The following two sections present data analysis which aims to explore two different issues:

- To what extent, and for whom, does the SAT® add relevant information about performance?
- Does the SAT® help to distinguish between those with three grade As or above at A level?

[4] Logistic regression is a technique which aims to predict the probability of an individual belonging to a certain group based on a range of background characteristics.

6 Disadvantaged students:

Can the SAT® identify students with the potential to benefit from higher education whose ability is not adequately reflected in their A level results because of their (economically or educationally) disadvantaged circumstances?

While it is not yet possible to address this question directly without having any measure of higher education outcomes, it is possible to look at a couple of related questions:

- What are the characteristics of students with more inconsistent performance measures?
- Do particular types of student perform better in the SAT® than would be predicted from their A level (and possibly GCSE) results?

In the past, an argument that has been put forward for the SAT® is that it measures aptitude rather than attainment and is therefore less dependent on a student's socio-economic background and schooling - although the evidence does not unequivocally support this view (see McDonald *et al.*, 2001b). However, if this is the case, and assuming A levels do not adequately reflect the ability of some disadvantaged students, it would be likely that such students might exhibit inconsistent performance, i.e. perform better on the SAT® than in their A levels.

The thinking here is that it is only those with inconsistent performance who would be likely to benefit from the introduction of SAT®; those whose overall performance is well-reflected by A level would not be affected by the additional measure.

To explore this question a measure of "inconsistency" was devised across the three available performance measures, namely:

- mean SAT® score
- A level total point score
- GCSE total point score.

Each of the above is measured on a different scale, so in order to compare scores across the different outcomes these were 'standardised' – each was converted to a scale with a mean value of 100 and standard deviation of 15 across the 8041 cases in the main sample. Extreme outliers were excluded by truncating the standardised scores at 59 and 141. Once this is done, a highly 'consistent' student would be expected to score approximately the same standardised score across all the measures - if they scored 85 on their GCSE standardised score (one standard deviation below the

mean) they would score about the same on all the others. An 'inconsistent' student would have more variability in their standardised scores.

By taking an average score to represent performance on the SAT® as a whole, any inconsistencies across the different components of the SAT® reported previously, for example by Chinese students (see Table 5.5), were reduced.

The simplest measure of inconsistency was taken as the range of standardised score values, i.e. the difference between the highest and lowest standardised score for each student. Table 6.1 gives an example of this calculation for two hypothetical students.

Table 6.1: Calculation of inconsistency measure for two students

Standardised scores	Student A	Student B
mean SAT® score	83	72
A level total point score	88	85
GCSE total point score	84	119
Highest standardised score	90	119
Lowest standardised score	83	72
Inconsistency measure (range)	7	47

In the above table, Student B exhibits inconsistent performance because there is far more variability in his/her standardised scores, illustrated by an inconsistency measure of 47 (the difference between 119 and 72).

For the main sample, the inconsistency measure varied from a value of 0 to 80, with a mean value of 15. In order to explore this inconsistency in performance further, it was analysed with respect to background factors. To do this in a valid way it was necessary to consider all background characteristics together, rather than one at a time. (As some of these factors are strongly related to each other considering one at a time may give misleading results.)

A regression[5] model was fitted, to look at the relationship between the inconsistency measure and background characteristics – sex, ethnicity, eligibility for free school

[5] Regression analysis (linear): this is a technique for finding a straight-line relationship which allows us to predict the values of some measure of interest ('dependent variable') given the values of one or more related measures. For example, we may wish to predict schools' GCSE performance given some background factors, such as free school meals and school size (these are sometimes called 'independent

meals, English as an additional language and institution type. Results of this regression are shown in Table 6.2, which shows the coefficients for background characteristics that were significant at the 5 per cent level. The coefficients give the expected change in the inconsistency measure from the 'default' category to the given category, where the 'defaults' were taken as male, white, not FSM, not EAL, in a comprehensive school. In other words a negative coefficient indicates less inconsistency in performance than the default category and a positive coefficient indicates greater inconsistency than the default.

Table 6.2: Significant coefficients of regression model to predict inconsistency of performance

Background Characteristic (v. default)	Coefficient
Female (v. male)	-0.5
FSM (v. not FSM)	+1.6
Chinese (v. white)	+3.6
Ethnicity unknown (v. white)	+1.3
EAL	+1.8
Grammar school (v. comprehensive)	-1.9
Independent school (v. comprehensive)	-1.7
FE college (v. comprehensive)	+3.3

From the above table it appears that female students tend to be more consistent (less inconsistent) in their performance than male students and that students in grammar and independent schools tend to be more consistent in their performance than comprehensive school students. Conversely, Chinese students, students eligible for free school meals, those learning English as an additional language and students from FE colleges tend to be less consistent (more inconsistent) than the default categories. The inconsistency analysis showed that such students were more likely to have inconsistencies between the SAT®, A levels and GCSEs but did not show that these were systematically in any particular direction. A similar model using an inconsistency measure related to standard deviation rather than range produced the same significant coefficients.

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variables'). When there are several background factors used, the technique is called multiple linear regression.

For the second part of this analysis the focus was on individuals who had better than expected SAT® scores, given their performance at A level (and at GCSE) – in order to examine the characteristics of such students. To explore this, another regression model was run, this time with average SAT® score (across reading, mathematics and writing) as the outcome, and total A level score as one of the background factors, as well as all the other factors used in the previous regression. The idea here was that, having controlled for A level score, the other coefficients would indicate categories of students who perform better or worse on the SAT® than might be expected. Table 6.3 contains the coefficients of two analyses, one controlling for A level total score and one controlling for both A level total score and mean GCSE score.

Table 6.3: Significant coefficients of regression model to predict higher or lower than expected SAT® performance

Background Characteristic (v. default)	**Coefficient (A level only)**	**Coefficient (A level + mean GCSE)**
A level (***per point achieved***)	+0.21	+0.08
GCSE (***per point achieved***)	-	+8
Female (v. male)	-17	-22
Asian (v. white)	-27	-26
Black (v. white)	-22	-
Chinese (v. white)	-47	-33
Ethnicity unknown (v. white)	-14	-10
SEN (v. no SEN)	-20	-10
EAL (v. no EAL)	-13	-9
Grammar school (v. comprehensive)	+21	+9
Independent school (v. comprehensive)	+30	-
FE college (v. comprehensive)	-13	-

For the model predicting overall SAT® score, controlling just for A level results without GCSE included, the explanatory power was such that 44.7 per cent of the variance in the SAT® outcome was explained ($R^2 = 0.447$). When GCSE average score was also included in the model 49.5 per cent of the variance was explained ($R^2 = 0.495$).

Results were largely similar whether GCSE was included in the analysis or not. Females, ethnic minorities and those with special educational needs or English as an additional language appeared to perform less well on the SAT® than expected, compared in each case with the default group, and students in grammar schools seemed to perform better on the SAT® than might be expected from other results. Students in independent schools also did better than expected when A level results were taken into account and Black students and students in FE colleges worse than expected. In each case they neither did better nor worse than expected when prior attainment at GCSE was also taken into account.

Care must be taken in interpreting these results because of the ceiling effect of A levels. Under the current system a certain number of points are allocated for each grade rather than using raw examination marks. Although the range of marks within the A grade band may vary widely, all students achieving an A grade are awarded the same number of points. Therefore, one possible explanation for the findings relating to grammar schools and independent schools is that students appear to do better than expected on the SAT® because their A level attainment is capped. The effect is much reduced once GCSEs - where less of a ceiling effect occurs - are taken into account.

The free school meals eligibility indicator is often viewed as a proxy for disadvantaged circumstances. However, eligibility for free school meals was not significant in either of these analyses when attempting to predict average SAT® performance, i.e. there was no tendency for students eligible for free school meals to perform better (or worse) in the SAT® than in the other two attainment measures. However, when the regression model controlling for both A level total score and mean GCSE score was run for each of the three main SAT® components separately, students known to be eligible for free school meals did better than would be expected on the SAT® reading component compared to students that were not eligible. In other words students eligible for free school meals tended to achieve higher reading scores than non-eligible students with similar attainment at KS4 and KS5. However, in both regression analysis models to predict higher or lower performance in the SAT® mathematics component, eligible students did worse than expected.

Generally, the results of the analyses of the separate components were similar to those for the SAT® as a whole. The only other exceptions were that Chinese students did better than might be expected in mathematics and female students did better in writing.

6.1 Conclusions

Without higher educational outcomes it is not possible as yet to answer the question as to whether the SAT® can identify students with the potential to benefit from HE whose ability is not adequately reflected in their A levels because of their disadvantaged circumstances.

The current analysis has revealed that:

- Chinese students, students from FE colleges and students eligible for free school meals or learning English as an additional language tend to show greater inconsistencies in performance between the SAT®, A levels and GCSEs compared to default groups (white, students from comprehensive schools, etc) but these are not systematically in any particular direction.

- Taking into account their KS4 and KS5 attainment, female students, ethnic minorities and those with special educational needs or learning English as an additional language appear to perform less well on the SAT® than expected and students in grammar schools seem to perform better on the SAT® than might be expected.

These results should be treated with caution until more sensitive analyses have been conducted. One of the problems with using categories such as eligibility for free school meals in the analysis was that only a very few students were known to be eligible and, for many students, information as to eligibility was missing. The intention is now to carry out more complex statistical modelling of this and additional data. This more detailed examination of social, educational and economic background variables will utilise data on the attainment of the institutions attended, census data relating to the home postcodes of students in the sample and, where available, information supplied by the students themselves (e.g. parental education). Although no final conclusions regarding this research question can be reached until we have HE outcomes for students in the sample, this further analysis may reveal more about the performance of students across the SAT®, A levels and GCSEs according to more sensitive measures of economic and educational disadvantage.

7 High-achieving students:

Can the SAT® distinguish helpfully between the most able applicants who get straight As at A level?

This section of the report presents the findings relating to those students who achieved at least three A grades at A level. Three A grades was chosen as a particular benchmark as being the level now required to gain entry to some leading UK universities. There were 1402 such individuals, 17 per cent of the main sample, broken down as follows:

Table 7.1: Frequencies of students with three or more grade As at A level

Number of grade As at A level	Frequency	Per cent
3	835	59.6
4	437	31.2
5+	130	9.3
Total	1402	100.0

Due to rounding, percentages may not sum to 100.

A comparison of the background characteristics of this group of students compared to the main sample is given in Table 7.2.

In terms of their background characteristics, a higher percentage of female students achieved three or more As at A level compared to the percentage of female students in the sample as a whole. Only one per cent of those students who achieved three As at A level were eligible for free school meals compared to approximately three percent in the sample as a whole. Hence, there were only nine students out of a total of 243 students eligible for free school meals in the three As group. Chinese students were the only ethnic group that proportionally increased in the three As group, along with those students whose ethnic origin was missing (generally students from independent schools). Finally higher percentages of grammar and independent school students were found in this category than in the sample as a whole and a much lower proportion of students from comprehensive schools.

Table 7.2: Background characteristics of the sub-sample of students with three or more grade As at A level

		Main per cent (n = 8041)	Three As per cent (n = 1402)
Sex	Male	46	39
	Female	54	61
Ethnicity	Asian or Asian British	8	7
	Black or Black British	1	1
	Chinese	1	2
	Mixed	2	1
	White	77	70
	Other	1	1
	Missing	8	18
EAL	No	70	48
	Yes	7	4
	Missing	23	48
SEN	No provision	92	89
	School Action (A)	2	2
	School Action Plus (P)	0	1
	Statement of SEN (S)	0	0
	Missing	5	9
FSM eligibility	No	97	99
	Yes	3	1
Post-16 institution type	Comprehensive schools	52	20
	Grammar schools	21	29
	Independent schools	22	48
	FE / sixth form colleges	4	3
Total		100	100

Students who had gained three or more grade As at A level achieved significantly higher scores than the rest of the sample on all subtests of the SAT®. As one might expect, they also differed significantly from the rest of the sample in terms of their prior attainment (GCSE total point score).

Correlations between the GCSE and A level scores and each of the SAT® scores for these students were also examined. The correlations between the different measures for this sub-sample of students were lower than those given in Table 5.9 for the main sample due to the restricted range of GCSE and A level scores within this group. Apart from within test correlations, the strongest correlation was between the SAT® total score and the average GSCE points score (0.44). The correlations between the SAT® total score and the GCSE and A level total points scores were 0.32 and 0.31 respectively. These were all higher correlations than that between the A level and GSCE total point scores (0.25).

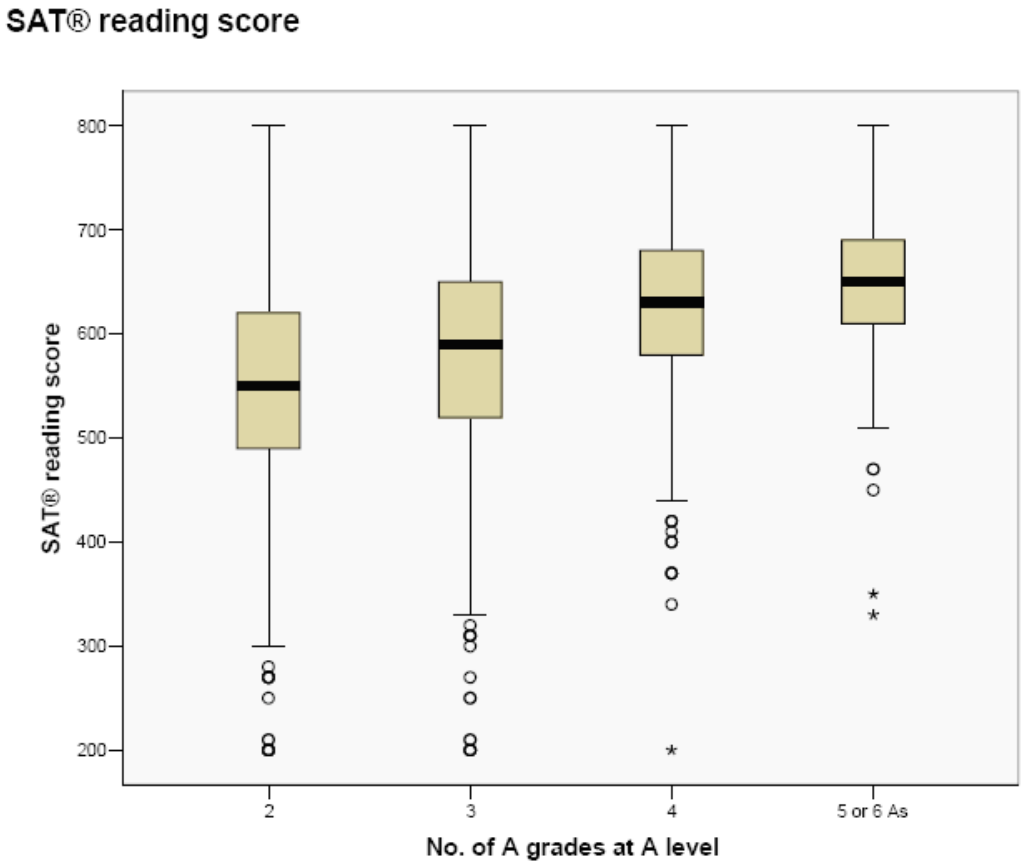
An important aspect of the analysis was to consider the extent to which students who achieved three or more A grades at A level achieved similar scores on the SAT® test, i.e. was the SAT® able to differentiate between them or were their scores clustered together. For this part of the analysis a further group of 838 students who achieved two A grades were also included. The ranges of scores on the different SAT® components for these students, grouped by the number of A grades at A level achieved, are presented in Figures 7.1 to 7. 3. Table 7.3 summarises the median, minimum and maximum SAT® scores for each group of students.

Table 7.3: SAT® medians and score ranges by A grades at A level

	Critical Reading	Mathematics	Writing
2 A grades	560	540	550
	280-800	250-800	370-710
3 A grades	600	585	570
	320-800	310-800	370-760
4 A grades	630	640	610
	420-800	400-800	430-770
5+ A grades	650	670	620
	510-800	490-800	460-780

score ranges exclude outliers and extreme values

Figure 7.1: SAT® reading score by number of A grades at A level[6]



[6] Box and whisker plots give a visual display of summary statistics. The median is represented by the black horizontal line. The box denotes the upper and lower quartiles (75th and 25th percentiles). The vertical lines (whiskers) extend to minimum and maximum values with outliers (values between 1.5and 3 box lengths from the upper or lower edge of the box) and extreme values (values more than 3 box lengths from the upper or lower edge of the box) displayed beyond.

Figure 7.2: SAT® mathematics score by number of A grades at A level

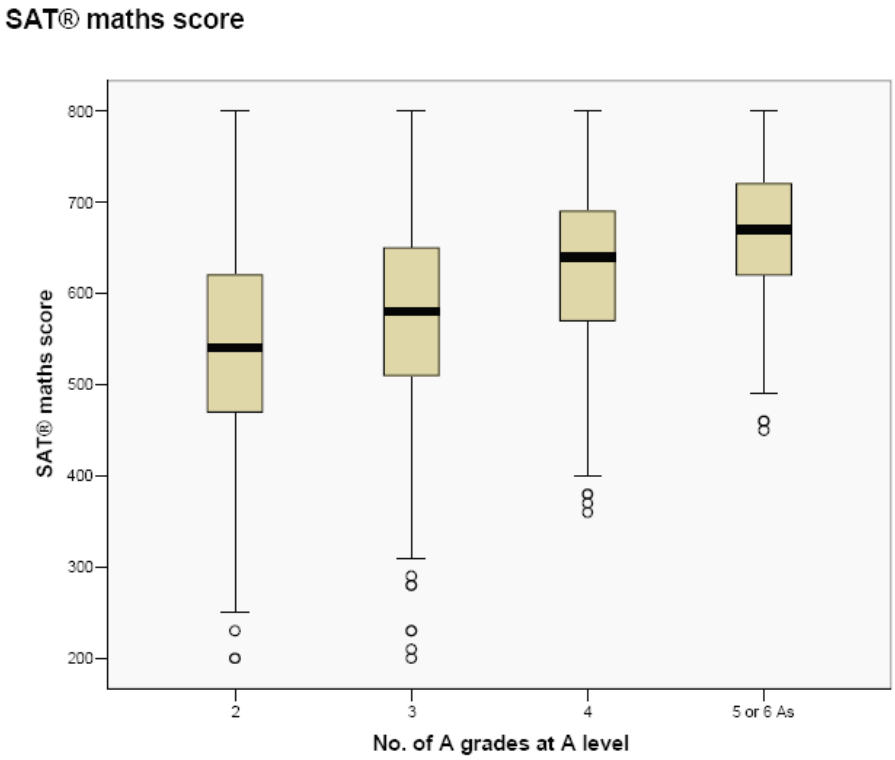
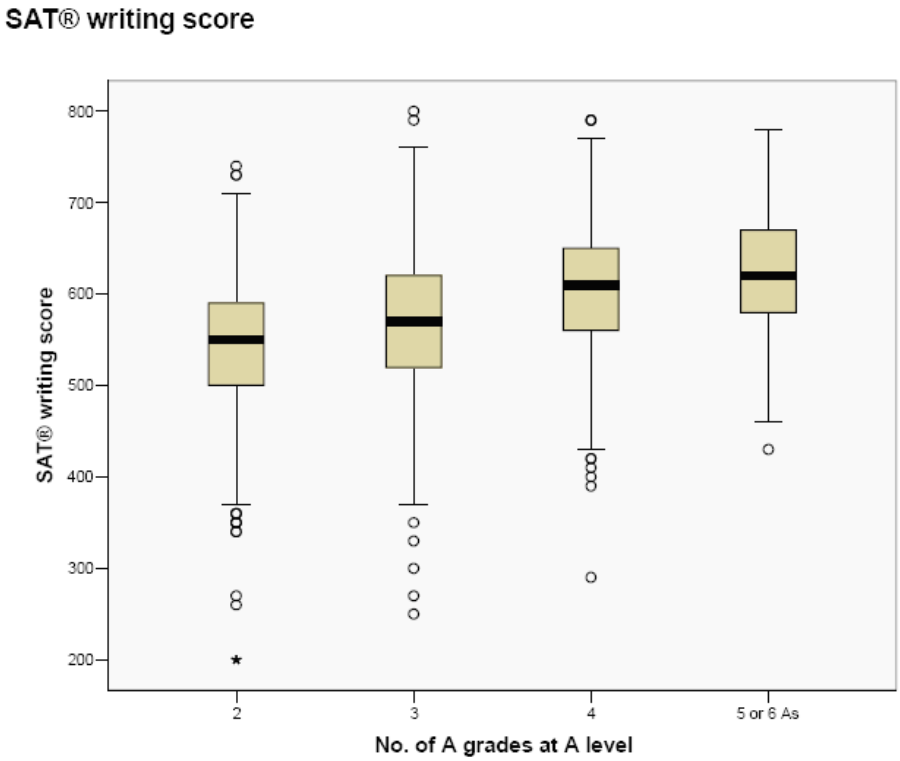


Figure 7.3: SAT® writing score by number of A grades at A level



As can be seen from the figures above there were wide variations in SAT® scores amongst these students, particularly those with two or three A grades at A level. Variation was greatest in the reading and mathematics scores. This suggests that an aptitude test such as the SAT® might offer scope for distinguishing between candidates with similarly high A level grades, particularly amongst students who are prevented by their schools or colleges from attempting more than three full A level courses.

However, the usefulness of using the SAT® in addition to A levels to select candidates for admission to HE courses cannot be established until the relationship between SAT® scores and degree outcomes is known. It is hoped that this research study will be able to shed some light on this issue in due course. It is also possible that differentiation might be achieved in other ways, for example by using the raw marks achieved by students in their A level courses rather than grades.

In order to investigate the characteristics of these high-achieving A level students some analysis was carried out using logistic regression. This analysis included both the separate SAT® subject scores and the background characteristics investigated in the previous sections of this report.

It was found that, of the different SAT® components, the best predictor of whether a student had achieved three A grades was the mathematics score – the strength of the relationship was about twice that of any of the other SAT® scores. Controlling for SAT® score, the other factors which appeared to increase the probability of obtaining three or more A grades were:

- being female
- being of Asian, Chinese origin or unknown ethnic group (compared to white students)
- attending an independent school (strongest), or grammar or FE college (compared to attending a comprehensive school).

Of these factors, attendance at an independent school was the strongest.

The reason that the mathematics score was more useful in predicting whether a student obtained three or more A grades requires further more detailed examination. Future analyses will consider sub-samples of students grouped by subjects studied at A level in order to ascertain whether the relationship between SAT® scores and A levels is reasonably consistent across different groups or whether some SAT® components may predict 'success' in some subjects but not others.

One outcome from the regression model was a table showing the number of students that were correctly or incorrectly predicted to get three or more As at A level from their SAT® scores and background characteristics. Of the 8041 students 87 per cent were correctly placed; 95 per cent of the students who did not achieve three or more A grades and 45 per cent of those who did. Of the 1402 students who achieved three or

more As at A level, 775 would not have been predicted to have done so. There were a further 303 students who would have been predicted to achieve three or more As at A level that did not in fact do so. The aim of the study is not to see if the SAT® can predict A level attainment but to ascertain whether the addition of the SAT® can better predict higher education outcomes than A levels alone. However, this is an interim exercise to show that the SAT and A levels are measuring similar but not identical constructs. If the model was able to correctly predict almost everyone, it would suggest that the SAT® and A levels are measuring the same thing. Conversely, if the prediction levels were too low, there would be a concern that the SAT® was not measuring educational aptitude.

A further regression analysis was carried out using average GCSE score, as well as SAT® scores and background characteristics, to predict three or more A grades at A level. In this case the most important factor in predicting three grade As was average attainment at GCSE. (A similar model substituting total points for average GCSE score showed that the GCSE total points figure was much less useful as a predictor.) Although much less important than prior attainment in predicting three or more A grades, the reading, mathematics and essay components of the SAT® were also significant factors. Again this may suggest that they are measuring a slightly different construct than GCSEs. Controlling for SAT® scores and prior attainment, the significant background variables that increased the probability of obtaining three A grades were:

- attending an FE college (compared to a comprehensive)
- eligibility for free school meals unknown (probably students mainly at independent schools)
- learning English as an additional language (at this stage of their education their fluency in English is not likely to be a significant barrier).

To look at this group of students in a slightly different way the following questions were examined:

- What were the background characteristics of students that achieved high scores on the SAT® but were not part of the three A grades A level group?
- What were the background characteristics of students that ***did not*** achieve high scores on the SAT® but ***were*** part of the three A grades A level group?

To explore this issue all students in the main sample were split into three groups according to their total SAT® score; the higher group representing the top five per cent of scores and the high group the next ten per cent of scores. Each of these groups was further split into two according to whether students had achieved three or more A grades at A level as shown in Table 7.4.

Table 7.4: SAT® scores by number of A grades at A level

Total SAT® score	A levels with 3+ A grades				Total
	No		Yes		
Low (600-1790)	6144	(90%)	706	(10%)	6850
High (1800-1950)	404	(49%)	414	(51%)	818
Very high (1960+)	91	(24%)	282	(76%)	373
Total	6639		1402		8041

This found 495 students with a high or very high SAT® score who did not achieve three or more As at A level. There were also 706 students that did not do so well on the SAT® who did achieve three or more A grades. The background characteristics of these two groups were then examined.

A higher proportion of male students compared to females were in the high SAT® performance categories, but achieved less than 3 As at A level. In particular 65 of the 91 students with very high SAT® scores were male. Conversely more females than males achieved three A grades in the 'low' SAT® category. It is interesting to note that some male students did extremely well on what was for them a low-stakes test, even though they did not subsequently achieve three A grades at A level. Whether this is due to the content of the SAT® or the nature of the assessment (examination only and mainly multiple-choice) is not known. The relevance of this finding and whether the additional information offered by the SAT® would be useful to HE admissions staff will depend on whether the combination of these scores will better predict university outcomes than A levels alone. This will not be known until data as to the HE attainment of these students becomes available.

Compared to comprehensive schools, more students from independent and grammar schools in the low SAT® group achieved three As at A level. There were also more students from these schools in the groups with both high SAT® scores and grade As at A level. Within the main sample as a whole, students in grammar schools were more likely to obtain three or more A grades at A level compared to comprehensive students (as reported on page 45). However, amongst students with high or very high SAT® scores, the percentage of grammar school students who did not achieve three A grades was slightly higher than would be expected. This tendency was true both for male and female students but more noticeably amongst male students - although the numbers in these sub-groups were fairly small.

Students for whom information was missing concerning English as an additional language and eligibility for free school meals (largely students from independent schools) were more likely to achieve A grades compared to all other groups of

students. Students learning English as an additional language and students eligible for free school meals were more likely to achieve low outcomes on both measures.

7.1 Conclusions

Amongst a sub-sample of students with three or more A grades at A level there were wide variations in SAT® scores. This suggests that the SAT® might offer scope for distinguishing between candidates with similarly high A level grades.

Although there was considerable overlap between attainment at A level and SAT® scores, a substantial number of students did better on one measure than the other. Some students, who might have failed to gain admission to the most prestigious universities on the basis of their A level grades, nevertheless achieved scores in the top 15 per cent or even top five per cent of SAT® scores. On the basis of the current analysis the sub-group of potentially able students who might benefit most from the SAT® would be male students. As discussed at the end of section 6, other sub-groups who might potentially benefit may be identified using more complex statistical modelling of the data.

In due course when HE outcomes become available, another important sub-group to consider will be those whose attainment at both GCSE and A level was high but who performed poorly on the SAT®.

If the SAT® alongside A levels can be shown to better predict university outcomes, the SAT® might offer a means of enabling differentiation between students with the same grades, as well as an alternative measure of ability for those students who for whatever reason fail to show their full potential by means of A levels.

8 Questionnaire findings

Two questionnaire surveys have been conducted to gather qualitative data about the student sample. The background characteristics of the survey sub-samples are described in section 4.4 and copies of the questionnaires annotated with students' responses are given in Appendices 1 and 2. This section presents a summary of the key findings from the two surveys.

8.1 Spring 2006 questionnaire

As reported in section 3.3, over 6800 students took part in the spring 2006 questionnaire survey. As well as providing some background details about their home and family circumstances, the questionnaire asked them about their experiences of school or college in years 12 and 13, their immediate plans after A levels and their views of higher education.

8.1.1 Future Plans

The questionnaire contained questions about their plans after A levels and their aspirations in terms of future careers.

- Ninety-two per cent of the students who completed the survey indicated that they would definitely or probably go to university in either 2006 or 2007. Seventy-four per cent expected to commence a degree course in 2006, with a further four per cent on a foundation course and 17 per cent taking a gap year.

- Students with a parent who had been to university were more likely to say that they *definitely* intended to go to university than students with a parent who had left school at age 18 and they, in turn, were more likely to say they *definitely* intended to go to university than students with a parent who had left school at age 15 or 16.

- Regarding sources of information about higher education, over 90 per cent had looked at university produced information (website, prospectus or CD) and over 80 per cent had been to a university open day.

- Most students indicated that the vast majority of students in their year group were also planning to go to university. However, over 800 students estimated that about half or less of their year group was intending to go to university.

- About 60 per cent of the students were *absolutely certain* or *fairly certain* what job they would like to do in the future. The most popular careers were medicine (15 per cent); engineering, science and IT (14 per cent); health and social welfare, such as social work, nursing and the police force (12 per cent); and teaching (11 per cent).

At the stage at which these responses were given these career choices and the associated degree paths represented students' aspirations. In the next phase of the

project actual destinations will be examined and the extent to which students' aspirations have been achieved will be explored.

8.1.2 Views on university

All students were asked to give their views of university, irrespective of whether they intended to go or not. Students gave views by indicating agreement with a number of statements on a five point scale (*strongly agree, agree, not sure, disagree, or strongly disagree*[7]).

- Over 80 per cent of students indicated that they would enjoy studying for a degree, that their parents / carers would be pleased if they went to university and that most of their friends were going.

- Twenty-three per cent of students were not sure whether their results would be good enough to go to university, but only three per cent did not think that they would be good enough.

- Thirteen per cent of the questionnaire sample agreed with the statement *I don't think I can afford to go to university*.

- The most popular reasons for applying to university were interesting subjects / courses (86 per cent), social life (65 per cent), more interesting jobs / careers (65 per cent), requirement of chosen career (63 per cent), earnings potential (58 per cent).

- Over 120 institutions were cited as the preferred choice for higher education. The five institutions most frequently cited were the universities of Manchester, Leeds, Birmingham, Nottingham and Cambridge.

- The most important reasons for selecting a particular university to study at were: good academic reputation (75 per cent), facilities (74 per cent), location (67 per cent), social life (62 per cent), graduate employment prospects (49 per cent), best available course (48 per cent).

8.1.3 Views on school

Students also gave views of their school or college and their current studies, again by indicating agreement with a number of statements on five point scales. Generally such opinions were positive.

- Most students (79 per cent) found the work at school or college interesting and very few (4 per cent) regretted staying on after year 11.

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[7] In this summary the percentage agreement / disagreement figure represents those students who *agreed* and *strongly agreed* with a statement or who *disagreed* and *strongly disagreed* respectively.

- Approximately 90 per cent of students agreed with the statement: *My studies at school / college will help me in the future*, suggesting that they considered their courses to be relevant to their intended careers or could see the importance of the transferable skills they were acquiring. However, only 50 per cent of students felt that they had been given good advice when choosing their A levels.

- Just over 50 per cent of students did not think that their AS level results reflected their true ability. The most popular reasons given were not doing enough work (69 per cent), personal circumstances (25 per cent), not enjoying the work (24 per cent) and the quality of teaching (19 per cent).

- Most students were happy with the quality of the teaching they received. Less than eight per cent thought the teaching was poor and only a small proportion, just over six per cent, thought that their school or college was not a good place to study.

8.1.4 Careers advice

Students were also questioned about the advice given to them by their school or college to help them make the right decisions for the future.

- Over 40 per cent of students rated the careers advice they had been given as *helpful*, but over 20 per cent of students had not found the advice helpful or claimed not to have received any.

The students were asked specifically about how well their last two years at school had prepared them for the future. Each aspect was rated on a four point scale from *very well* to *not at all well*.

- Over 90 per cent indicated that their education in year 12 and year 13 had equipped them with useful skills and knowledge.

- Over 80 per cent had been given helpful information about university but less than 50 per cent felt they had been given good information about jobs and training or encouraged to look into vocational training.

- Although the majority of students thought their school had prepared them for studying at university, a sizeable proportion thought they were *not very well* prepared (24 per cent) or *not at all well* prepared (4 per cent).

8.1.5 Students not intending to go to university

Approximately 500 students (8 per cent of the questionnaire sample) indicated they would *probably not* or *definitely not* go to university. The most common reasons were wishing to pursue a job or career that did not require a degree (38 per cent), worries about debt and finance (38 per cent) and having no desire to study further (32 per cent).

An analysis of the students who indicated that they were unlikely to go to university suggested that very few students in the higher end of the ability range were allowing worries about debt to prevent them from planning to go on to higher education. Although the number of students involved is very small, this issue will be examined again in the 2008 report with actual post A level destinations.

8.1.6 Opinions of the SAT Reasoning Test™

Students were asked their opinion as to whether the SAT® was likely to better reflect their true ability than their AS results. Over half of those who responded indicated that it would not, approximately one third were unsure and a small percentage thought that it would.

Approximately half of the students who completed a questionnaire took the opportunity to write an open comment on the SAT®. Although four per cent of such responses were positive, the most common comments stated that the SAT® was repetitive, boring or long (22 per cent) or that it was irrelevant to their current studies (11 per cent).

8.2 Autumn 2006 questionnaire

A smaller number of students (approximately 3300) took part in the autumn questionnaire survey, and of these 3177 responses were used in the analysis (as part of the main sample). This second questionnaire filtered participants into answering particular questions depending on their intentions with regard to higher education: entering HE in 2006; taking a gap year with a deferred place in 2007; or no intentions / immediate plans for HE. The following summary groups the findings accordingly.

8.2.1 HE entrants in 2006

Over three quarters of the autumn survey sample (2455 students) indicated they had started a course at an HEI in autumn 2006.

- Eighty-six per cent of these students had obtained their first choice of HEI, six per cent had gained their second choice and eight per cent had obtained a place through the clearing system.

- As reported in section 4.2.2, approximately 60 per cent of these 2455 students had commenced a course of three years' duration, and a further 30 per cent were on a four year course.

- Over 80 per cent were planning to live in a hall of residence during their first year.

- Over 95 per cent were *fairly confident* or *very confident* of their ability to complete the course.

- When asked about how they were planning to cover their total expenses during the year (including course fees, accommodation, food, etc), over 90 per cent indicated

they would have to take out some form of loan that would need to be repaid. Almost half of all respondents indicated that this would be in excess of £4000.

8.2.2 Gap year students

A small number of students in the survey sub-sample (285) planned to take a gap year and had a guaranteed or deferred place at an HEI for autumn 2007.

- Students were asked to indicate which activities they were planning to do during their gap year from a range of seven options. The two most popular options were paid employment in the UK and travel.

- When asked to indicate their main reason for taking a gap year, the most frequent response was to have a break from studying, closely followed by wanting to travel.

8.2.3 No immediate plans for HE

Just over 400 respondents had no immediate plans to enter higher education. Of these 190 were in some form of employment and 108 were in full or part-time education.

- Asked how likely it was that they would apply for a place at university in the future (on a four point scale from *definitely will* to *probably not*) 204 indicated that they *definitely will* and a further 77 that they *probably will.*

- The remaining respondents (approximately 100) were asked to indicate their reasons for not going to university from a list of options and to rate the importance of each reason in their decision. The reasons rated as being very important or somewhat important by a majority were (in order of frequency): worried about getting into debt; not wishing to study further; not being able to afford to go; not needing a degree for their job; and happy in the job they are doing.

In subsequent phases of the research, it is hoped to relate the information collected from these surveys to the university destinations and degree outcomes of students in the main sample.

9 Future phases of the research

As mentioned at various points in this report there are still further analyses to be carried out with the current data, namely:

- further exploration of the relationships between SAT® scores and attainment in particular subjects, or groups of subjects, at GCSE and A level
- more complex modelling of the background data of students in the sample to create more sensitive measures of economic and educational disadvantage (in order to better answer the question as to whether the SAT® can identify students with the potential to benefit from HE whose ability is not adequately reflected in their A levels because of their disadvantaged circumstances).

The results of these further analyses will be presented in a second published report in 2008. This report will also examine the destinations of students in the sample, relating such information (where possible) to previously-collected data on both background and attainment. HESA information on the university destinations of students in the main sample will be provided by HEFCE and some analysis of this will be carried out, to see if there are factors other than A level attainment which seem to impinge on the chances of acceptance into particular kinds of institution. This report will be published in May 2008, provided the destination data is available by January 2008 as scheduled.

The final report in 2010 will follow the collection of degree outcomes from HEFCE. It will attempt to relate these to the SAT® scores and the A-level outcomes, adjusting as far as possible for the loss of those not selected for university places. A multilevel model will be set up to examine whether the initial aptitude test results gave significantly improved predictions of degree outcomes. The analyses will explore the effects of different types of school and university. Separate analyses for some popular subjects might be possible, as well as analyses within universities. (Such analyses will of course be reported in anonymised form.) This report could be completed by April 2010, depending on the availability of the degree outcomes data. Further analyses could include those students graduating after 2009 subject to an extension to the existing contract.

Once completed, this research will enable some important conclusions to be made about the use of the SAT® or similar aptitude test in university admissions. Each of the research questions listed in section 2.2 requires a study of the relationships between A levels (and GCSEs) and university degree results, on the one hand, and the SAT® and university degree results, on the other. The success of the SAT® in fulfilling the specified purpose will be demonstrated if it can be shown that the combination of the SAT® and A levels provides a better prediction of degree success than A levels alone. In addressing the question about students in disadvantaged circumstances, such a pattern of correlations will provide validation evidence for the SAT® in identifying those with potential – attested by their eventual degree results – not recognised by A levels. In addressing the question regarding the most able HE

candidates, the SAT® will be valid for this purpose if it provides additional discrimination amongst the highest attaining students that overcomes the ceiling effect of A levels.

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Appendix 1: Spring 2006 Student Questionnaire

The data provided is based on the responses of up to 6825 students who took part in the spring 2006 student survey. Unless otherwise stated, the figures represent the percentage responses for each question or item. Figures may not sum to 100 either due to rounding to the nearest integer or because more than one answer could be given.

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uniQue

your individual experience of higher education

The NFER is currently conducting research on the use of an aptitude test in university entrance. You may remember taking the SAT test earlier this academic year. At the beginning of the summer term you will receive your results, an explanation of what these mean and a certificate to add to your personal portfolio. As part of this on-going research, we would like to find out about students' opinions of school / college and higher education. We would therefore be very grateful if you would complete this questionnaire. For most questions, please just ✓ the box which is closest to what you think. All your answers will be treated in complete confidence.

The questionnaire should take about 20 minutes to complete. When you have finished, please put it into the envelope provided and return it to your teacher / administrator.

Thank you for your help.

Please check the following information (as supplied on your agreement form) and amend as necessary. These details will be used to contact you in the future about your progress but will not be passed on to anyone unconnected with this research.

First name:

Last name:

Gender: Date of birth (dd/mm/yy):

Home address:

Town: County:

Postcode:

e-mail:

Mobile phone number:

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Please note:
You can study for higher education qualifications, such as degrees and higher education diplomas, in many different places, for example universities, other higher education institutions (HEI's) and some further education colleges. For simplicity, in this questionnaire we refer only to **universities** and **degrees**. However, **university** includes the range of different places offering these courses and **degree** means any higher education qualification.

What next?

1 What are you intending to do in the 12 months following your A level results?
*(Please ✓ **all** that apply.)*

Complete a Foundation Course / Access Course	4 1
Study for a degree at a university	74 2
Take a year out (gap year)	17 3
Do more A levels	2 4
Do a vocational course (e.g. BTEC National Certificate)	1 5
Go into any kind of paid work	16 6
Go into paid work with good career prospects	7 7
Do a Modern Apprenticeship / Advanced Apprenticeship	2 8
Do voluntary work	7 9
Look after the home / family	1 10
Don't know	3 11
Something else *(please say what)*	2 12

e.g. travel

2a Do you have a specific job or career you would like to do in the future?
*(Please ✓ **one box** only.)*

Yes, absolutely certain	Yes, fairly certain	Unsure	No, no idea at all
21 1	40 2	30 3	9 4

2b What job or career is that?

Most frequent responses: medicine; engineering; health and social welfare

We are interested in your views of university, whether or not you plan to go. Please answer the following questions.

3 Please tell us if you agree or disagree with the following statements.
*(Please ✓ **one box** in each row.)*

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
	1	2	3	4	5
I think I would enjoy studying for a degree	42	48	8	2	1
I think my exam results will be good enough to get me into university	23	52	23	2	1
I think I would find it easy to fit in at a university	22	57	19	2	–
The work at university would be too hard for me	1	4	41	47	7
Most of my friends are going to university	43	46	6	5	1
I would want to live at home if I went to university	6	7	13	28	46
My parents / carers would be very pleased if I went to university	58	35	6	1	–
My friends would think I was a snob if I went to university	–	1	3	25	70
I think my parents / carers would put me under too much pressure to do well at university	2	10	22	43	23
The new system of financial support for students makes it more likely that I shall go to university	5	18	37	27	13
The introduction of higher fees makes it less likely that I shall go to university	6	15	27	40	12
I don't think I can afford to go to university	3	10	24	44	19

4 Please tell us if you agree or disagree with the following comments.
*(Please ✓ **one box** in each row.)*

	Strongly agree 1	Agree 2	Not sure 3	Disagree 4	Strongly disagree 5
Life at university is just like school / college	1	6	28	53	12
Most people who go to university end up in debt	21	51	18	9	2
People who go to university have to be very clever	1	15	21	56	7
Students at university never do any real work	1	3	11	63	23
People with degrees get better paid jobs	22	55	15	8	1
The only way most people can afford to live at university is to have a part-time job	7	40	28	23	2
The cost of university will be worth it in the long run	34	48	15	2	–
I think you can be successful without a degree	18	57	19	5	1
Studying at university will be more interesting than school / college	32	50	17	1	–

5 For which of the following reasons might you go to university?
*(Please ✓ **all** that apply.)*

The subject / course sounds interesting	86 1
A degree is essential for the career / career path I have chosen	63 2
Graduates earn more money	58 3
A degree will help me get a more interesting job	65 4
I am attracted by the social life	65 5
I am being encouraged to go by people who are close to me	40 6
I want to get away from home	36 7
It will give me time to think about what I want to do next	38 8
Other *(please say what)*	3 9

e.g. personal development

6a Do you think you will go to university in either 2006 or 2007? *(Please ✓ **one box** only.)*

Definitely	Probably	Probably not	Definitely not
68 1	24 2	5 3	3 4

If you do not intend to go to university in 2006 or 2007, please go to Question 7a.

6b If you have already applied to university, please tell us your UCAS number, **if known**.

6c If you have chosen the subject you wish to study, what reasons influenced your choice? *(Please ✓ **all** that apply.)*

It is the subject that I am best at in school	40 1	I find the subject easy	14 5
It is the subject that I enjoy most at school	61 2	It is easy to get on a course	3 6
The subject is essential for my intended future career	52 3	Advice from teachers	14 7
		Advice from parents	14 8
Other *(please say what)*	5 4		

e.g. interest in subject

6d At this stage, which university or other institution would be your preferred choice for higher education?

6e Why is this institution your preferred choice? *(Please ✓ **all** that apply.)*

It has a good academic reputation	74 1
The course is the best available in my chosen subject	48 2
I want to stay close to home	21 3
I like the city / town where it is located	67 4
It has good facilities	73 5
It offers a good social life	62 6
To be with my friends / partner	9 7
Graduates from there have good employment prospects	49 8
It is easy to get into	7 9
Other people in my family have been there	9 10
Other *(please say what)*	4 11

e.g. specific comment about course

Now go to Question 8a.

7a If you are **not** intending to go to university in 2006 or 2007, would you consider university in the future? *(Please ✓ **one box** only.)*

Yes	No	Don't know
39	**17**	**43**

7b If you do **not** intend to go to university, please indicate which of the following reasons have influenced your decision. *(Please ✓ **all** that apply.)*

I am worried about debt / finance	**38** 1
I have been unable to obtain an offer of a place so far	**4** 2
I wish to pursue a job / career that does not require a degree	**38** 3
I think work at university would be too difficult	**16** 4
My parents / family do not wish me to go	**3** 5
I do not wish to move away from family / friends	**11** 6
My grades / qualifications will not be good enough	**19** 7
I have a firm offer of a job / employment	**7** 8
I have no desire to study further	**32** 9
I have had insufficient information about how to apply	**4** 10
I have had insufficient information about what courses are available	**6** 11
I have had insufficient information about what help I could get to pay for university	**8** 12
It can be difficult to know what it will be like beforehand	**16** 13
Other *(please say what)*	**6** 14

e.g. undecided

Views on school / college

8a We would like to know how you feel about your studies and school / college at the moment. For each statement please tick the box that most closely fits with how you feel. *(Please ✓ **one box** on each row.)*

	Strongly agree 1	Agree 2	Not sure 3	Disagree 4	Strongly disagree 5
The work I am doing at school / college is interesting	11	68	12	8	1
My studies at school / college will help me in the future	30	61	7	2	–
I was given good advice when choosing my A levels	9	42	25	20	4
Teaching standards at this school / college are poor	1	6	14	53	26
Most teachers in my school / college treat the students with respect	18	64	12	5	1
I think that this school / college is a good place to study	24	57	13	5	1
Students' views / opinions are listened to at this school / college	8	42	31	15	4
Most teachers at this school / college encourage pupils who are good at something	19	64	13	4	–
Most of the time I like being at school / college	14	57	17	10	3
My school / college should concentrate more on preparation for tests and exams	6	22	35	33	4
Most teachers at this school / college help students who have difficulty with their work	16	61	17	5	1
I usually work hard at school / college	18	60	15	6	1
I regret staying on at school / college after Year 11	1	3	7	30	58
Discipline or control problems with other students have interfered with my ability to learn at this school / college	3	9	16	42	30

8b If you were making the decision about whether or not to stay on at school or college after Y11 again, would you do the same thing over again? *(Please ✓ **one box** only.)*

Definitely	Probably	Don't know	Probably not	Definitely not
63 1	22 2	7 3	5 4	2 5

9a We would like to know what help you think your school / college has given you in preparing for your future. *(Please ✓ **one box** on each row.)*

How well do you think your education in Years 12 and 13 has:	Very well	Quite well	Not very well	Not at all well
	1	2	3	4
equipped you with useful skills and knowledge?	28	66	6	1
encouraged you to look into vocational qualifications?	10	37	42	12
enabled you to perform to the best of your ability?	29	59	11	1
given you helpful information about university?	32	50	16	2
prepared you for studying at university?	18	54	24	4
given you helpful information about jobs and training?	8	38	42	11

9b How many of the students in the same year at your school / college would you say are planning to go to university? *(Please ✓ **one box** only.)*

Almost all of them	Most of them	About half of them	A few of them	Hardly any of them
40 [1]	48 [2]	11 [3]	2 [4]	– [5]

10 Have you done any of the following things in Year 12 or Year 13? *(Please ✓ **all** that apply.)*

I attended an open day at a university	83 [1]
I took part in a residential course at a university during term time	11 [2]
I took part in a summer / winter / Easter school	7 [3]
I went to an Aimhigher Roadshow	17 [4]
I had information about higher education from a representative of a university who visited my school / college	55 [5]
I attended a university for an interview	43 [6]
I have looked at a university website / prospectus / CD	93 [7]

11 How would you rate the careers education and guidance given to you by your school / college to help you make the right choices for the future? *(Please ✓ **one box** only.)*

Helpful	Not sure	Not helpful	Haven't had any
44 [1]	35 [2]	16 [3]	5 [4]

You and your home

12a At home do you usually use a language other than English?

Yes **16** No **84**

12b If **yes**, what language is that?

most frequent responses: Chinese; Gujarati; Punjabi; Urdu

13a Have you always lived in the UK?

Yes **87** No **13**

13b If **no**, how many years have you lived in the UK?

mean = 9

14 Do you live in a rented property or is it owned by someone you live with? *(Please ✓ **one box** only.)*

Owned by parents or someone you live with	**88** 1	Prefer not to say	**4** 3
Rented	**6** 2	Don't know	**2** 4

15 Who do you live with most of the time? *(Please ✓ **all** that apply.)*

Father	**76** 1	Step-father (or mother's partner)	**5** 3
Mother	**93** 2	Step-mother (or father's partner)	**1** 4
		Other adult (e.g. grandmother, cousin) *(please say who)*	**4** 5

e.g. grandparent

16 How many brothers / sisters (including step brothers / sisters) have lived at home with you at some point in the last 5 years (not including yourself)?

mean = 2

17a Could you tell us about the education of your mother and father or those person(s) who are like a mother or father to you — for example, guardians, step parents, foster parents, etc. *(Please ✓ **all** that are true.)*

Did your mother and father:	Mother / guardian	Father / guardian
finish secondary school (at 15 / 16)?	59 1	57 1
study at college or school sixth form (after age 16)?	49 2	45 2
study at university or polytechnic / get a degree?	35 3	41 3
Don't know	8 4	8 4

17b Do you have a brother or sister who has studied or is studying at university?

Yes 37 No 63

18 How much financial support would you receive from your relatives / guardians if you went to university? *(Please ✓ **one box** only.)*

Full support, they do not want me to take out a loan	12 1	No support	7 4
Significant support to supplement a loan	45 2	I don't know	24 5
Minimal, irregular support	13 3		

Questions 19a-19d ask about the parents or step-parents **who you live with now**. (If you don't live with any parents or step-parents **now** answer about the parents or step-parents you lived with when you were 15 and what they were doing **then**.)

19a Are your parents (or step-parents) employed at the moment?

Father (or step-father)	Yes 92	No 8
Mother (or step-mother)	Yes 80	No 20

19b Please give the occupation of your parent or step-parent who earns the most (e.g. primary school teacher, plumber). If he or she is retired or unemployed, give their most recent occupation.

19c Please describe the type of work he / she does (e.g. installs central heating systems).

19d Does he / she have formal responsibility for supervising the work of other employees?

Yes	No	Not sure
61	16	23

20 Approximately how often do you do the following in your spare time?
*(Please ✓ **one box** in each row.)*

	4+ times per week 1	2-3 times per week 2	Once a week 3	Occasionally 4	Never 5
Reading not related to course work	24	24	15	30	7
Team sport (e.g. football, hockey)	9	16	14	29	32
Individual sport / fitness (e.g. tennis, yoga)	13	26	22	27	12
Music (e.g. playing an instrument individually or in a band / orchestra)	14	11	8	15	52
Other hobbies / out of school clubs	9	22	23	27	18
Part-time job	7	31	20	11	31
Charity or voluntary work	1	4	13	33	50
Look after relatives or dependants	3	4	6	30	58

21 About how many books are there in your home? Do not count newspapers, magazines or school books. *(Please ✓ **one box** only.)*

None (0 books)	1 1
Very few (1–10 books)	3 2
Enough to fill one shelf (11–50 books)	12 3
Enough to fill one bookcase (51–100 books)	16 4
Enough to fill two bookcases (101–200 books)	21 5
Enough to fill three or more bookcases (more than 200 books)	47 6

22a Which of the following do you usually prefer when studying? *(Please ✓ **one box** on each row.)*

i	tests	43	**or**	coursework	57
ii	team work	46	**or**	individual work	54
iii	independent learning	38	**or**	directed learning	62

22b Do you set yourself goals when studying and stick to them? *(Please ✓ **one box** only.)*

frequently	sometimes	rarely	never
22 1	57 2	17 3	4 4

22c Do you read around subjects (i.e. more than is required to fulfil your coursework)?
*(Please ✓ **one box** only.)*

frequently	sometimes	rarely	never
16 1	**60** 2	**21** 3	**3** 4

22d To what extent do each of the following motivate you to study?
*(Please ✓ **one box** in each row.)*

	a lot 1	a little 2	not at all 3
My parents expect me to do well	**50**	**44**	**7**
My school / college expects me to do well	**36**	**52**	**12**
I need specific results for what I want to do	**73**	**22**	**5**
I want to do well	**89**	**10**	**1**
I enjoy studying	**29**	**53**	**18**
Other *(please say what)*	**43**	**22**	**36**

e.g. job prospects

23a Do you feel that your AS results reflect your true ability?

Yes	No	Not sure
34	**51**	**15**

23b If **no**, which of the following reasons best describe why: *(Please ✓ **all** that apply.)*

I didn't do enough work	**69** 1	I didn't enjoy the work	**24** 5
I was very lucky	**3** 2	Personal circumstances	**25** 6
The teaching has been poor	**19** 3		
Other *(please say what)*	**13** 4		

e.g. perform poorly on tests

24 Earlier this academic year, you took the SAT test. Do you think the SAT is likely to better reflect your true ability than your AS results? *(Please ✓ **one box** only.)*

Definitely	Probably	Don't know	Probably not	Definitely not
1 [1]	8 [2]	34 [3]	29 [4]	28 [5]

25 Do you have any comments you wish to make about your experience of taking the SAT test?

Most frequent responses:

- **repetitive / boring / too long**
- **not relevant to current / future studies**
- **does not reflect ability**
- **limited range of subjects**

26 Do you have any comments you wish to make about university?
We are interested in your views whether or not you intend to go.

Most frequent responses:

- **general positive comment**
- **comment re future benefits**
- **comment re debt / finance**
- **comment re personal development**

Thank you very much for your help

Please put your questionnaire in the envelope provided and return to your administrator.

Appendix 2: Autumn 2006 Student Questionnaire

The data provided is based on the responses of up to 3177 students who took part in the autumn 2006 student survey. Unless otherwise stated, the figures represent the percentage responses for each question or item. Figures may not sum to 100 either due to rounding to the nearest integer or because more than one answer could be given.

nfer

unique

your individual experience of higher education

AUTUMN 2006

As part of the ongoing UNIQUE research project we would like to find out about your plans for higher education or employment, now you have received your A level results. It is very important to our research to compare the different experiences of school / college leavers, whether or not they intend to enter higher education.

As a thank-you for your involvement in this research we would like to offer you a chance to win £1000 in our free-to-enter prize draw. Five entrants will each win the sum of £1000 – a total prize fund of £5000.

Full details and the rules governing the prize draw are given on a separate sheet enclosed with this questionnaire.

We should be grateful if you would now complete this short questionnaire – it should take no longer than 10 minutes of your time. Please note that any information provided by you may be used by the NFER and the partners involved in the study for the purposes of this research. All your answers will be treated in complete confidence – any report arising from the study will not refer to any individuals but will describe the data collected in an aggregated format only.

Please place your completed questionnaire in the return envelope provided and post it back to us no later than 29 September 2006.

Thank you for your help.

If you have any questions about this research, please contact:

David Hereward
Research Data Services
NFER
The Mere
Upton Park
Slough SL1 2DQ
Tel: 01753 637352
email: d.hereward@nfer.ac.uk

Please note:
You can study for higher education qualifications, such as degrees and higher education diplomas, in many different places, for example universities, other higher education institutions (HEIs) and some further education colleges. For simplicity, in this questionnaire we refer only to **universities** and **degrees**. However, **university** includes the range of different places offering these courses and **degree** means any higher education qualification.

We are interested in the A level grades you have achieved and how these compare with any predictions made by your school or college.

1 For your three best subjects, please circle the grades you were **predicted** to achieve by your school/college at the time of your UCAS application (if known) and your **actual** A level grades. *(If the prediction made was at the borderline of two grades, e.g. A/B or B/C please circle both grades. Please list **full** GCE A levels or Advanced VCEs only.)*

	*Circle **predicted** grade/s (e.g. A or A/B)*	*Circle **actual** grade achieved*
Subect 1	A B C D E Don't know	A B C D E U
Subject 2	A B C D E Don't know	A B C D E U
Subject 3	A B C D E Don't know	A B C D E U

2 Will you be starting at a university in September / October this year (2006)?

Yes 77 ***go to Q3 (n = 2455)*** No 23 ***go to Q11 (n = 713)***

If you are still unsure whether or not you have a place for this year, please wait until you are able to answer Question 2 before completing the questionnaire.

3 If you have a place at university this year (Sept / Oct 2006), was this university your: *(Please ✓ **one** box.)*

Firm (first) choice? 86
Insurance (second) choice? 6
} ***go to Q6*** **(n = 2269)**

Place obtained through clearing? 8 ***go to Q4*** **(n = 184)**

4 If you used the clearing system, how many universities did you contact (including your final choice) in order to secure a place? *(Please ✓ **one** box.)*

One [48] Two [20] Three [11] Four + [20] Don't know [1]

5 If your university place was obtained late or through the clearing system:

a) Did your results on the SAT® test that you took in year 13 as part of this research project encourage you to apply to university?

Yes [6] No, would have gone anyway [94]

b) Did you inform prospective universities of your SAT® scores?

Yes [1] No [99]

c) If **yes**, were your SAT® scores helpful in securing your place?

Yes [–] No [–] Don't know [–]

6 What is the duration of the course you are starting in Sept / Oct 2006? *(Please ✓ **one** box.)*

1 year [2] 2 years [1] 3 years [61] 4 years [29] More than 4 years [7]

7 How far is your university from your home? *(Please ✓ **one** box.)*

Less than 10 miles [10] 10–49 miles [22] 50–100 miles [30] More than 100 miles [38]

8 Where do you plan to live during the academic year 2006/7? *(Please ✓ **one** box.)*

A hall of residence or other university accommodation (e.g. flat or house) [82]$_1$

A rented flat or house (not owned by university) [3]$_2$

A property owned by you or your family (but not family home) [–]$_3$

With parent(s) or another family member (e.g. sister, brother, grandparent) [14]$_4$

9 At this stage, how confident are you in your academic ability to complete the course you have chosen?
*(Please ✓ **one** box.)*

Very confident	39 [1]	Not very confident	4 [3]
Fairly confident	57 [2]	Not at all confident	– [4]

10 How much of your **first year's** total expenses (including course fees, accommodation, food, other living expenses, etc) do you expect to cover from each of the following sources?
*(Please ✓ **one** box in **each row**.)*

	None	Less than £2000	£2000 – £4000	£4001 – £6000	£6001+
Money from parents / family / relatives / spouse	1 16	2 44	3 26	4 8	5 7
Money from own resources (savings, past earnings, etc)	23	68	8	1	–
Money from (part-time) employment during the year	26	64	9	–	–
Money from an employer to pay for you to go to university	99	1	–	–	–
Money that does **not** have to be repaid, e.g. grants, bursaries (other than from an employer)	54	23	20	2	1
Money that has to be repaid (e.g. student loans, bank loans, overdrafts, loans from family, friends, etc)	9	5	38	24	24

Now go to Q22 on page 10.

This section of the questionnaire is for anyone <u>not</u> starting a university course this year (September / October 2006).

11 Do you have a guaranteed / deferred place at university starting in Sept / October **2007**?

Yes [40] ***go to Q12*** **(n = 285)** No [60] ***go to Q14*** **(n = 427)**

12 Listed below are various things people do in 'gap years'. For each of these, please tell us if you think you will do this activity during the next 12 months?
(Please ✓ ***one*** *box in* ***each row****.)*

	Yes	No	Don't know
Re-sit AS / A2 modules	[10]	[82]	[8]
Do a foundation / access course at FE college	[7]	[88]	[6]
Do charity / volunteer / unpaid work in UK	[26]	[52]	[22]
Do charity / volunteer / unpaid work abroad	[36]	[44]	[20]
Do paid work in UK	[93]	[5]	[3]
Do paid work abroad	[30]	[47]	[24]
Travel (for pleasure – not work / project related)	[72]	[15]	[13]

13 What is your **main** reason for taking a gap year? *(Please ✓* ***one*** *box.)*

I want time to decide what I want to do next.	[13] 1
So that I can earn some money to help finance my time at university.	[17] 2
I want a break from studying.	[29] 3
I want to travel.	[27] 4
I want to do voluntary work (oversees or UK).	[3] 5
I want to gain work experience (voluntary or paid).	[13] 6

Now go to Q22 on page 10.

This section of the questionnaire is for anyone <u>not</u> considering higher education in 2006 or 2007.

14 Please indicate what you are doing at the moment – your **main** activity? *(Please ✓ **one** box.)*

Apprenticeship (or other government funded training)	4 1	***go to Q16*** **(n = 298)**
In a full-time job (30 hours or more per week)	25 2	
In a part-time job - less than 30 hrs per week (if this is your **main** activity)	20 3	
Self-employed	1 4	
In full-time education at school / college	21 5	
Enrolled on a part-time education or training course, (excluding leisure courses) as your **main** activity	7 6	
Looking for work / unemployed	15 7	***go to Q15*** **(n = 84)**
Taking a break from study or work	7 8	
Looking after a home or family	– 9	

15 There may be specific reasons why you are not currently in employment, education or training. Please indicate whether or not the following reasons apply to you.
*(Please ✓ **one** box in **each row**.)*

	Yes	No
I need more qualifications to get a job or place in education / training.	16	84
I am looking after the home / children or other family members.	9	91
I have a disability or poor health.	1	99
There are no decent jobs where I live.	23	77
I have not yet decided what job or course I want to do.	50	50
I have not yet found a suitable job or course.	76	24
I have housing problems.	–	100
I would be worse off financially in work or on a course.	3	97
Travelling to work or college would be difficult because of poor transport where I live.	3	97

16 How likely is it that you will apply for a place at university at some time in the future?

Definitely will	52	***go to Q18*** **(n = 281)**
Probably will	20	
Probably won't	22	***go to Q17*** **(n = 110)**
Definitely won't	6	

17 Listed below are a number of reasons that some people give for not going to university. Please tell us how important each of these reasons was in your decision?
*(Please ✓ **one** box in **each row**.)*

	Very important	Somewhat important	Not important
My A level grades are not good enough.	11	27	62
I do not want to study any more.	33	37	30
I cannot afford to go.	30	39	31
I do not have the confidence to go to university.	8	23	69
I do not need a degree for the job I wish to do.	38	27	35
I applied but was unable to obtain a place.	2	3	95
I think the work would be too difficult.	6	19	75
I am worried about getting into debt.	38	35	27
I do not wish to move away from my family or friends.	9	35	56
It's difficult to know what it will be like.	7	30	63
I don't know how to apply.	2	7	91
I'm happy in the job that I am doing.	30	28	43

18 Did your results on the SAT® test that you took in year 13 as part of this research project:
*(Please ✓ **one** box.)*

Encourage you to think about applying to university?	7
Discourage you from applying to university?	1
Make no difference to your plans for the future?	92

19 Are you currently on an apprenticeship scheme, in full-time paid employment (30 hours or more per week) or waiting to take up a job / apprenticeship?

Yes **37** ***go to Q20*** **(n = 146)** No **37** ***go to Q22*** **(n = 246)**

20 In which of the following occupations or areas of work are you currently employed, on an apprenticeship scheme or waiting to take up work? *(Please ✓* ***one*** *box.)*

Management (or trainee management) **19** 1
(eg industrial / office / retail / farm / hospitality / leisure management)

Technical support posts **6** 2
(eg laboratory / electronics / science / engineering / IT technician)

Health and social welfare **9** 3
(eg nurse, paramedic, dispensing optician, therapist)

Protective service occupations **3** 4
(eg armed services, police, fire service, prison service)

Culture, media and sports **6** 5
(eg actor, musician, journalist, photographer, fitness instructor)

Business / public service occupations **11** 6
(eg insurance broker, buyer, sales representative, estate agent, careers adviser)

Administrative and secretarial **21** 7
(eg, secretary, accounts clerk, (hotel) receptionsist, VDU operator, civil service EO)

Skilled trades **6** 8
(eg electricians, mechanics, engineers, plumbers, printers)

Construction trades **2** 9
(eg carpenters, bricklayers, glaziers, plasterers, decorators)

Service occupations **15** 10
(eg dental nurse, care assistant, hairdresser, sales assistant, call centre operator)

Machine operators / transport **1** 11
(eg bakery assistant, assembler, tyre fitter, machinist, drive)

21 What is your current gross annual salary before tax, NI or any other deductions?
(This question will allow us to monitor the starting salaries of non-graduates and compare these with the starting salaries of graduates in 2009.)
*(Please ✓ **one** box.)*

Less than £10,000 a year	48 1
Between £10,000 and £12,999 a year	30 2
Between £13,000 and £16,999 a year	17 3
Between £17,000 and £20,999 a year	4 4
Between £21,000 and £25,000 a year	1 5
More than £25,000 a year	– 6

This section is for everyone.

22 We would like to contact you again during the next three years to find out about your experience of life after school / college. On each occasion we would like to offer a small token of our appreciation for your participation in this research.

Please indicate which of these options would most encourage you to complete one of our surveys:
*(Please ✓ **one** box.)*

Free gift (e.g. mouse-mat, mug, pen, etc) sent with questionnaire	6 1
Music / book token – value £5 sent with questionnaire	44 2
Prize draw (5 prizes of £1000)	25 3
Prize draw (50 prizes of £100)	25 4

If you would like your name to be entered into the 2006 prize draw, please tick this box.	97
If you are one of the five winners and you would be willing to be interviewed for a news feature on our website, please tick this box.	56

Thank you very much for your help

Please put your questionnaire in the envelope provided and post it back to us as soon as possible.

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Appendix 3: SAT® Descriptive Statistics

The analyses are based on up to 9022 students who took the SAT® test in autumn 2005.

Table A3.1: SAT Reasoning Test™ scores by gender

	N	Critical Reading	Mathematics	Writing
Male	4167	***485.7***	***516.3***	***485.2***
Female	4854	***493.1***	***478.5***	***506.5***
Total	9021			

Values significantly different at (at least) the 5 per cent level are shown bold and in italics.

Figure A3.1: Critical reading score distributions by gender

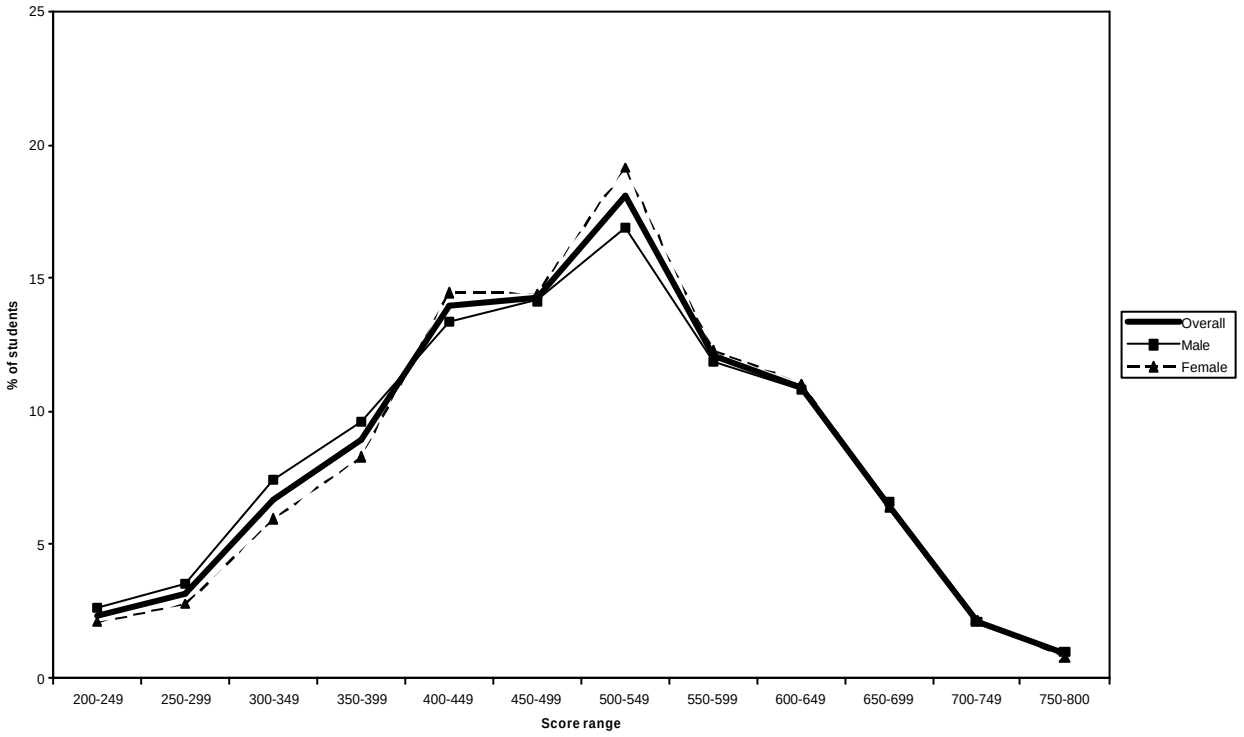


Figure A3.2: Mathematics score distributions by gender

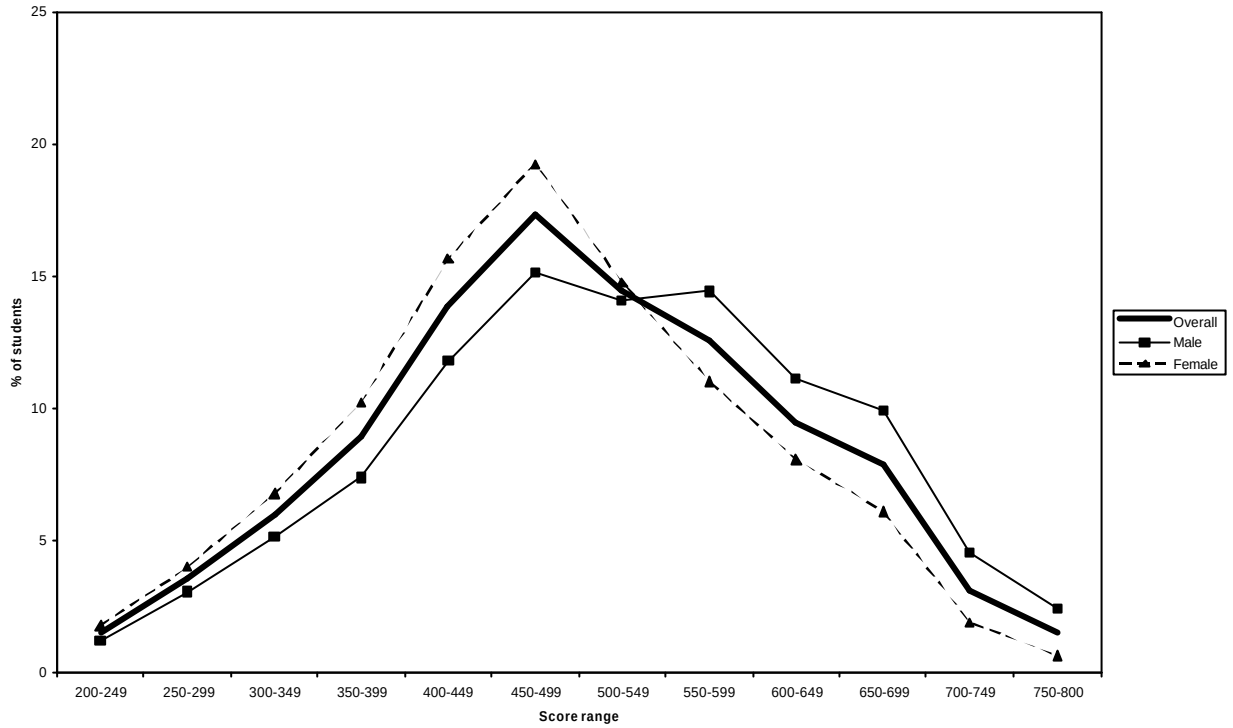


Figure A3.3: Writing score distributions by gender

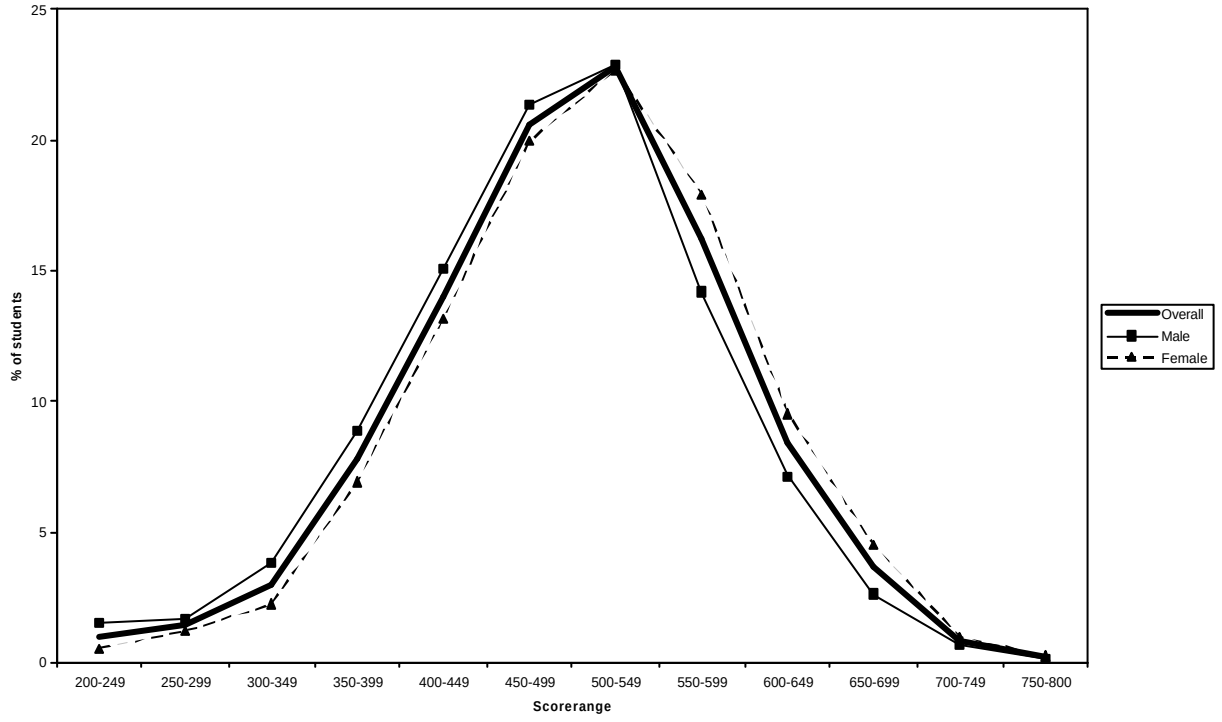


Table A3.2: SAT® Critical Reading – total score distribution by gender

Score Range	Overall %	Male %	Female %
200-224	2.02	2.21	1.85
225-249	0.33	0.41	0.27
250-274	1.87	2.23	1.57
275-299	1.26	1.32	1.22
300-324	3.33	3.48	3.17
325-349	3.34	3.96	2.80
350-374	5.84	6.38	5.38
375-399	3.07	3.24	2.93
400-424	9.07	9.05	9.09
425-449	4.88	4.30	5.38
450-474	8.97	9.24	8.74
475-499	5.33	4.92	5.69
500-524	10.74	9.82	11.54
525-549	7.34	7.06	7.58
550-574	7.40	7.20	7.58
575-599	4.70	4.68	4.72
600-624	7.93	8.11	7.77
625-649	3.01	2.69	3.30
650-674	4.66	4.58	4.72
675-699	1.87	2.04	1.73
700-724	1.53	1.37	1.67
725-749	0.63	0.72	0.56
750-774	0.64	0.77	0.54
775-800	0.24	0.24	0.25

n = 9022
mean score = 489.63
standard deviation =118.05

Table A3.3: SAT® Mathematics – total score distribution by gender

Score Range	Overall %	Male %	Female %
200-224	1.06	0.86	1.24
225-249	0.42	0.31	0.52
250-274	1.31	1.06	1.50
275-299	2.25	1.99	2.47
300-324	3.01	2.57	3.40
325-349	2.98	2.54	3.36
350-374	4.02	3.05	4.86
375-399	4.88	4.32	5.36
400-424	7.79	6.50	8.90
425-449	6.06	5.26	6.76
450-474	11.46	9.91	12.79
475-499	5.89	5.21	6.47
500-524	9.64	9.14	10.07
525-549	4.80	4.94	4.68
550-574	8.41	9.55	7.44
575-599	4.17	4.87	3.56
600-624	6.52	7.54	5.64
625-649	2.95	3.58	2.41
650-674	5.32	6.60	4.22
675-699	2.52	3.29	1.85
700-724	2.67	3.89	1.63
725-749	0.41	0.60	0.25
750-774	0.75	1.25	0.33
775-800	0.70	1.18	0.29

n = 9022
mean score = 495.93
standard deviation = 118.68

Table A3.4: SAT® Writing – total score distribution by gender

Score Range	Overall %	Male %	Female %
200-224	0.67	1.01	0.37
225-249	0.35	0.53	0.19
250-274	0.65	0.62	0.68
275-299	0.78	1.06	0.54
300-324	1.36	1.70	1.07
325-349	1.61	2.11	1.17
350-374	3.45	4.06	2.93
375-399	4.37	4.80	4.00
400-424	7.57	8.40	6.86
425-449	6.47	6.70	6.28
450-474	12.66	12.98	12.38
475-499	7.94	8.38	7.56
500-524	13.47	13.89	13.10
525-549	9.30	8.98	9.58
550-574	9.21	8.69	9.66
575-599	6.99	5.50	8.28
600-624	5.60	4.61	6.45
625-649	2.84	2.54	3.09
650-674	2.80	2.18	3.34
675-699	0.85	0.46	1.19
700-724	0.61	0.55	0.66
725-749	0.24	0.12	0.35
750-774	0.11	0.10	0.12
775-800	0.10	0.05	0.14

n = 9022
mean score =496.61
standard deviation =92.27

Table A3.5: SAT Reasoning Test™ scores by type of institution

	N	Critical Reading	Mathematics	Writing
Comprehensive	4784	***462.8***	***462.2***	***474.4***
Grammar	1734	***540.6***	***550.1***	***536.8***
Independent	2082	***514.8***	***533.0***	***519.8***
FE College	422	***460.0***	***473.2***	***468.2***

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Figure A3.4: Critical reading score distributions by type of institution

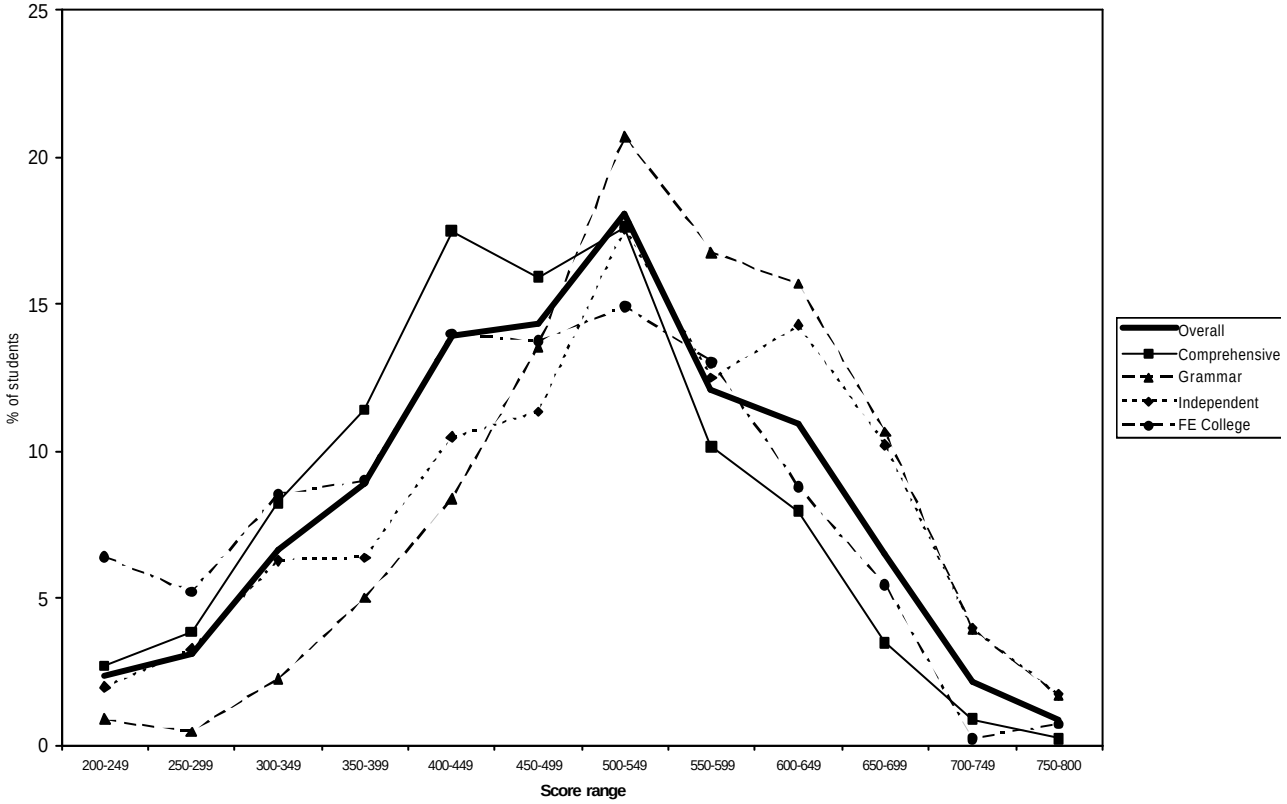


Figure A3.5: Mathematics score distributions by type of institution

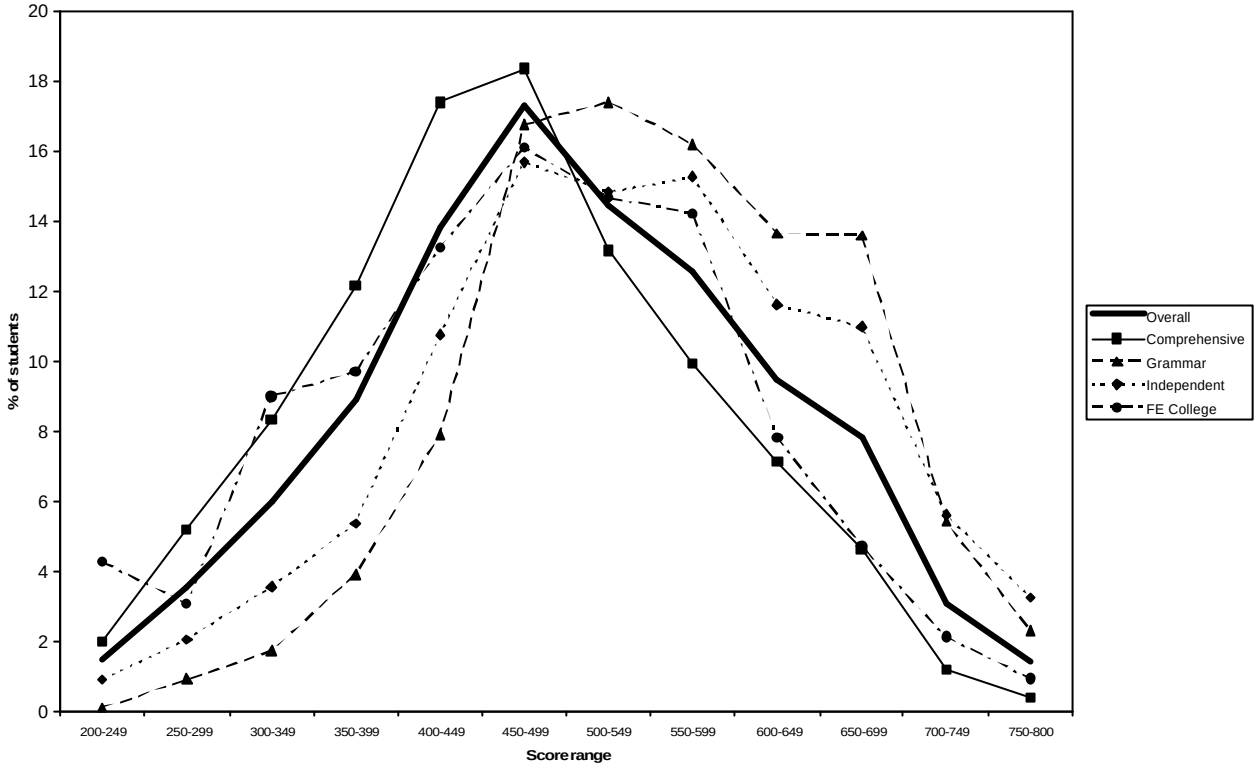


Figure A3.6: Writing score distributions by type of institution

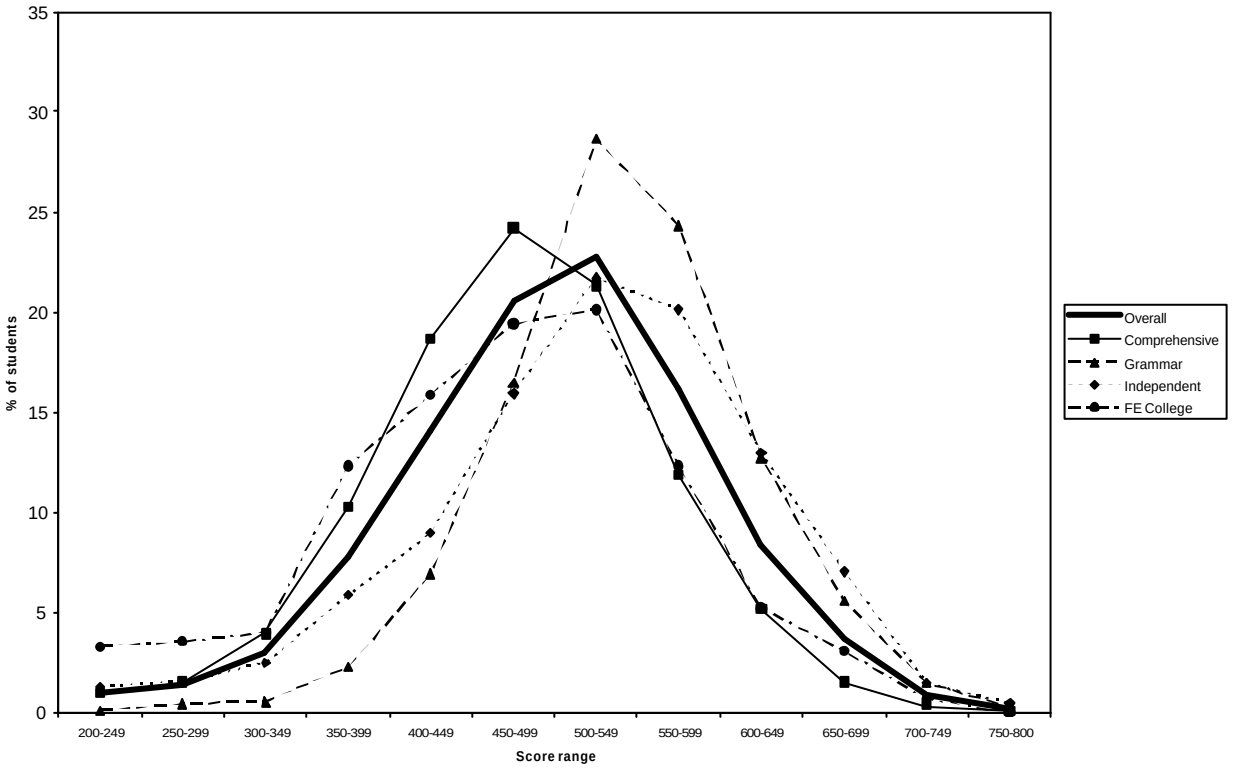


Table A3.6: SAT® Critical Reading – total score distribution by type of institution

Score Range	Overall %	Comprehensive %	Grammar %	Independent %	FE College %
200-224	2.02	2.30	0.69	1.63	6.16
225-249	0.33	0.40	0.17	0.34	0.24
250-274	1.87	2.45	0.23	1.68	3.08
275-299	1.26	1.42	0.23	1.59	2.13
300-324	3.33	4.10	1.10	3.22	4.27
325-349	3.34	4.16	1.15	3.07	4.27
350-374	5.84	7.27	3.34	4.42	6.87
375-399	3.07	4.14	1.67	1.97	2.13
400-424	9.07	11.60	4.73	6.92	8.77
425-449	4.88	5.87	3.63	3.55	5.21
450-474	8.97	10.16	7.79	7.25	8.77
475-499	5.33	5.75	5.77	4.08	4.98
500-524	10.74	10.91	11.19	10.47	8.29
525-549	7.34	6.71	9.52	7.11	6.64
550-574	7.40	6.48	10.15	7.40	6.64
575-599	4.70	3.68	6.63	5.09	6.40
600-624	7.93	5.92	11.65	9.89	5.69
625-649	3.01	2.05	4.04	4.37	3.08
650-674	4.66	2.59	7.09	7.35	4.74
675-699	1.87	0.92	3.58	2.88	0.71
700-724	1.53	0.63	2.77	2.83	0.24
725-749	0.63	0.25	1.21	1.15	0.00
750-774	0.64	0.23	1.04	1.25	0.71
775-800	0.24	0.02	0.63	0.48	0.00

n = 9022
mean score = 489.63
standard deviation = 118.05

Table A3.7: SAT® Mathematics – total score distribution by type of institution

Score Range	Overall %	Comprehensive %	Grammar %	Independent %	FE College %
200-224	1.06	1.36	0.12	0.72	3.32
225-249	0.42	0.63	0.00	0.19	0.95
250-274	1.31	1.96	0.29	0.67	1.18
275-299	2.25	3.24	0.63	1.39	1.90
300-324	3.01	4.29	0.63	1.73	4.74
325-349	2.98	4.06	1.10	1.83	4.27
350-374	4.02	5.39	1.73	2.74	4.27
375-399	4.88	6.77	2.19	2.64	5.45
400-424	7.79	10.05	4.04	5.86	7.11
425-449	6.06	7.36	3.86	4.90	6.16
450-474	11.46	12.37	10.50	10.09	11.85
475-499	5.89	6.00	6.29	5.62	4.27
500-524	9.64	9.05	10.90	9.94	9.72
525-549	4.80	4.12	6.52	4.90	4.98
550-574	8.41	6.73	10.50	10.52	8.53
575-599	4.17	3.22	5.71	4.76	5.69
600-624	6.52	5.18	8.54	7.97	6.16
625-649	2.95	1.96	5.13	3.65	1.66
650-674	5.32	3.22	9.28	7.20	3.55
675-699	2.52	1.42	4.33	3.79	1.18
700-724	2.67	0.98	4.96	4.80	1.90
725-749	0.41	0.23	0.46	0.82	0.24
750-774	0.75	0.21	1.50	1.44	0.47
775-800	0.70	0.19	0.81	1.83	0.47

n = 9022
mean score = 495.93
standard deviation = 118.68

Table A3.8: SAT® Writing – total score distribution by type of institution

Score Range	Overall %	Comprehensive %	Grammar %	Independent %	FE College %
200-224	0.67	0.65	0.06	0.82	2.61
225-249	0.35	0.38	0.06	0.48	0.71
250-274	0.65	0.56	0.23	0.91	2.13
275-299	0.78	0.96	0.23	0.67	1.42
300-324	1.36	1.86	0.06	1.30	1.42
325-349	1.61	2.09	0.52	1.20	2.61
350-374	3.45	4.24	1.21	3.03	5.69
375-399	4.37	6.02	1.10	2.83	6.64
400-424	7.57	10.41	3.06	5.00	6.64
425-449	6.47	8.26	3.86	3.99	9.24
450-474	12.66	15.20	9.23	9.89	11.61
475-499	7.94	9.01	7.27	6.05	7.82
500-524	13.47	13.09	16.55	11.96	12.56
525-549	9.30	8.24	12.11	9.75	7.58
550-574	9.21	7.19	13.55	10.81	6.40
575-599	6.99	4.70	10.78	9.32	5.92
600-624	5.60	3.47	8.48	8.50	3.55
625-649	2.84	1.71	4.27	4.47	1.66
650-674	2.80	1.17	4.21	5.57	1.90
675-699	0.85	0.36	1.38	1.49	1.18
700-724	0.61	0.27	1.27	0.86	0.47
725-749	0.24	0.08	0.23	0.62	0.24
750-774	0.11	0.02	0.17	0.29	0.00
775-800	0.10	0.06	0.12	0.19	0.00

n = 9022
mean score = 496.61
standard deviation = 92.27

Table A3.9: SAT Reasoning Test™ scores by ethnicity

Ethnicity	N	Critical Reading	Mathematics	Writing
Chinese	195	***409.5***	***594.6***	***408.2***
Black or Black British	157	***431.4***	***449.6***	***449.0***
Asian or Asian British	721	***436.7***	***483.4***	***453.6***
Other	115	***466.6***	***504.7***	***472.8***
Mixed	155	***490.0***	***490.3***	***497.8***
White	6494	***501.9***	***495.5***	***507.0***

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Table A3.10: SAT Reasoning Test™ scores by level of parental education

Highest level of education	N	Critical Reading	Mathematics	Writing
Mother – don't know	386	***454.0***	***475.6***	***465.2***
Mother – to 16	2139	***479.8***	***485.8***	***488.8***
Mother – to 18	1672	***498.6***	***502.6***	***505.6***
Mother – HE	2397	***534.2***	***535.2***	***529.9***
Father – don't know	411	***453.9***	***470.7***	***463.8***
Father – to 16	2055	***479.8***	***480.9***	***489.5***
Father – to 18	1206	***493.1***	***502.1***	***501.1***
Father – HE	2800	***532.1***	***535.1***	***528.4***

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Table A3.11: SAT Reasoning Test™ scores by parental occupation

Parental occupation (NS-SEC analytic classes)	N	Critical Reading	Mathematics	Writing
1.1 Large employers and higher managerial occupations	767	***521.8***	***522.0***	***521.0***
1.2 Higher professional occupations	1332	***543.8***	***547.8***	***538.2***
2 Lower managerial and professional occupations	1718	***510.6***	***511.4***	***515.4***
3 Intermediate occupations	576	***498.5***	***505.3***	***504.7***
4 Small employers and own account workers	616	***470.5***	***479.8***	***482.4***
5 Lower supervisory and technical occupations	342	***474.5***	***477.3***	***483.0***
6 Semi-routine occupations	376	***467.2***	***472.7***	***477.2***
7 Routine occupations	223	***462.1***	***469.8***	***472.1***
8 Unemployed (includes housewives, students, retired, etc)	282	***468.1***	***495.9***	***474.2***

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Table A3.12: SAT Reasoning Test™ scores by intention to go to university

	N	Critical Reading	Mathematics	Writing
Definitely not	181	***428.1***	***444.0***	***448.2***
Probably not	335	***431.4***	***433.1***	***452.2***
Probably	1657	***475.5***	***472.1***	***481.6***
Definitely	4597	***518.9***	***526.6***	***520.2***
Total	6770			

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Appendix 4: Functioning of the SAT®

The analyses are based on up to 9022 students who took the SAT® test in autumn 2005.

Functioning of the SAT®

A number of analyses were carried out to examine the way in which the test was functioning, as a complete test and at the individual item level. Where data was available comparisons of the US and UK samples were made to see if there were any differences in performance that might indicate that the SAT® test was unsuitable for the English sample. All of the analyses reported here are based on 9022 UK students. The US sample comprises 288,905 students that took the same version of the SAT® test in March 2005.

Englishsample

Facilities and omission rates

There were only seven items across the test as a whole where the facility (the percentage of test takers getting an item correct) was below 20 per cent and 11 items with omission rates above 20 per cent, indicating that the level of difficulty was appropriate for the sample. Almost all the items with omission rates above 20 per cent were amongst those items requiring student-produced responses in the first mathematics section (i.e. those with no multiple-choice options). A number of these items were classified as high difficulty items and therefore would be expected to produce low facilities and high omission rates. However, a small number of medium difficulty items in this section were also omitted by over 30 per cent of students. As these occurred at the end of the first mathematics section it may be that students had not paced themselves sufficiently or that students were put off by the unfamiliar grid format for recording their answers.

Discrimination

The discrimination of each item was also examined. The discrimination index for an item shows how well that item distinguishes between good and poorer performance, as measured by the test as a whole. It is calculated as the correlation between success on the item and the total score achieved on the remainder of the test and has a value between -1 and +1. A low discrimination may indicate that the item is measuring a different construct from the others in the test; items with very low discriminations detract from the internal consistency of the test. Almost all the items in the Critical Reading and Mathematics sections showed good discrimination. Writing items generally displayed acceptable levels of discrimination, although several items had discrimination values below 0.30 (generally considered to be a desirable value).

Reliability

For a test to be reliable it must be consistent in measuring the underlying construct (e.g. mathematical ability). The consistency of each section of the test was calculated using Cronbach's Coefficient Alpha – shown as a figure up to one. The closer the coefficient is to one, the more confident one can be that all the items are measuring the same construct. The results for the Critical Reading, Mathematics and Writing

sections of the SAT® were 0.94, 0.93 and 0.87 respectively. These are in line with the US figures and are acceptable reliabilities taking into account the number of items.

Bias

Against the background of the mean overall scores, analyses of differential item functioning (*dif*) were performed, comparing male and female students and 'Whites' with all 'Non-whites' on each section of the SAT®. *Dif* analyses are used to check for potential bias by identifying any differences in performance on particular items between two groups of pupils, taking their total scores into account. In other words they may indicate items which are disproportionately easy or difficult for a particular group of students. Screening of SAT® items for bias is carried out routinely in the US before items are included in live versions and during the earlier pilot very little evidence of bias was discovered amongst an English sample (McDonald *et al.*, 2001a). However, due to revisions to the SAT® since that time it was felt prudent to carry out *dif* analyses with the current sample.

In the three *dif* analyses comparing male and female students, only two items in the Critical Reading section and one in the Writing section showed a large degree of bias, all three items in favour of male students. In the comparison of 'Whites' and 'Non-whites', three items were found to exhibit a large degree of bias. In the Mathematics section one item favoured 'Whites' whilst another favoured the 'Non-whites' group and in the Writing section one item favoured 'Non-whites'. A simple reading of the questions exhibiting bias did not suggest any obvious reasons for differential performance on these items, except for the Mathematics item favouring 'Whites'. In this question it is possible that the words 'pail' and 'gallons' may have been less familiar to students from ethnic minority backgrounds.

Correlations between components

Correlation coefficients between scores on the various sections of the SAT®, including the two writing sub-scores, are shown in Table A4.1. All of these scores were positively correlated at a statistically significant level. Correlation coefficients indicate the association between two variables and therefore the extent to which the values of one variable can be predicted from the values of another. For example scores on the Critical Reading and Writing sections of the SAT® were highly correlated (0.80) indicating that these sections may be measuring similar constructs or abilities and that scores on one section are highly predictive of scores on the other. The correlation between the Mathematics section and the other two sections were more modest (0.57 and 0.50 respectively). The lowest correlations were between the essay sub-score and the other sections of the test, although as you would expect the essay correlated more highly with reading and writing than with mathematics.

Table A4.1: Correlations between SAT® scores

	Critical Reading score	**Mathematics score**	**Writing score**	**Writing m/c sub-score**	**Essay sub-score**
Critical Reading score	1.00	0.57	0.80	0.81	0.37
Mathematics score	0.57	1.00	0.50	0.54	0.14
Writing score	0.80	0.50	1.00	0.97	0.59
Writing m/c sub-score	0.81	0.54	0.97	1.00	0.37
Essay sub-score	0.37	0.14	0.59	0.37	1.00

Comparison of English and US samples

Table A4.2 shows the means obtained by the English and US student groups on each of the main components of the SAT®.

Table A4.2: Comparison of mean scores of American and English students

SAT® section	US		England	
	Mean	**s.d.**	**Mean**	**s.d.**
Critical reading	526	110	490	118
Mathematics	544	111	496	119
Writing	525	110	497	92
Number of students	288905		9022	

Although there are clear differences in the means of the two groups of students, a direct comparison of English and US means cannot be made. Due to the high stakes associated with the test in the US (almost every college considers SAT® scores as part of its admission process), it is likely that American students were generally more highly motivated than English students. It can also be assumed, for the same reason, that US students would have prepared more thoroughly than their English counterparts and therefore may have been more familiar with the types of questions and the format of the SAT® answer sheets (particularly the grids for entering student-produced responses within one of the mathematics sections). According to the College Board these particular US students turned out to be a relatively high scoring group. In the US, students can choose when to take the SAT® and, as March 2005 was the first administration of the new style SAT® containing the essay component, this appeared to attract a more able group than is usually the case. The means for over 1.4 million US high school graduates over the full year to April 2006 (and therefore using a number of different versions of the SAT®) were much closer to the UK means at 503, 518 and 497 for reading, mathematics and writing respectively (College Board, 2006).

Item functioning

In the 2001 pilot the SAT® test proved to perform similarly with a sample of English students compared to students in the US. However, as the SAT Reasoning Test™ has undergone some changes since that time, a comparison of the results of American and

English students was carried out at the individual item level to see if there were any differences in performance that might indicate that the SAT® test was unsuitable for the English sample. This consisted of an analysis of item facilities (the percentage of test takers getting an item correct) and omission rates (the percentage of students omitting an item) for the two groups.

Comparison of Item Facilities for US and English Candidates

ETS provided NFER with a spreadsheet showing the item characteristics for each of the eight sections of multiple choice items.

The table below describes briefly the characteristics of the eight sections analysed.

Table A4.3: Number of items per SAT® section

Section	Description	No. of items
2	Mathematics 2	18
3	Writing 1	35
4	Reading 2	23
5	Mathematics 1	20
6	Reading 1	25
7	Mathematics 3	16
8	Reading 3	19
9	Writing 2	14

For the English data, facilities were computed for each item – the percentage of all those doing the test who get the item right. For the US sample, a spreadsheet was provided with a variable PPLUS, which was described as being similar to the facility value. However, a detailed frequency breakdown for each item in the March 2005 administration was also provided by ETS, from which it was possible to extract both facilities and percentage omitting the item, and therefore item facilities and omission rates for the two samples were compared using these values.

The table below summaries the mean facilities for each section, and the correlations between English and US facility values.

Table A4.4: Comparison of SAT® facilities

Section	Description	Mean US facility	Mean English facility	Correlation
2	Maths 2	56	50	0.95
3	Writing 1	60	55	0.88
4	Reading 2	61	55	0.96
5	Maths 1	64	54	0.95
6	Reading 1	57	53	0.98
7	Maths 3	59	53	0.96
8	Reading 3	58	51	0.89
9	Writing 2	70	58	0.96

From the above it seemed that there was a fair measure of agreement at the item level between English and US performance, but that on most items the US facility was a few points higher than the English value. It should be noted that the derivation of scores from items is relatively complex – credit is subtracted for wrong answers, and this may have differentially affected the total scores for the two samples. To examine this in more detail, average omission rates for the two samples were compared.

An interesting feature of the data was that omission rates for items in the US sample seemed to vary more within sections than was the case for the English sample. This is illustrated in the second of the two figures below, which shows omission rate standard deviations within sections.

Figure A4.1: SAT® section omission rates

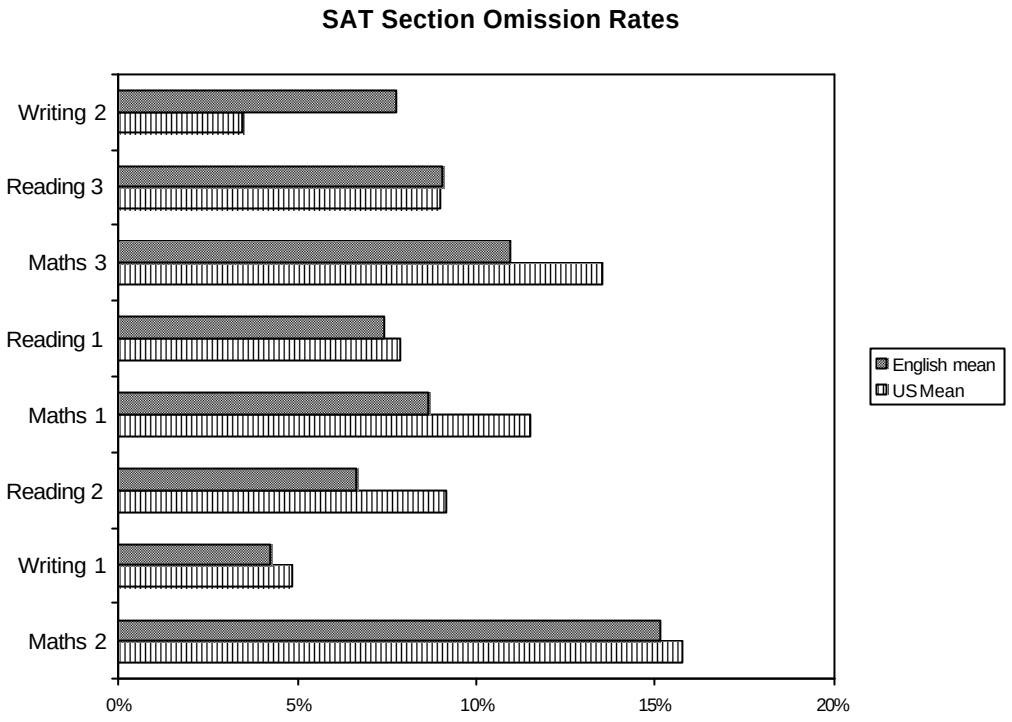
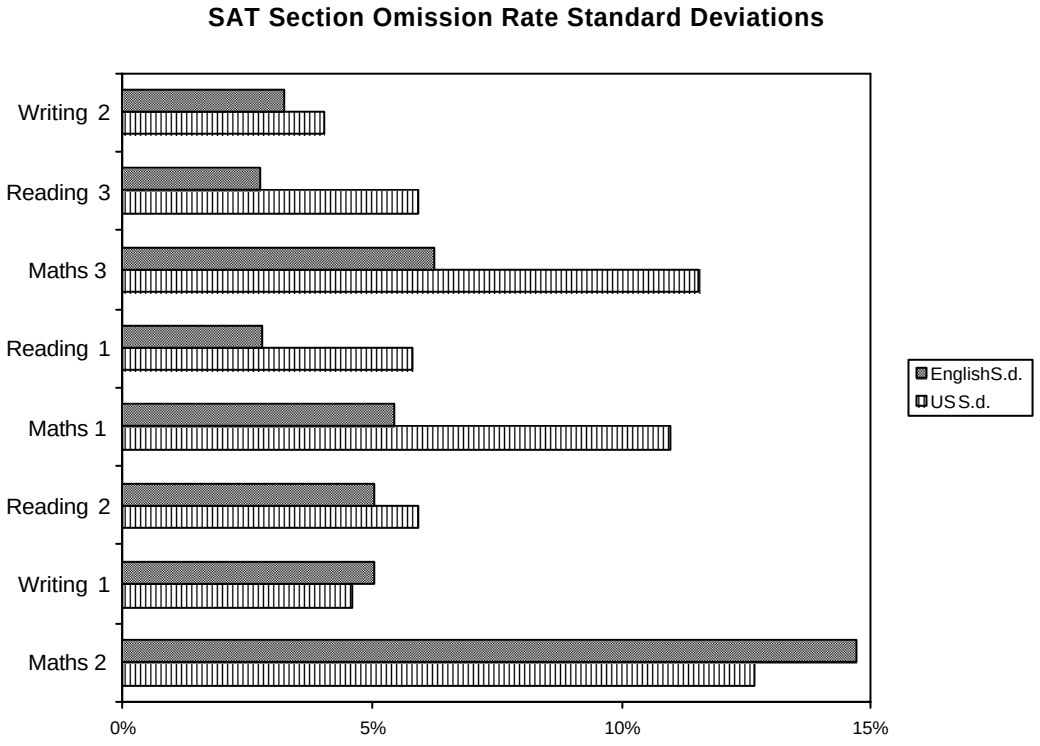


Figure A4.2: SAT® section omission rate standard deviations



As referred to above, the way in which SAT® scores are derived is complicated by the fact that on each multiple-choice item, a quarter-mark is deducted for each incorrect item (to discourage guessing). Although this would have been included in the instructions given to both groups, it is possible that English students may have overlooked this instruction, due to less preparation or motivation. The US variation in omission rates (particularly in the multiple-choice mathematics sections) suggests that American students were being more strategic in the items they omitted and this may have contributed to the difference in mean scores of the two groups.

As individual student-level data for items in the US group was not available, it was not possible to carry out an analysis of differential item functioning (*dif*) in the normal way. A 'pseudo-dif' analysis was therefore carried out by converting facilities within each of the three main areas to the log-odds metric and normalising differences in log-odds to pick up items where the difference was beyond the approximate 95 per cent confidence interval. This analysis identified 11 items where the performance of the two groups was significantly different; six in the Reading section, two in Writing and three in Mathematics. Eight of these items appeared to favour students in the English sample and the remaining five the US sample. No immediately obvious reasons for such differences were apparent, with the exception of one item in the Reading section - where the selection of the word 'archipelago' best fit the meaning of a sentence about Hawaii. As might be expected performance on this item was higher amongst the US sample.

Overall these results indicate that the individual SAT® items functioned in a similar way for the English and US samples. Detailed item statistics for the English sample can be found in tables A4.6 to A4.8 at the back of this appendix.

Effect of preparation

Each student participating in the SAT® trial was sent a test preparation booklet containing information about the types of questions in the test and how to fill in the answer grids for the student-produced response questions in the mathematics section. On the agreement form that students completed in order to participate in the study, a small number of questions were posed about the amount and type of practice that they had carried out in advance of taking the SAT®.

Three-quarters of the students who completed the SAT® indicated that they had received a copy of the preparation booklet from their school or college and three per cent reported that they had looked at the preparation materials on the College Board website. The amount of time students spent in preparing for the SAT® test is shown in Table A4.5.

Table A4.5: Time spent by students in preparation for the SAT® test

	Number	Per cent	Mean SAT® scores		
			Reading	Mathematics	Writing
No preparation	3327	36.9	***484.0***	***492.6***	***494.6***
Less than 15 minutes	1776	19.7	***512.2***	***516.3***	***512.4***
15-29 minutes	1070	11.9	***507.6***	***510.2***	***506.9***
30-59 minutes	625	6.9	***504.8***	***506.7***	***505.2***
1-2 hours	220	2.4	***501.6***	***511.9***	***504.6***
More than 2 hours	58	0.6	***443.5***	***468.8***	***467.4***
Missing	1946	21.6			
Total	9022	100.0			

Columns which are shown bold and in italics imply that for this outcome some categories are significantly different from others at (at least) the 5 per cent level.

Over a third of the students who took the SAT® carried out no preparation whatsoever and less than a quarter spent more than 15 minutes preparing for the test. When asked to indicate how they spent their preparation time just over a third of all students spent some time reading through the sample questions in the Critical Reading section, which was the first section in the preparation booklet. Less than twenty per cent of students claimed to have looked at the sample essays in the final section of the preparation booklet.

The mean scores of students who claimed to have carried out no preparation were lower than each of the preparation groups (with the exception of the group of students who claimed to have spent more than 2 hours preparing for the test), although not all of the differences were statistically significant and the relationship between the amount of preparation and mean scores was not linear. The highest mean in each section was achieved by the group who had spent less than 15 minutes in preparing for the SAT®. The very small group of students, who indicated a preparation time of over two hours, achieved significantly lower mean scores than all the other groups. It is possible that this group of students had not taken the test or the questions about preparation seriously and had given a facetious response. Alternatively, it is possible that these were diligent but much less able students. Overall the amount of preparation does not appear to have had a significant effect on the scores achieved, although a small amount of familiarisation was beneficial compared to no preparation whatsoever.

Table A4.6: Item analysis of Critical Reading section

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT401	80	2	0.31
SATIT402	29	5	0.28
SATIT403	59	2	0.43
SATIT404	28	5	0.23
SATIT405	21	4	0.33
SATIT406	84	2	0.33
SATIT407	73	2	0.41
SATIT408	30	3	0.25
SATIT409	14	5	0.18
SATIT410	62	2	0.38
SATIT411	56	4	0.36
SATIT412	77	3	0.50
SATIT413	45	4	0.34
SATIT414	56	4	0.33
SATIT415	68	8	0.49
SATIT416	63	7	0.46
SATIT417	56	10	0.38
SATIT418	77	8	0.50
SATIT419	52	12	0.47
SATIT420	65	12	0.50
SATIT421	54	14	0.54
SATIT422	61	17	0.42
SATIT423	41	19	0.38

Table A4.6: Item analysis of Critical Reading section (continued)

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT601	82	4	0.40
SATIT602	55	5	0.53
SATIT603	42	5	0.53
SATIT604	59	5	0.31
SATIT605	41	8	0.38
SATIT606	31	10	0.36
SATIT607	40	6	0.52
SATIT608	24	11	0.19
SATIT609	69	5	0.46
SATIT610	75	4	0.48
SATIT611	66	5	0.54
SATIT612	39	7	0.48
SATIT613	33	6	0.39
SATIT614	48	6	0.38
SATIT615	57	6	0.47
SATIT616	73	6	0.54
SATIT617	75	6	0.53
SATIT618	75	6	0.54
SATIT619	48	8	0.41
SATIT620	24	9	0.35
SATIT621	50	10	0.44
SATIT622	60	9	0.50
SATIT623	68	12	0.58
SATIT624	54	12	0.50
SATIT625	47	15	0.51

Table A4.6: Item analysis of Critical Reading section (continued)

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT801	77	6	0.51
SATIT802	74	6	0.41
SATIT803	30	10	0.28
SATIT804	51	7	0.45
SATIT805	33	6	0.43
SATIT806	29	11	0.41
SATIT807	57	7	0.49
SATIT808	68	7	0.44
SATIT809	68	7	0.51
SATIT810	28	8	0.22
SATIT811	64	8	0.52
SATIT812	42	9	0.44
SATIT813	54	9	0.49
SATIT814	21	10	0.25
SATIT815	51	10	0.47
SATIT816	49	12	0.43
SATIT817	53	12	0.47
SATIT818	62	13	0.54
SATIT819	53	15	0.49

Table A4.7: Item analysis of Mathematics section

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT201	90	1	0.35
SATIT202	87	1	0.27
SATIT203	87	1	0.30
SATIT204	69	2	0.44
SATIT205	41	7	0.39
SATIT206	38	8	0.44
SATIT207	43	6	0.38
SATIT208	23	11	0.46
SATIT209	85	2	0.28
SATIT210	67	6	0.42
SATIT211	61	22	0.47
SATIT212	58	9	0.46
SATIT213	31	33	0.60
SATIT214	22	21	0.43
SATIT215	35	35	0.54
SATIT216	29	26	0.53
SATIT217	28	34	0.56
SATIT218	9	48	0.39
SATIT501	88	3	0.37
SATIT502	79	4	0.50
SATIT503	79	3	0.37
SATIT504	69	3	0.43
SATIT505	80	5	0.44
SATIT506	74	3	0.45
SATIT507	64	7	0.55
SATIT508	73	3	0.38
SATIT509	53	9	0.48
SATIT510	61	7	0.55
SATIT511	54	9	0.39

Table A4.7: Item analysis of Mathematics section (continued)

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT512	40	10	0.46
SATIT513	43	8	0.47
SATIT514	38	7	0.57
SATIT515	33	9	0.45
SATIT516	52	14	0.49
SATIT517	38	13	0.42
SATIT518	31	17	0.35
SATIT519	27	22	0.48
SATIT520	13	17	0.18
SATIT701	81	5	0.36
SATIT702	83	5	0.45
SATIT703	76	6	0.41
SATIT704	61	9	0.47
SATIT705	80	6	0.47
SATIT706	56	7	0.59
SATIT707	61	7	0.44
SATIT708	46	10	0.54
SATIT709	55	8	0.49
SATIT710	46	10	0.46
SATIT711	52	7	0.35
SATIT712	32	16	0.47
SATIT713	38	17	0.49
SATIT714	33	15	0.37
SATIT715	19	21	0.24
SATIT716	22	26	0.35

Table A4.8: Item analysis of Writing section

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT301	75	1	0.29
SATIT302	80	1	0.26
SATIT303	82	1	0.24
SATIT304	53	1	0.38
SATIT305	78	1	0.22
SATIT306	44	2	0.33
SATIT307	58	1	0.30
SATIT308	46	1	0.20
SATIT309	45	1	0.25
SATIT310	22	2	0.16
SATIT311	53	1	0.33
SATIT312	92	1	0.29
SATIT313	21	2	0.22
SATIT314	90	1	0.26
SATIT315	78	1	0.32
SATIT316	61	2	0.31
SATIT317	76	1	0.36
SATIT318	65	2	0.41
SATIT319	86	2	0.33
SATIT320	13	2	0.19
SATIT321	69	2	0.27
SATIT322	55	3	0.24
SATIT323	26	4	0.24
SATIT324	78	3	0.38
SATIT325	23	4	0.30
SATIT326	18	5	0.28
SATIT327	21	6	0.25
SATIT328	48	6	0.43
SATIT329	66	7	0.34

Table A4.8: Item analysis of Writing section (continued)

Item	Facility (% correct)	Percentage Omitted	Discrimation
SATIT330	51	8	0.42
SATIT331	53	10	0.37
SATIT332	54	12	0.28
SATIT333	53	15	0.41
SATIT334	53	17	0.43
SATIT335	47	21	0.34
SATIT901	87	5	0.40
SATIT902	79	5	0.43
SATIT903	84	6	0.46
SATIT904	77	6	0.41
SATIT905	74	6	0.48
SATIT906	70	6	0.45
SATIT907	73	6	0.47
SATIT908	58	8	0.41
SATIT909	45	7	0.40
SATIT910	42	7	0.30
SATIT911	35	7	0.37
SATIT912	45	12	0.32
SATIT913	27	13	0.23
SATIT914	18	15	0.17

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