The impact of preparation on TSA and BMAT test results – an institutional case study at Oxford University

Final Report
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Executive summary

Project context
The project evaluated the impact of test preparation for University admissions tests on test performance with data from Oxford University. The topic is of particular relevance because an increasing number of undergraduate programmes – nationally in the UK but also internationally - require applicants to take an admissions test. The outcomes of these tests are considered for admission to University in addition to prior school attainment measures such as GCSE scores. However, how students prepare for admissions tests and if this preparation has an impact on their performance in the test is an under-researched area.

The research
This project first explored the relationships between student characteristics and test performance with Oxford University Admissions data from 2010 to 2015. Second, drawing on information from the Brasenose College survey on how students prepare for admissions tests, findings from a literature review and qualitative interviews with a sample of students, a survey was developed. It asked for information on how far in advance students started preparing for the test, the sources they used for test preparation, the support they received from various agents and the strategies students employed to prepare for the test. Third, the survey was administered to students who commenced their studies at Oxford University in October 2017 and data was analysed with multivariate analysis techniques.

Key findings

Test preparation matters.
Nearly all students prepare to take the test to some extent and frequently use a wide range of online resources. The most popular sources were the Oxford University Website, the official test provider website and The Student Room, with the majority of those who used them finding them to be quite or extremely helpful.

The most relevant aspect of test preparation that is positively related to test performance is the amount of time students start preparing in advance of the test.

Test preparation differs by school type.
Schools play an important role in supporting students to take and prepare for the admissions test by offering them opportunities to ask subject-specific questions or work with a subject teacher, receive general support/mentoring from a teacher and preparing in workshops or classes for the admissions test.
The amount of support that students receive to prepare for the tests differs by school type and indicators of socio-economic deprivation. Students from state schools receive fewer opportunities from schools to prepare for the admissions test. Students from state schools and those with an Overall WP Flag also have the least access to other forms of support: they received feedback on the past test papers they practiced less often and were less likely to have talked to former pupils at their school/college or former or current Oxford students who took the test.

**Results on the TSA and BMAT were related to student characteristics, potentially raising equity issues.**

A-Level results were highly associated with TSA and BMAT test performance and therefore success of being admitted to an Oxford University undergraduate programme. A-Level results remain positively related to test performance even for students who were admitted to the course for BMAT but not for TSA.

Other characteristics being equal, BME applicants, female applicants and those from deprived socio-economic areas performed less well in both the TSA and BMAT. These characteristics were associated with lower performances in TSA and BMAT performance even for students who were admitted to a course. Students’ demographic and socio-economic background characteristics explain a larger variance of BMAT scores than TSA scores.

Starting to prepare early for the tests counters the relative disadvantage associated with socio-economic deprivation, state school attendance and gender in TSA performance but not in BMAT performance.

**Implications**

The results of this project give evidence on how prior attainment and student background characteristics are related to performance in admissions tests. This understanding is essential for Universities’ policies on equality. For the University of Oxford, specifically, the results have direct implications for its outreach work, as they provide clear evidence that admissions tests and support in preparing for them is a higher hurdle for applicants from under-represented groups – especially those in state schools and from socio-economically deprived areas – for whom advice and support for taking these tests is essential. In addition, test providers may re-evaluate available preparation materials as not all of them are used with similar frequency or are perceived as helpful by all students.
1. Introduction

This study investigated the preparation of applicants for admissions tests for undergraduate programmes at the University of Oxford. At Oxford, admissions processes of a growing number of undergraduate programmes include admissions tests and the results of the tests influence decisions on whether applicants are invited for interviews and, potentially, whether they are offered a place.

Admissions tests are becoming more important in admissions processes in selective English higher education institutions (HEIs) but preparation is an under-researched area (Kirkup et al., 2010). While a 2010 BIS report concluded that SAT-style tests do ‘not add any additional information, over and above that of GCSEs and A levels (or GCSEs alone), at a significantly useful level’ (Kirkup et al., 2010, 4), selective universities have found admissions tests helpful in distinguishing between large numbers of high-achieving applicants.

HEIs in the UK often consider prior attainment at GCSE along with other information from candidates for admission to university. With evidence on prior attainment, HEIs aim to judge the suitability of candidates for the course and their ability to complete courses successfully. Admissions selection criteria are consistent with meta-analyses showing that prior attainment is correlated with performance in university courses. The relationship, however, is not large. Previous academic performance has an effect size of .30 in medicine, explaining for example 23% of variance in overall performance in medical school (Ferguson, James, & Madeley, 2002). For social science and humanities, effect sizes of d=.31 to d=.67 were found (Peers & Johnston, 1994). Particularly, prior attainment does not discriminate well among highly qualified candidates. This is one of the reasons why some HEIs with highly selective courses have introduced admissions tests as part of admission criteria. Another reason is that many students apply to HEIs with different qualifications and, compared to the constantly changing national qualifications taken by school students, admissions tests provide a common benchmark of academic ability. And still another reason is that admissions tests make it possible to compare students from very different educational backgrounds.

At Oxford, an increasing number of undergraduate programmes require applicants to take an admissions test. Of the 248 undergraduate courses offered in 2016, 232 required a pre-interview test or tests and only 14 courses have no test at all. There are 11 separate tests, although some of these, such as Modern Languages, are made up of multiple individual papers. In total 85% of all applicants registered for pre-interview tests in 2015. The Thinking Skills Assessment (TSA) is currently used for admissions to nine Oxford undergraduate programmes (Economics and Management, Experimental Psychology, Geography, History and Economics, Human Sciences, Philosophy and Linguistics, PPE, Psychology and Linguistics, Psychology and Philosophy). The Biomedical Admissions Test (BMAT) is used for Medicine and Biomedical Sciences at
Oxford. The TSA and BMAT are developed and administered by Cambridge Assessment Admission Testing (CAAT) and arise from the thinking skills tradition (Fisher, 2005).

The thinking skills tradition emerges from work in psychology and philosophy. Although there are different strands, they share the common idea that thinking skills can be taught directly as part of the curriculum, and that these skills involve cognitive processes such as arguing a case, decision-making, problem solving, explaining causes, evaluating, comparing and contrasting, judging credibility, clarifying and interpreting ideas and other higher-order thinking skills (Fisher, 2005).

Extensive research, including meta-analyses and experimental studies, shows that thinking skills teaching programmes can promote higher educational attainment and transferable skills across different subject areas and contexts (Adey & Shayer, 1994; Fisher, 2005; Higgins & Hall, 2004). Thinking skills are particularly relevant at the higher education level, where students are generally expected to think for themselves and work independently. Consistently, research shows that thinking skills tests like the TSA and BMAT predict course degree marks in university over and above A-levels (e.g., Black, 2012; Emery, 2009; O’Hare & McGuinness, 2015). That is another reason HEIs consider these tests as part of the admission selection criteria.

The TSA has two sections. The first is composed of 50 multiple-choice questions and students have 90 minutes to complete them. The second section is a writing task, which students have 30 minutes to complete. As the writing section scores are not used as part of the selection process to Oxford University courses, data from section 2 of the TSA were not included in this research. TSA section 1 addresses “problem-solving skills, including numerical and spatial reasoning. Critical thinking skills, including understanding argument and reasoning using everyday language.”

The BMAT is composed of three sections; candidates are allowed 60 minutes for the first section and 30 minutes for sections 2 and 3, making the examination 2 hours in duration. The first section is composed of 35 multiple-choice questions and addresses “generic skills in problem solving, understanding arguments and data analysis and inference.” Section 2 contains 27 multiple-choice questions, which test “The ability to apply scientific knowledge typically covered in schoos Science and Mathematics by the age of 16 (for example, GCSE in the UK and IGCSE internationally).” The final section is a writing task in which candidates choose from one of three questions designed to test “The ability to select, develop and organise ideas, and to communicate them in writing, concisely and effectively.”

Test preparation

Test preparation has been the subject of considerable research more broadly and was intensively researched in the 1980s in the US, in relation to the SATs (university

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1 https://www.admissionstesting.org/for-test-takers/thinking-skills-assessment/tsa-oxford/about-tsa-oxford/
2 https://www.admissionstesting.org/for-institutions/about-our-tests/biomedical-admissions-test/
A general conclusion from this work was that no test can distinguish between aptitude and performance: they assess performance (Powers, 1985; Slack & Porter, 1980). It had previously been argued that some tests could assess underlying potential, even if a student was not currently performing at a high level. A recent case in which this notion was disabused was Durham University’s Centre for Educational Measurement’s 11+ test, as research indicated that test preparation had an effect upon outcomes. This recent example demonstrates that despite the earlier research in this area, perceptions that a pure form of potential can be assessed persist in some quarters.

Studies on test preparation, cramming and drilling have found increases in students’ scores (e.g. Bangert-Drowns, Kulik, and Kulik 1983; Bunting and Mooney 2001; Messick and Jungeblut 1981; Powers 1986; Sturman 2003). Access to test preparation materials, similarity of the materials to the actual assessments, the number of practice tests, time on task and higher ability students have all been associated with higher performances (Kulik, Bangert-Drowns & Kulik, 1984; Powers and Swinton, 1984; Griffin, Carless & Wilson, 2013). Analytical and quantitative tasks show higher gains from repeated test-taking than do verbal tasks (Hausknecht, Halpert, Di Paolo & Moriarty Gerrard, 2007). These studies have typically been conducted for tests that do not have an associated curriculum, just like the BMAT and the TSA (unlike, for example, A-levels). Section 2 of the BMAT does assess scientific knowledge, though, so may operate more like curriculum-related assessments for that proportion of the test.

Four explanations for students’ score gains exist in the literature (Arendasy, Sommer, Guiterrez-Lobos & Punter, 2016) (Table 1.1). The first states that test familiarity in itself is a cause of increased scores, even if this gain is not relevant to the construct being assessed. Such gains do not impact upon students’ abilities, only on their performances. A second model posits that drilling on test-specific techniques (such as how to eliminate optional responses without a deep understanding of the question) would have similar effects to model 1 in terms of impact upon performance and ability. A third model involves teaching construct-relevant material to students so they perform better on test questions and this impacts their ability in a domain-specific manner. A fourth model is that of general teaching and learning strategies which would be expected to both impact upon performance and produce generalised improvements in students’ abilities.

Table 1.1: Test preparation models

<table>
<thead>
<tr>
<th>Model</th>
<th>Construct relevance</th>
<th>Cause</th>
<th>Impact on performance</th>
<th>Impact on ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
<td>Test familiarity</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>Test coaching tips and tricks</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

In research on a medical entrance examination at the University of Vienna, Arendasy et al. (2016) demonstrated that Model 3 best explained their findings. Test preparation, in their sample of students, had test-specific and domain-specific effects but in keeping with other studies, the gains from test preparation did not transfer to general intelligence (g) or even to general natural science knowledge. It was previously known that practising test items did not increase general intelligence (Arendasy & Sommer, 2013), but the finding with respect to domain-specific generalisation was new.

Preparation for thinking skills admissions tests like the TSA and BMAT is an under-researched area. There is evidence that GCSE and A-levels results correlate positively with SAT-style tests (Kirkup et al., 2010), but little is known about preparation for the TSA and BMAT tests. In a recent study Gallacher, McElwee and Cheung (2017) studied preparation strategies for the BMAT with survey data from a convenience sample. The authors found that the great majority of candidates use the BMAT website for accessing preparation materials. Regression analysis results suggested that attempting practice papers under timed conditions was an effective strategy for higher test scores across all BMAT sections. There was no indication that extra help from schools, commercial courses or coming from an Independent school was positively related to higher BMAT scores once other factors were controlled for.

Conceptually, enhancing thinking skills through educational programmes and studies (GCSE, A-Levels, thinking skills courses) should be distinguished from preparations that aim to improve test-taking skills. While the former would support skills necessary for students’ study, the latter would merely develop strategies to enhance test-taking skills.4

This study will investigate preparation for the TSA and BMAT with data from on-course University of Oxford students. The following research questions will be addressed.

**Research questions**

The guiding research question this study seeks to answer is:

- What is the impact of preparation for university admissions tests on test performance?

This question comprises a number of sub-questions:

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4 This project did not aim to disentangle the two concepts of preparation for thinking skills tests (theoretically or empirically) and instruments have not been designed accordingly. Where appropriate a distinction is attempted in the discussion of results.
- To what extent do students prepare for university admissions tests and what is the nature of this preparation amongst students with different background characteristics?
- What are the connections between student characteristics and test preparation and performance?
- Which prior qualifications and subjects are connected with test preparation and better test performance?
- Is the time of application connected with preparation for, and better performance in, tests?
- What amount, timing and nature of preparation are connected with better test performance?
- Is the influence of test preparation on test performance mediated or moderated by student characteristics and background?
- What learning strategies and sources of support are connected with better test performance?

**Study phases**

The research questions are addressed in two connected phases.

**Phase 1: Exploration of student characteristics, test performance and admissions tests preparation**

1. Exploration of the relationship between student characteristics and test performance

Multiple regression analysis examined the association between applicant characteristics and performance in TSA and BMAT tests for students from the UK. A number of characteristics were considered, such as BME status, gender, prior attainment (GCSE and A-Level results), and school type origin.

One of the underlying questions was whether certain GCSEs and A-Levels increase the likelihood of good test results or not, i.e. which qualifications seem to provide a good preparation for these two admissions tests. This analysis allowed us to determine whether test result differences that seem to be linked to candidate background persist when GCSE and A-Level attainment was controlled for. The work of student-level data also provided insights into connections between test results and other background variables (e.g., type of schooling, POLAR quintile).

2. Additional analysis based on student survey responses

In a separate survey, collected by Brasenose College at Oxford over the last three years, students were asked in an open-ended question whether and how they
prepared for admissions tests, including whether test preparation was provided by students’ schools or based on students’ own initiative. Thematic analysis of this data allowed us to identify potential connections between amount and nature of preparation, type of schooling and other background variables.

3. Application date as a proxy for the amount of test preparation

Preliminary analysis of with Brasenose College admissions data has revealed that the date of application is significantly related to admissions success. After controlling for GCSE performance, applicants who apply early have a higher chance of obtaining an offer and gaining a place. One possible explanation is that early applying applicants have more time and support to prepare for admissions tests and are therefore more likely to achieve higher test scores and a higher proportion of offers. The study will explore this and alternative explanations further, using the university wide dataset, and directly examining the relationship between application date and TSA and BMAT performance.

4. Qualitative investigation of the impact of preparation on test experience and results

Based on insights gained in 1 – 3 and previous research on test preparation this study generates qualitative data to explore the usefulness of different preparation materials and modes. This was achieved by conducting follow-up interviews with a sample of survey respondents who have experienced different levels and types of preparation. The interviews allowed us to explore in a qualitative manner some of the widely-held assumptions regarding preparation for university admissions tests, for instance that material recommended by test developers is the focus of students’ preparations. Most importantly the interviews informed the development of the survey instrument in Phase 2.

Phase 2: Analysis of admissions tests preparation and test performance

Based on the findings of Phase 1 a survey was developed and piloted (Appendix E) to newly admitted undergraduate students who commenced their studies in October 2017. The survey includes items in the following areas:

- How early students started preparing for the admissions tests
- How much students prepared for the admissions tests
- Use of past test papers and ways of practicing with them
- Sources of support in preparation process
- Usefulness of different types of preparation materials
Additionally, the survey included the scales on student learning strategies (e.g., memorisation, elaboration, and control strategies), widely used in the context of the PISA study (Marsh, Haug, Artelt & Baumert, 2006; Säälik, Nissinen & Malin, 2015) and adapted for high-stakes tests in previous research by the Oxford University Centre for Educational Assessment (Baird, Hopfenbeck, Elwood, Caro & Ahmed, 2015). The questionnaire includes various types of questions, ranging from closed questions, to Likert scale items and open-ended questions. The survey is administered by Oxford University’s Student Data Management and Analysis team via Online Surveys (formerly BOS) and piloted with a substantial sample of incoming students commencing their studies in October 2017. The survey is linked to student records, which allows analysis similar to that undertaken for smaller samples of students in Phase 1, but employing much more detailed data on test preparation and sophisticated methods.

Next to descriptive statistics, multivariate analysis is employed. Factor analysis evaluated the structure of student responses (e.g., learning strategies scale). Regression analysis examined the association between student preparation variables and test results whilst taking into account differential effects for background characteristics of students (e.g., BME status and gender). The latter is in line with findings from large-scale assessment suggesting that preparation strategies vary by the student's gender and socio-economic status (e.g., OECD, 2010). The data from the survey will also be used to explore whether the influence of test preparation on test performance is mediated (explained) or moderated (differentially affected) by student characteristics and background.

Aim and structure of the report

This Final Report presents the results of Phase 1 and Phase 2. It is structured as follows:

Sections 2 to 5 discuss the findings from Phase 1. Section 2 reports analysis of the association between TSA/BMAT scores and characteristics of students (e.g., GCSE/A-levels and socio-economic background) using large-scale Oxford admission data across five years and different courses. Section 3 presents open-ended responses of students at Brasenose College on how they prepared for admission exams. Section 4 presents the procedure of developing and administering interviews with 10 candidates. Section 5 discusses main results of Phase 1.

Sections 6 to 8 report on the findings from Phase 2. Section 6 outlines the development of the survey, the sample and used variables for the 2017/2018 cohort. Section 7 presents the analysis and results including descriptive statistics and associations between test preparation, student background characteristics and test performance. Section 8 discussed the overall findings of the project.

2. Analysis of Oxford admission data

This section presents results of analysis of Oxford admission data on the relationship between test scores on admissions tests (i.e., TSA and BMAT) and applicants’
characteristics. Results of descriptive analysis and regression analysis are presented. Two samples are considered for analysis, one for the TSA test and another for the BMAT test.

### 2.1 Sample

The total TSA sample consisted of 9,886 home (UK domiciled) applicants across the 2010 – 2015 Universities and Colleges Admissions Service (UCAS) cycles. The total BMAT sample consisted of 7,175 home applicants across the 2009 – 2015 UCAS cycles. For multivariate analysis, the sample was further restricted to applicants with GCSE/A-level results and relevant socio-economic characteristics (available by UK postcode), resulting in a final TSA sample size of 7,032 and a final BMAT sample size of 5,301. The TSA sample included applicants for the following courses: Economics & Management (n=2,169), Experimental Psychology (n=741), Geography (n=674), ‘Politics, Philosophy and Economics’ (n=3,168) and ‘Psychology, Philosophy and Linguistics’ (n=280). The BMAT sample included applicants to the following courses: Biomedical Sciences (n=190) and Medicine (n=5,111).\(^5\)

### 2.2 Variables

For both TSA\(^6\) and BMAT scores the overall scores were used in the analysis. TSA and BMAT scores have been standardised by Z-scoring. Note that scores were standardised within each UCAS cycle and course group separately. This was carried out for two main reasons. (1) Standardisation within each UCAS cycle aims to account for year to year fluctuations in the difficulty of the test. Note that within cycle standardisation was also applied to GCSE and A-level attainment measures. (2) Due to the limitations in the central admissions database (ADSS), scores supplied by Cambridge Assessment have been recorded for all courses taking TSA as well as medicine applicants taking the BMAT across the UCAS cycles. In Biomedical Sciences, BMAT scores have been recorded in a standardised format across the UCAS cycles. This left no other option than to standardise all test scores within each course separately.\(^7\) Further, BMAT scores were weighted according to Oxford’s selection procedures.\(^8\)

The following variables were considered as statistical predictors of TSA and BMAT scores.

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\(^5\) Note: Numbers deviate from the Interim Report, as test scores for the Biomedical Sciences course have been incorrectly assigned to TSA due to ADSS test storage issues. Subsequent analysis has been corrected for this error in the present report.

\(^6\) For the TSA only the multiple choice sections assessing critical thinking and problem solving skills are included in the overall score.

\(^7\) Note: Standardisation of BMAT test scores across Medicine and Biomedical Sciences courses does, due to the different formats in which the scores were recorded, not eliminate comparability issues of the scores. However, Appendix B compares the analysis conducted in Table 2.3 for BMAT with the combined Medicine and Biomedical Science scores with results for BMAT scores of Medicine students only. Differences in results are negligible and subsequent analysis for BMAT is conducted and reported with the combined standardised scores from Medicine and Biomedical Sciences.

\(^8\) [https://www.medsci.ox.ac.uk/study/medicine/pre-clinical/statistics](https://www.medsci.ox.ac.uk/study/medicine/pre-clinical/statistics)
• School type: Dummy variables indicate applicant’s school type (state, independent, or other). State and other schools are compared with independent schools in regression models. The ‘other’ category is mainly overseas schools.

• BME: Dummy variables indicate black and minority ethnic (BME) status (yes, no, or don’t know/refuse).

• Application time: The number of days between 1st September and the application date (UCAS form received by Oxford). The reference date of 1st September was chosen because this is close to the application deadline. The precise reference date does not affect the statistical results. Smaller values reflect early appliers. Resulting regression coefficients were multiplied by 10 for ease of interpretation.

• ACORNFLAG: Dummy variable indicates socio-economic adversity according to UK postcode. Where a candidate’s postcode falls into ACORN groups four or five (‘Financially Stretched’ and ‘Urban Adversity’) the application was flagged.

• POLAR3FLAG: Dummy variable indicates low participation in higher education according to UK postcode. The POLAR classification places regions into quintiles based on the rate of young participation in Higher Education. Applicants from the lowest two quintiles were flagged.

• PRE16SCHOOLFLAG: Dummy variable indicates performance of applicant’s school at GCSE is below national average.

• POST16SCHOOLFLAG: Dummy variable indicates performance of applicant’s school at A-level is below national average.

• WPOVERALLFLAG (widening participation): Dummy variable indicates whether the applicant has obtained one of more school flags (pre or post 16) and one or more geodemographic flags (ACORN or POLAR3) or has previously been in care.

• GCSE A*: The number of A* grades (only including applicants with 5 or more GCSEs). GCSE scores were transformed into z-scores.

• A-level A/A*s: The number of A or A* grades. A-levels scores were transformed into z-scores. (Note that A-levels are taken after the TSA or BMAT for most students, but were included in the model as a proxy for applicants’ concurrent attainment levels.)

• School history of application: It is equal to the raw number of applicants between 2011 and 2016, per school. It reflects the school history of applying to Oxford.

• UcasCycle: This is the application cycle in which an application was made, and refers to the year of entry for the majority of those applying. For example, applications made in the 2014 Universities and Colleges Admissions Service (UCAS) Cycle were made by 15 October 2013, for entry in October 2014 (majority), or deferred entry in October 2015 (minority).

• A-level subjects: Dummy variables indicate applicant’s A-levels choices (Art, Biology, Business Studies, Chemistry, Computing, Economics, English, English Language, English Literature, Further Mathematics, Further Additional, Geography, History, Languages, Law, Mathematics, Philosophy, Physics, Psychology, Religious Education, Science Other, Social Science, and Other).
2.3 Descriptive analysis

Table 2.1 and 2.2 report descriptive statistics for selected variables in the TSA and BMAT samples analysed. Percentage of applicants and mean test scores are reported by school type.

Table 2.1 and 2.2 show that the percentage of applicants from disadvantaged areas according to ACORNFLAG and POLAR3FLAG is relatively low in independent schools (around 4% for TSA applicant and around 7% for BMAT applicants), but higher in state and other schools (around 14% in TSA applicant and between 16% and 20% in BMAT applicants). In terms of educational attainment, candidates from independent schools perform better at GCSE and A-levels than candidates from state and other schools. GCSE and A-level performance is particularly low for candidates from other schools.

Table 2.1: TSA analytic sample: descriptive statistics (% of applicants and mean scores). Home (UK domiciled) applicants only (N=9,886).

<table>
<thead>
<tr>
<th>School, type</th>
<th>Independent</th>
<th>Other</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentages</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>38%</td>
<td>34%</td>
<td>42%</td>
</tr>
<tr>
<td>BME</td>
<td>22%</td>
<td>30%</td>
<td>24%</td>
</tr>
<tr>
<td>ACORN Flag</td>
<td>3%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>POLAR3 Flag</td>
<td>5%</td>
<td>15%</td>
<td>14%</td>
</tr>
<tr>
<td>Pre 16 School Flag</td>
<td>2%</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>Post 16 School Flag</td>
<td>1%</td>
<td>7%</td>
<td>29%</td>
</tr>
<tr>
<td>Overall WP Flag</td>
<td>1%</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Means</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCSE (z-score)</td>
<td>0.44</td>
<td>-0.68</td>
<td>-0.18</td>
</tr>
<tr>
<td>A-levels (z-score)</td>
<td>0.14</td>
<td>-0.33</td>
<td>-0.13</td>
</tr>
<tr>
<td>TSA*</td>
<td>62.31</td>
<td>59.31</td>
<td>60.45</td>
</tr>
<tr>
<td>TSA (z-score)</td>
<td>0.36</td>
<td>-0.10</td>
<td>0.11</td>
</tr>
</tbody>
</table>

*Excludes recorded TSA scores of less than 10 to exclude outliers which were considered to be unexplained missing data.

Note: Home applicants who have taken the TSA only (2010 – 2015 UCAS cycles). For comparability, GCSE and A-levels scores were scaled (i.e., z-scores) to have a mean of zero and a standard deviation of one.

Table 2.2: BMAT analytic sample: descriptive statistics (% of applicants and mean scores). Home (UK domiciled) applicants only (N=7,175).

<table>
<thead>
<tr>
<th>School, type</th>
<th>Independent</th>
<th>Other</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentages</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>52%</td>
<td>60%</td>
<td>54%</td>
</tr>
<tr>
<td>BME</td>
<td>35%</td>
<td>44%</td>
<td>38%</td>
</tr>
<tr>
<td>ACORN Flag</td>
<td>6%</td>
<td>20%</td>
<td>16%</td>
</tr>
<tr>
<td>POLAR3 Flag</td>
<td>8%</td>
<td>16%</td>
<td>17%</td>
</tr>
</tbody>
</table>
## 2.3.1 TSA and BMAT performance by characteristics of applicants

As with GCSE and A-levels results, Table 2.1 and 2.2 suggest that applicants from independent schools perform slightly better in the TSA and BMAT compared to applicants from state schools and other schools. Note that mature students are more likely to be included in the ‘other’ category, with approximately 17% being aged 19 or over in this group, compared with 5% in the overall dataset.

We wanted to evaluate whether performance gaps in admissions tests across different schools were explained by prior attainment of candidates. Figure 2.1 displays TSA performance by school type for candidates with equivalent GCSE results, that is, belonging to the same GCSE attainment quartile (see also Table A1 in Appendix A). The x-axis locates candidates according to GCSE quartiles and the y-axis depicts TSA standardised scores.

When we look at candidates with equivalent GCSE results, evidence of a TSA performance gap favouring independent schools can only partly be confirmed. Candidates of independent schools and state schools perform fairly similarly in the TSA test, particularly at higher GCSE levels. There is only weak evidence that candidates from independent schools perform better than candidates from state schools at the lowest GCSE quartile. ANOVA analysis confirmed that the difference is significant ($F (1, 9068) = 6.06, p = 0.014$). Still, it is the attainment in GCSE that explains most of the variation in TSA scores between state and independent schools.

These results are explored further in regression analysis controlling for more characteristics in the next section.

**Figure 2.1: Average TSA standardised scores by GCSE quartiles and school type (home applicants only)**
Figure 2.2 presents the TSA performance for female and male candidates by GCSE quartile (see also Table A2 in Appendix A). Results consistently show that male candidates performed better than female candidates in TSA across GCSE attainment levels. ANOVA analysis confirmed that the difference is significant ($F (1, 9293) = 340.02, p < 0.001$). The gender gap is relatively stable across students with different GCSE levels.

Figure 2.3 depicts the gap in TSA outcomes for BME and White candidates across GCSE quartiles (see also Table A3 in Appendix A). Candidates with BME background perform worse in TSA than White candidates. ANOVA analysis confirmed that the difference is significant ($F (1, 9289) = 130.30, p < 0.001$). The TSA score gap related to BME background appears to be larger for students with lower GCSE scores, in the first quartile ($F (3, 9289) = 6.39, p < 0.001$).

**Figure 2.2: Average TSA standardised scores by GCSE quartiles and gender (home applicants only)**
Similarly, Figures 2.4 to 2.6 display performance gaps in BMAT scores across different types of school, student gender and BME status by prior attainment of candidates. Candidates from independent schools score significantly higher than those from state schools ($F(1, 6595) = 48.50, p < 0.001$). The difference is stable across GCSE quartiles ($F(3, 6595) = 0.96, p = 0.41. N.S.$) (Figure 2.4).

Figure 2.5 presents the BMAT performance for female and male candidates by GCSE quartile. Results consistently show that male candidates performed significantly better than female candidates in BMAT across GCSE attainment levels ($F(1, 6745) = 324.48, p < 0.001$). The gender gap is stronger at lower and higher GCSE levels ($F(3, 6745) = 2.77, p < 0.05$).

Figure 2.6 presents the BMAT performance for BME status by GCSE quartile. Results consistently show that candidates with a BME status performed significantly lower than candidates without BME status in BMAT across GCSE attainment levels ($F(1, 6423) = 182.90, p < 0.001$). The gap is stronger at lower GCSE levels ($F(3, 6423) = 9.83, p < 0.001$).
Figure 2.4: Average BMAT standardised scores by GCSE quartiles and school type

Figure 2.5: Average BMAT standardised scores by GCSE quartiles and gender

Figure 2.6: Average BMAT standardised scores by GCSE quartiles and BME status
2.4 Regression results

Linear regression models were used to investigate statistical prediction of TSA and BMAT scores. Unstandardised regression coefficients and associated standard errors are reported in Table 2.3.

Table 2.3: Regression of TSA and BMAT scores on student and school characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>TSA</th>
<th>BMAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>16.70</td>
<td>11.79</td>
</tr>
<tr>
<td>Gender (Female = 1)</td>
<td>-0.21</td>
<td>0.02</td>
</tr>
<tr>
<td>School type (Other = 1)</td>
<td>-0.13</td>
<td>0.23</td>
</tr>
<tr>
<td>School type (State = 1)</td>
<td>0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>BME (don’t know/refuse =1)</td>
<td>-0.18</td>
<td>0.04</td>
</tr>
<tr>
<td>BME (Yes = 1)</td>
<td>-0.39</td>
<td>0.02</td>
</tr>
<tr>
<td>ACORN Flag</td>
<td>-0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>POLAR3 Flag</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Pre 16 School Flag</td>
<td>-0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Post 16 School Flag</td>
<td>-0.09</td>
<td>0.03</td>
</tr>
<tr>
<td>Overall WP Flag ⁹</td>
<td>-0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Application time</td>
<td>-0.43</td>
<td>0.19</td>
</tr>
<tr>
<td>GCSE A* (z scored)</td>
<td>0.23</td>
<td>0.01</td>
</tr>
<tr>
<td>A-level A/A* (z scored)</td>
<td>0.20</td>
<td>0.02</td>
</tr>
<tr>
<td>School history of application</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>UcasCycle</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

⁹ TSA: 467 applicants were WP flagged out of a sample of 7,032. BMAT: 479 applicants were WP flagged out of a sample of 5,301.
<table>
<thead>
<tr>
<th>A-Level</th>
<th>0.02</th>
<th>0.05</th>
<th>-0.01</th>
<th>0.06</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Level Biology</td>
<td>0.01</td>
<td>0.03</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>A-Level Business Studies</td>
<td>0.03</td>
<td>0.06</td>
<td>0.17</td>
<td>0.28</td>
</tr>
<tr>
<td>A-Level Chemistry</td>
<td>-0.04</td>
<td>0.03</td>
<td>0.31</td>
<td>0.14</td>
</tr>
<tr>
<td>A-Level Computing</td>
<td>0.18</td>
<td>0.17</td>
<td>0.26</td>
<td>0.33</td>
</tr>
<tr>
<td>A-Level Economics</td>
<td>0.10</td>
<td>0.03</td>
<td>**</td>
<td>0.24</td>
</tr>
<tr>
<td>A-Level English</td>
<td>-0.01</td>
<td>0.07</td>
<td>0.22</td>
<td>0.14</td>
</tr>
<tr>
<td>A-Level English Language</td>
<td>-0.08</td>
<td>0.06</td>
<td>0.04</td>
<td>0.17</td>
</tr>
<tr>
<td>A-Level English Literature</td>
<td>-0.07</td>
<td>0.03</td>
<td>*</td>
<td>-0.07</td>
</tr>
<tr>
<td>A-Level Further Mathematics</td>
<td>0.17</td>
<td>0.03</td>
<td>***</td>
<td>0.27</td>
</tr>
<tr>
<td>A-Level Further Additional</td>
<td>0.00</td>
<td>0.00</td>
<td>*</td>
<td>0.00</td>
</tr>
<tr>
<td>A-Level Geography</td>
<td>-0.11</td>
<td>0.03</td>
<td>**</td>
<td>-0.11</td>
</tr>
<tr>
<td>A-Level History</td>
<td>-0.06</td>
<td>0.03</td>
<td>*</td>
<td>-0.01</td>
</tr>
<tr>
<td>A-Level Languages</td>
<td>-0.09</td>
<td>0.03</td>
<td>**</td>
<td>-0.05</td>
</tr>
<tr>
<td>A-Level Law</td>
<td>-0.08</td>
<td>0.10</td>
<td>-0.63</td>
<td>0.37</td>
</tr>
<tr>
<td>A-Level Mathematics</td>
<td>0.22</td>
<td>0.03</td>
<td>***</td>
<td>0.12</td>
</tr>
<tr>
<td>A-Level Other</td>
<td>0.13</td>
<td>0.03</td>
<td>***</td>
<td>0.09</td>
</tr>
<tr>
<td>A-Level Philosophy</td>
<td>0.29</td>
<td>0.05</td>
<td>***</td>
<td>0.25</td>
</tr>
<tr>
<td>A-Level Physics</td>
<td>0.16</td>
<td>0.03</td>
<td>***</td>
<td>0.11</td>
</tr>
<tr>
<td>A-Level Psychology</td>
<td>0.11</td>
<td>0.04</td>
<td>**</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Religious Education</td>
<td>0.10</td>
<td>0.04</td>
<td>**</td>
<td>0.17</td>
</tr>
<tr>
<td>A-Level Science Other</td>
<td>0.07</td>
<td>0.15</td>
<td>-0.31</td>
<td>0.20</td>
</tr>
<tr>
<td>A-Level Social Science</td>
<td>0.07</td>
<td>0.08</td>
<td>-0.14</td>
<td>0.21</td>
</tr>
</tbody>
</table>

p<0.05 (*), p<0.01 (**) and p<0.001 (***)

The combined set of predictors explains 27% of the variance of the TSA score and the BMAT score. Overall, results of the TSA model with the full set of control variables indicated:

Significantly higher performance for,

- State schools applicants (relative to independent school applicants)
- Applicants from schools with a history of applying to Oxford
- Applicants with higher A-Level and GCSE scores
- Applicants who applied earlier
- Applicants who chose the following A-level courses: Economics, Further Mathematics, Mathematics, Philosophy, Physics, Psychology, Religious Education and Other.

And significantly lower performance for,

- BME applicants (relative to White applicants)
- Female applicants
- ACORN flagged applicants
• Post 16 school flagged applicants
• A-level courses: English Literature, Geography, History, Languages

Overall, results of the BMAT model indicated:

Significantly **higher performance** for,

• Applicants from schools with a history of applying to Oxford
• Applicants with higher A-level and GCSE scores
• Applicants who applied earlier
• Applicants who applied in a later UCAS cycle
• A-level subjects: Chemistry, Economics, Mathematics, Further Mathematics, Philosophy, Physics, and Religious Education and Other.

Significantly **lower performance** for,

• Female applicants
• BME applicants (relative to White applicants)
• ACORN flagged applicants
• Overall WP applicants (relative to non-flagged applicants)

In descriptive analysis we had shown that applicants from independent schools performed better than candidates from state schools in the TSA and BMAT tests. For the TSA, we had seen that this difference was significant, however, that the gap between candidates from independent and state schools was largely explained by GCSE prior attainment. Additionally, regression results in Table 2.3 indicate that applicants from state schools perform slightly better in TSA than candidates from independent schools once the full set of socio-demographic and prior attainment characteristics are considered. The table also shows that there is no significant difference between candidates from independent or state schools in BMAT, once the same set of socio-demographic and prior attainment characteristics are considered.

That is, applicants from state schools perform better (TSA) or equal to (BMAT) applicants from independent schools with equivalent GCSE/A-levels results, socio-economic background, and other characteristics considered in models (see Table 2.3). Whilst a reduced number of candidates in state and independent schools might share prior attainment and socio-economic background characteristics included in models, what regression results do communicate clearly is that lower TSA/BMAT performance of candidates from state schools is not an attribute of state schools, but rather is explained by prior attainment and socio-economic characteristics of candidates attending independent and state schools.

Consistently with results in Figures 2.2 and 2.5, regression models show that male candidates perform better than female candidates. Also, consistently with Figures 2.3 and 2.6, regression models indicate that BME candidates perform worse than White
applicants. The TSA/BMAT gap in performance between BME and White candidates is not explained by their prior attainment or socio-economic background. Thus there are other characteristics not included in regression models explaining the performance gap between BME and White candidates.

Regression results also show that early applicants perform better in TSA/BMAT admissions tests than those who apply later. The application time variable reflects days between 1st September and the application date, with smaller values indicating earlier applications. Bi-variate correlations with time of application are negative for both the TSA and BMAT results (Pearson’s r= -0.12), indicating that earlier applicants perform better in the test, consistently with regression results. Further analysis in this project will aim to explain the mechanisms for the positive effect of applying early on TSA/BMAT results.

### 2.5 Consistency checks

As the survey in Phase 2 was administered to on-course Oxford students only, consistency checks were performed to evaluate inconsistencies in regression findings for 1) all applicants and 2) on-course student pools. Regression analysis were rerun for on-course TSA (N=1,478) and BMAT (N=835) students only. Results are shown in Table 2.4.

**Table 2.4: Regression of TSA and BMAT scores on student and school characteristics, including on-course students only**

<table>
<thead>
<tr>
<th>Variables</th>
<th>TSA</th>
<th>BMAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.64</td>
<td>24.54</td>
</tr>
<tr>
<td>Gender (Female = 1)</td>
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<td>0.04</td>
</tr>
<tr>
<td>School type (Other = 1)</td>
<td>0.36</td>
<td>0.45</td>
</tr>
<tr>
<td>School type (State = 1)</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>BME (don't know/refuse =1)</td>
<td>0.10</td>
<td>0.14</td>
</tr>
<tr>
<td>BME (Yes = 1)</td>
<td>-0.22</td>
<td>0.05</td>
</tr>
<tr>
<td>ACORN Flag</td>
<td>-0.21</td>
<td>0.09</td>
</tr>
<tr>
<td>POLAR3 Flag</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Pre 16 School Flag</td>
<td>-0.04</td>
<td>0.09</td>
</tr>
<tr>
<td>Post 16 School Flag</td>
<td>-0.15</td>
<td>0.06</td>
</tr>
<tr>
<td>Overall WP Flag</td>
<td>-0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>Application time</td>
<td>0.22</td>
<td>0.36</td>
</tr>
<tr>
<td>GCSE A*s (z scored)</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>A-level A/A*s (z scored)</td>
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<td>0.05</td>
</tr>
<tr>
<td>School history of application</td>
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<td>0.02</td>
</tr>
<tr>
<td>UcasCycle</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>A-Level Art</td>
<td>-0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>A-Level Biology</td>
<td>-0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>A-Level Business Studies</td>
<td>0.22</td>
<td>0.20</td>
</tr>
<tr>
<td>A-Level Chemistry</td>
<td>0.04</td>
<td>0.08</td>
</tr>
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<td>A-Level Computing</td>
<td>0.59</td>
<td>0.53</td>
</tr>
<tr>
<td>A-Level Economics</td>
<td>0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>A-Level English</td>
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<td>0.18</td>
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<tr>
<td>A-Level English Language</td>
<td>-0.29</td>
<td>0.18</td>
</tr>
<tr>
<td>A-Level English Literature</td>
<td>0.00</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Further Mathematics</td>
<td>0.20</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Further Additional</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>A-Level Geography</td>
<td>-0.16</td>
<td>0.08</td>
</tr>
<tr>
<td>A-Level History</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Languages</td>
<td>-0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Law</td>
<td>-0.15</td>
<td>0.28</td>
</tr>
<tr>
<td>A-Level Mathematics</td>
<td>0.31</td>
<td>0.08</td>
</tr>
<tr>
<td>A-Level Other</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>A-Level Philosophy</td>
<td>0.05</td>
<td>0.10</td>
</tr>
<tr>
<td>A-Level Physics</td>
<td>0.12</td>
<td>0.08</td>
</tr>
<tr>
<td>A-Level Psychology</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>A-Level Religious Education</td>
<td>0.16</td>
<td>0.07</td>
</tr>
<tr>
<td>A-Level Science Other</td>
<td>0.18</td>
<td>0.43</td>
</tr>
<tr>
<td>A-Level Social Science</td>
<td>-0.33</td>
<td>0.19</td>
</tr>
</tbody>
</table>

p<0.05 (*), p<0.01 (**) and p<0.001 (***)

As expected a number of, but not all, the same characteristics were significant statistical predictors of TSA performance for on-course students only:

Significantly **lower performance** for,

- BME (relative to White) applicants
- Female applicants
- Acorn flagged applicants
- Post 16 school flagged applicants

Note, however, that the following characteristics are **no longer significant** based on the limited on-course pool:

- School type
- School history of Oxford applications
- Candidates who applied earlier
- Applicants with higher A-Level and GCSE scores

Also, a smaller number of A-Level courses are significant statistical predictors of TSA performance.

A-level courses associated with **higher performance**:
Further Mathematics, Mathematics, Religious Education

For BMAT, statistical predictors of performance for on-course students only are the following:

Significantly lower performance for,

- Female applicants
- Acorn flagged applicants
- Post 16 school flagged applicants
- Applicants with higher GCSE scores
- Applicants who applied in an earlier UCAS cycle

Note, however, that the following characteristics are no longer significant based on the limited on-course pool:

- BME applicants (relative to White applicants)
- Overall WP applicants (relative to non-flagged applicants)
- School history of Oxford applications
- Candidates who applied earlier
- Applicants with higher A-Level scores

Only Further Mathematics A-Levels is a significant statistical predictor of BMAT performance.

Students accepted to one of the University’s courses are a more selective and therefore heterogeneous group than the group of applicants in focus in Table 2.3. We can therefore assume that this is partly the reason why some characteristics are no longer predictive of test performance when looking at on-course students only, because their variance in the on-course student group is smaller. Hence, we see that, while school type, school history of Oxford applications, earlier application and higher A-Level and GCSE scores were statistically predictive of TSA test performance for the applicant group, these characteristics are no longer associated with test performance within the on-course student group. Within this group there is however still sufficient variance with regard to BME status, gender and socio-economic deprivation (ACORN Flag, post 16 school flag), for those characteristics to predict TSA test performance.

Similarly, for BMAT test scores, BME status, overall WP flag, the school’s history of Oxford applications, earlier application and higher A-Level scores applicants do not statistically predict test performance within the on-course student group, while they did within the applicant group. We can thus assume that the on-course students in Medicine and Biomedical science courses are more similar with regard to these characteristics and their related test scores. They are more heterogeneous, however, with regard to gender, indicators of socio-economic deprivation and GCSE scores, as these characteristics remain significantly related to BMAT test performance.
3. Analysis of Brasenose College survey data

First year students at Brasenose College were asked about their preparation for admissions tests in the context of a survey. Survey responses informed the preparation of interviews and, ultimately, the development of a survey administered to Oxford students in Phase 2 of this project.

Brasenose College provided a file with data for 141 respondents (47 in 2013, 44 in 2014, 50 in 2015), of which 116 indicated that they had sat an admissions test (38 in 2013, 37 in 2014, 41 in 2015).

They were asked to respond to the following open ended item:

‘If you had to take an aptitude test during the admissions process – could you say how you prepared, how much input your school had, and any other thoughts or recollections?’

The responses received for this item ranged from one or a few words to a good number of longer sentences. Most responses included information on the type and extent of preparation and the role of the school in preparation. Only a minority of responses also provided other thoughts and recollections. Table 3.1 presents an overview of results.

Students who responded to the survey were not identified as takers of a specific test (TSA, BMAT, other), hence responses may relate to any admissions test taken. However, survey responses could be grouped in the following thematic areas: amount of preparation, support from schools, use of exam preparation resources, and perceptions of the test. Selected quotes for each of these areas are presented in Appendix C. Main results are presented below.

**Table 3.1: Brasenose College: preparation and support by subject area**

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Total</th>
<th>% Prepared 'yes'</th>
<th>% Little or no support from school</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable responses</td>
<td>38</td>
<td>37</td>
<td>41*</td>
<td>116*</td>
<td>98*</td>
<td>84.4</td>
<td>51</td>
</tr>
<tr>
<td>Arts &amp; Humanities</td>
<td>12</td>
<td>17</td>
<td>12</td>
<td>41</td>
<td>29</td>
<td>70.7</td>
<td>20</td>
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<tr>
<td>Joint Degree</td>
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<td>4</td>
<td>1</td>
<td>12</td>
<td>10</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td>Sciences</td>
<td>9</td>
<td>10</td>
<td>15</td>
<td>34</td>
<td>32</td>
<td>94.1</td>
<td>14</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>10</td>
<td>6</td>
<td>7</td>
<td>23</td>
<td>20</td>
<td>87.0</td>
<td>13</td>
</tr>
</tbody>
</table>

* includes 6 respondents whose subject area is not clear; * includes 5 respondents whose subject area is not clear

### 3.1 Amount of preparation

Amongst the 116 respondents that had sat admissions tests there were very few who indicated they had not prepared for the test. The vast majority of students had prepared for the admissions test (84.4%), but the self-reported degree of preparation varied vastly, with 14 respondents indicating that they only had very limited preparation. The
reasons given for limited preparation varied from a lack of guidance on how to prepare to other priorities and unforeseen circumstances.

Most of the students who reported very limited test preparation were studying a subject in the Arts and Humanities (9), whereas only one Sciences student fell into this group. Overall, just over 70% of Arts and Humanities students explicitly indicated that they had undertaken substantial levels of test preparation, compared with nearly 85% of students overall (see Table 3.1).

3.2 Support from schools

Overall, 51 of 116 students indicated substantial support from their school in response to the item stated above, 25 indicated little or very little support and a further 26 explicitly made it clear that they had no help from their school, apart from the school providing some administrative support such as helping in registering for the test. In many cases, students who reported limited test preparation also indicated that they had no or very little support from their school. Support from schools was most wide-spread for students in the Social Sciences (see Table 3.1).

3.3 Use of exam preparation resources

Irrespective of whether students received support from their school, the most frequently mentioned type of preparation was working through past or practice papers. A clear majority of students made, often extensive, use of these papers (i.e., 70 students). In a good number of responses it becomes clear that students tried to substitute the lack of support from school by working extensively with past test papers.

Other material/sources mentioned included printed handbooks on admissions tests, the websites of test providers, online practice tests, subject-relevant textbooks, chat rooms, and sources made available on Oxford College or Department webpages.

3.4 Perceptions of the tests

In terms of the more general perceptions of the admissions test by students, a good number of respondents pointed to a significant level of uncertainty regarding what to expect in the test. This perception seems to be unrelated to the level of preparation students did, and in some ways developing a strategy for dealing with the feeling of uncertainty became part of the preparation process.

Students also described how this uncertainty was ‘resolved’, in as far as the actual tests turned out to be much harder than they had expected. However, there were some instances in which the experience of taking the test was described as enjoyable or rewarding, not least because they were different to what students had to prepare for A-Levels.
4. Interviews with Oxford students

To develop a survey for Phase 2, Brinkmann and Kvale’s (2015) seven stages of an interview process were used as a guide. Brasenose College survey responses (Section 3) informed the development of interviews with students at Oxford and in addition several themes emerged from the literature review and through discussions within the research team which guided the development of interview questions. Further, a pilot was conducted with three current Oxford University students at Brasenose College who had previously taken an Oxford University admissions test. The pilot together with results of the literature review and the Brasenose College survey pointed to six thematic areas. The themes are presented in Table 4.1. The themes together with more detailed prompts for follow-up questions were useful in maintaining the researchers’ focus during the interview process as they bridge the interview questions with the research aims. The wording of the questions was open aiming at evaluative and descriptive responses. The full interview guide is presented in Appendix D.

Table 4.1: Thematic Interview Guide

<table>
<thead>
<tr>
<th>Theme A</th>
<th>The Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme B</td>
<td>Preparation for the Test</td>
</tr>
<tr>
<td>Theme C</td>
<td>Usefulness of the Preparation</td>
</tr>
<tr>
<td>Theme D</td>
<td>Logistics Surrounding the Test</td>
</tr>
<tr>
<td>Theme E</td>
<td>Perceptions of the Relevance and Importance of the Test</td>
</tr>
<tr>
<td>Theme F</td>
<td>Advice for Future Students</td>
</tr>
</tbody>
</table>

These multiple perspectives were considered important for the development of a nuanced view of the findings (Flyvbjerg 2006). Participants were viewed as what Foley (2012) calls ‘a respondent’ as they were chosen because they have special knowledge around preparation for admissions tests and were thus positioned as experts. This reassured the participants that they were not being tested and ensured that the interview was more factual and descriptive rather than emotional (Foley 2012). The questions required participants to be reflective which was likely to lead to a variety of responses depending upon the participants’ openness and ability to articulate. Prior to meeting them, the researchers were not aware of the personality of the participant or how motivated they were to participate.

The aim of the interviews was to provide thick description and rich detail pertaining to preparation undertaken for Oxford University admissions tests. Ten students were selected for the main interview. The selection process was as follows. The sampling frame was the Definitive Dataset that contains information on all applicants who applied to Oxford in 2016 (to commence their studies in 2017). It was limited to those who met and accepted their offer and to courses that require taking an admissions test. It was important to achieve a good representation of all school types. A stratified random sampling was used to select 10 students from independent schools, 10 students
from state schools and 8 students from ‘other’ schools. In total 48 students were selected. Then the list was cross-checked with the list of current students to reveal that two of the chosen students did not commence their studies leaving 46 students in the sample.

The 46 students were invited by email to participate in the interview in two blocks, first twenty then twenty six, aiming at obtaining 10 positive responses. As the take up from the students was too low, it was necessary to approach another 44 students in order to summon 10 interviewees. These were selected in exactly the same way as the original sample of 46. The 10 students in the final interview sample received each a £10 incentive per interview. Table A4 (Appendix A) gives an overview of the characteristics of the invited sample and the 10 students who did the interview.

Interviews were conducted in a private room so that the conversation could be recorded confidentially and without interruption. Notes were taken of any reflections by the researchers to aid the formulation of follow-up questions. The interview schedules were semi-structured and were used as a guide with flexibility to explore other aspects. The researchers actively listened to what was said and how it was said so that it could be decided which aspects of an answer to pursue with secondary questions, being informed by knowledge of the topic and guided by empathy (Brinkmann & Kvale 2015). As Rubin and Rubin (2005) advise ‘you show empathy by asking questions to obtain the details that allow you to imagine what your interviewees have experienced’ (2005:81). The researchers were aware that participants would vary in the quality of data that they can provide and recognised that some may be reticent to share their honest views, so they attempted to ‘motivate and facilitate interviewee accounts’ through their tone and body language (Brinkmann & Kvale 2015:193). Data collection and some initial analysis occurred simultaneously so that judgements could be made about which secondary questions to ask. Interviews followed criteria for a quality interview provided by Brinkmann and Kvale’s (2015) and listed in Table 4.2.

Table 4.2: Brinkmann and Kvale’s (2015:181) criteria for a quality interview

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich, specific, and relevant answers from the interviewee</td>
<td></td>
</tr>
<tr>
<td>The shortest interviewer’s questions and longest subjects’ answers possible</td>
<td></td>
</tr>
<tr>
<td>The degree to which the interviewer follows up and clarifies the meanings of the relevant aspects of the answers</td>
<td></td>
</tr>
<tr>
<td>The degree to which the interviewer verifies their interpretations of the subject’s answers over the course of the interview</td>
<td></td>
</tr>
</tbody>
</table>

Qualitative analysis of the interview data contributed to devising a survey for Phase 2 of the project. The final survey questionnaire is presented in Appendix E.
5. Discussion of results from the exploration of relationship between student characteristics, test performance and test preparation (Phase 1)

The aim of this project is to study the impact of preparation for TSA and BMAT admissions tests using the case of Oxford. A number of research questions have been postulated. This section provides preliminary responses to the research questions with the datasets utilised in Phase 1.

Research questions

To what extent do students prepare for university admissions tests and what is the nature of this preparation amongst students with different background characteristics?

Results of the Brasenose College survey indicated that the great majority of students prepared for admissions tests (84%). The degree of preparation, however, varied remarkably across courses with students in the Arts and Humanities reporting limited test preparation compared to students in the Sciences. About half of the students indicated substantial support from schools, one quarter indicated very little support from schools, and another quarter indicated explicitly that they had no help from schools. Similarly, interviews with ten students indicated great variability in terms of school support, with students who had received regular and intense support from schools to students who had not received support at all. Very few students reported support from family and friends.

Beyond school support, students indicated making extensive use of past papers in preparing for admissions tests.

The Brasenose College survey is restricted to one College. The survey in Phase 2 examines further the preparation for admissions tests for students with different background characteristics.

What are the connections between student characteristics and test preparation and performance?

Results of Oxford admission datasets in 2010 – 2015 across different courses revealed connections between student characteristics and performance in the TSA and BMAT test.

Consistently, applicants with higher A-level and GCSE scores and applicants from schools with a history of applying to Oxford performed better in the TSA and BMAT test than the rest, even after controlling for a number of student and school characteristics.

BME and female applicants as well as applicants from deprived socio-economic areas performed worse in both tests, independently of other characteristics.
Candidates from independent schools performed better in the TSA and BMAT than candidates from state schools. However, candidates from State and independent schools with equivalent GCSE results performed fairly similar in admissions tests. That is, underperformance of state schools in admissions tests is mainly explained by prior attainment of candidates.

There is an interaction between the school type and GCSE performance, with candidates from independent schools performing slightly better than candidates from state schools at lower GCSE levels for the TSA test.

*Which prior qualifications and subjects are connected with test preparation and better test performance?*

Oxford admission datasets made it possible to look at the relationship between A-Level choices and performance in the TSA and BMAT tests. For both tests, specific A-Level choices such as Economics, Mathematics, Physics, and Religious Education related positively to performance in TSA and BMAT tests, whereas the Geography A-level was negatively related to performance in both tests even after student and school characteristics are taken into account.

*Is the time of application connected with preparation for, and better performance in, tests?*

Previous analysis (Section 2) had shown that early appliers were more likely to obtain an offer. This was true independently of the course, UCAS cycle, the applicant’s prior attainment, school type, and school history of applying to Oxford. The association with time of application was around one fifth as predictive as GCSEs for explaining offer decisions. Given this evidence, it was postulated that the time of application was associated with admissions tests results.

Evidence from Oxford admissions data indicate that early appliers perform better in the TSA and BMAT tests. The results hold even after a number of characteristics related to the applicant and his/her schools are taken into account. Different mechanisms may explain this result (e.g., preparation time, cultural capital, motivation). For example, it is possible that early appliers use more time for preparing for exams, or that early appliers and their families are better informed about the system, or even that early appliers are more motivated than late appliers. Analysis in Phase 2 with survey data explored some of the possible mechanisms underlying the association between time of application and admissions test scores.

*What amount, timing, and nature of preparation are connected with better test performance?*

This question is addressed in Phase 2 and results presented accordingly.

*Is the influence of test preparation on test performance mediated or moderated by student characteristics and background?*

This question is addressed in Phase 2 and results presented accordingly.
What learning strategies and sources of support are connected with positive test performance?

This question is addressed in Phase 2 and results presented accordingly.

Limitations

Likely the most important limitation of this study is that our data is restricted to on-course students at Oxford. As it is suggested by the Brasenose data, the majority of on-course students prepared for admissions tests (84%). However, we have no information on preparation for those candidates who were not offered a place. One could assume that the amount of preparation and preparation strategies varied for candidates admitted and not admitted to Oxford. In fact, variation between these two groups might be very valuable for identifying effective preparation strategies. To the extent that our analysis is limited to on-course students, our findings do not represent the whole range of performance in admissions tests and some effects might be underestimated. For example, the association with socio-economic deprivation will be underestimated if non-admitted candidates disproportionately more often come from socio-economically deprived areas.


6.1 Development of survey instrument on Oxford student test preparation and administration

The survey instrument has been developed on the basis of the findings from Phase 1 and in particular those of the qualitative interviews. It was administered to freshers who commenced their studies in October 2017. The questionnaire (Appendix E) asks a number of questions about how students have prepared for the admissions test. These include: how far in advance students started preparing for the test, the sources they used for test preparation and the support they received from various agents. In addition the survey included a scale on student learning strategies, widely used in the context of the PISA study (Marsh et al., 2006) and adapted for high-stakes tests in previous research by the Oxford University Centre for Educational Assessment (Baird et al., 2015).

The online survey was administered by Oxford University’s Student Data Management and Analysis team via Online Surveys (formerly BOS). The survey was open between 9th of March and 22nd of April 2018, in order to allow students sufficient time to respond between the end of Hilary and the beginning of Trinity Term.

Information collected through the survey was linked to respondents’ student admissions records which allowed for similar analysis to that undertaken for smaller samples of students in Phase 1, but employing much more detailed data on test preparation and more sophisticated methods.
6.2 Data

Table 6.1 gives an overview of the cohort and respondent information. In Michaelmas Term 2017 a total of 3,160 students commenced their undergraduate studies at Oxford University. Of these, 2,737 (86.6%) students needed to take an admissions test. 703 students took the TSA test and 181 took the BMAT test, that is, 22.2% and 5.7% of the total cohort, respectively.

Table 6.1: Overview of cohort and respondents

<table>
<thead>
<tr>
<th></th>
<th>Students commencing in MT 2017</th>
<th>Students taking admissions test</th>
<th>Students taking TSA</th>
<th>Students taking BMAT</th>
<th>Survey respondents</th>
<th>BMAT test takers</th>
<th>TSA test takers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>3160</td>
<td>2737</td>
<td>703</td>
<td>181</td>
<td>783</td>
<td>70</td>
<td>202</td>
</tr>
<tr>
<td>% of cohort</td>
<td>100.0</td>
<td>86.6</td>
<td>22.2</td>
<td>5.7</td>
<td>24.8</td>
<td>2.2</td>
<td>6.4</td>
</tr>
<tr>
<td>% of respondents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2.1 Response rates and analytical sample

783 students responded to the survey which constitutes 28.6% response rate, of which 202 (6.4% of the total cohort; 25.8% of respondents) are TSA test takers and 70 (2.2% of the total cohort; 8.9% of respondents) are BMAT test takers (Table 6.1). The response rate among TSA test takers was 28.7% and among BMAT test takers was 38.6%.

Of the 202 TSA test takers eight students did not indicate in the survey that they took the TSA test, although they were identified by the University’s admission information data as TSA test takers. Those students are excluded from the TSA sample as they might have answered questions in the survey in relation to another test. Table 6.2 gives an overview of the analytical sample.

Table 6.2: Overview of analytical sample

<table>
<thead>
<tr>
<th></th>
<th>Survey respondents</th>
<th>BMAT respondents</th>
<th>TSA respondents</th>
<th>Other test respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>783</td>
<td>70</td>
<td>194</td>
<td>519</td>
</tr>
<tr>
<td>% of respondents</td>
<td>100</td>
<td>8.9</td>
<td>24.8</td>
<td>66.3</td>
</tr>
</tbody>
</table>

6.2.2 Variables

A range of information has been collected through the questionnaire, not all of which can be reasonably addressed in the context of this report. Variables used for descriptive analysis are self-explanatory regarding their categories and are not listed below. For the multivariate analyses (sections 7.2 to 7.5) the following variables have been used:
• TSA test score: is the average of two separate marks from the Critical Thinking and Problem Solving tests, each weighted equally. The variable is continuous and has been standardised to have a mean of M=0 and a standard deviation of SD=1.
• BMAT test score: is a combined score from three BMAT test sections. For each section students receive a mark that is converted into a score. The combined total score weights sections 1 and 2 with 40% and section 3 with 20%. The variable is continuous with a range of 48 to 91 and has been standardised to have a mean of M=0 and a standard deviation of SD=1.
• Gender: is a binary variable indicating whether the student is female (0) or male (1);
• BME: is a binary variable indicating whether the student has a BME status (1) or not (0);
• Fee status: is represented by three dummy variables indicating whether the student has a Home, EU or non-EU fee status;
• School Group UK: is a binary variable indicating whether the student attended an independent (0) or state (1) school in the UK;
• School Group International: is a binary variable indicating whether the student attended a school in the UK (0) or an international school outside the UK (1);
• A-Level Band: indicates whether the student achieved ‘Less than A*A*B, A*AB or AAB’ (0), AAB (1), AAA (2), A*AB (3), A*AA (4), A*A*B (5), A*A*A* (6), 3A*s (7), 4A*s (8) or 5A*s or better (9). For the multivariate analysis the variable was standardised to have a mean of M=0 and a standard deviation of SD=1;
• Application time: is a continuous variable indicating the number of days that have lapsed between the students' application and the application deadline (15-OCT-2016). Larger values reflect earlier appliers;
• WPOVERALLFLAG (widening participation): is a dummy variable that indicates whether the applicant has obtained one or more of the school performance flags (pre or post 16) and one or more socio-economic flags (ACORN or POLAR3) or has previously been in care (1) or not (0);
• Time preparation: is a categorical variable indicating how much time in advance students started preparing for the test: 'not at all' (0), 'just before' (1), '1-2 months before' (2), '3-6 months before' (3), '6-12 months before' (4), 'More than a year before' (5). Note that this variable gives no indication of effort or degree of preparation in this time duration;
• Amount practiced: is a variable combining information from two questions: whether students practiced past papers and how much they practiced past test papers. The variable indicates that students ‘did not practice at all’ (0), ‘practiced very little or somewhat’ (1), ‘practiced quite a bit or a great deal’ (2);
• Online resources: is a binary variable indicating whether students overall used online resources ‘very little or somewhat’ (0) ‘quite a bit or a great deal’ (1) to
prepare for the test. The variable originally had four categories, but to ensure sufficient numbers on each category they were collapsed into two for multivariate analysis;

- Family support: is a binary variable indicating whether students received support from their family (1) or not (0);
- School encouragement: is a binary variable indicating whether a student’s school encouraged them to apply to Oxford (1) or not (0);
- Control strategies: is a scale indicating the extent to which students use control strategies to prepare for the test (M=0; SD=1; α=0.81110). It is based on five variables. Example item: ‘I tried to figure out which ideas I had not really understood’. Students answered all items by indicating how often they used a particular strategy on a 5-point Likert scale (always – never).
- Memorisation: is a scale indicating the extent to which students use memorisation strategies to prepare for the test (M=0; SD=1; α=0.916). It is based on four variables. Example item: ‘I tried to memorise as much of the revision material as possible’. Students answered all items by indicating how often they used a particular strategy on a 5-point Likert scale (always – never).
- Elaboration: is a scale indicating the extent to which students use memorisation strategies to prepare for the test (M=0; SD=1; α=0.792). It is based on four variables. Example item: ‘I tried to understand the revision material better by relating it to what I already knew’. Students answered all items by indicating how often they used a particular strategy on a 5-point Likert scale (always – never).

6.3 Description of the analytic sample and non-respondents

The sample comprised 58% females. The majority of respondents (84%) were White as opposed to BME. Three quarters of respondents were UK students (75%), 11% were from the EU and 13% were non-EU. There were 14% of respondents who had an Overall WP Flag11. There were 37% of respondents who came from independent schools (as opposed to state schools) and 23% of respondents came from overseas schools. Table A5 (Appendix) gives an overview of the samples statistics.

In order to check whether our sample of respondents is substantially different from the non-respondents a comparison of background characteristics was conducted. Figure 6.1 summarises the differences between the two groups.

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10 The Cronbach’s Alpha measures the internal consistency of the scale, α values higher than 0.8 are considered robust scales.
11 Students are flagged with the Overall WP Flag if they have at least one of school performance flag (pre-16 or post-16 flag) AND at least one socio-economic flag (ACORN or POLAR) OR if they were previously in care.
Chi-Square tests reveal that, apart from the percentage of students with BME status, all differences between the two groups are significant. Thus, the respondents are oversampled in the sense that significantly more female students, those from EU countries, those from state schools (UK only) and international schools and those with an Overall WP Flag have answered the questionnaire. In addition, respondents achieve significantly more often an A*AB A-Level score than non-respondents (not pictured).

There is no significant difference between the TSA test scores of Non-respondents (M = 68.6, SD = 6.13) and Respondents (M = 67.9, SD = 6.17; t (688) = 1.236, p = .0.746). Further, no significant difference between the BMAT test scores of Non-respondents (M = 64.09, SD = 6.72) and Respondents (M = 66.33, SD = 7.93; t (176) = -2.022, p = .263) was identified.


7.1 Descriptive analysis of the extent and nature of test preparation

7.1.1 Extent and nature of test preparation by test takers
This section looks only at the identified analytical sample (n=783) and distinguishes between TSA, BMAT and other test takers where appropriate.
The majority of students started preparing for the admissions test 1-2 months or more in advance of the test date (Figure 7.1). This is independent of whether they prepared for the TSA, BMAT or another admissions test. Only a small number of students indicated that they did not prepare at all for the test. TSA test takers start preparing for the test later (1-2 months before) than other test takers (including BMAT) who are more likely to start their preparations 3-6 months before the test date or even earlier. These differences are significant.

Figure 7.2 indicates that over 90% of test takers practiced past papers when preparing for the admissions test. Chi-Square tests reveal that other test takers are significantly less likely and TSA takers are significantly more likely to prepare for the test by practicing past papers. Moreover, BMAT takers prepare significantly more than TSA test takers (Figure 7.3).

There were further questions about how students practiced past papers. 77% indicated that they practiced under timed conditions, 35.2% indicated receiving feedback on the papers they practiced and 88.8% stated they used a mark scheme. Figure 7.4 provides further information about how useful students perceived these modes to be for their preparation.

**Figure 7.1: Time students start preparing for the admissions test**

![Bar chart showing the distribution of when students started preparing for the test.](chart.png)
Both practicing past papers under timed conditions and receiving feedback on them were perceived as extremely helpful in the preparation process by the majority of students who used those modes. The mark scheme was also mainly perceived as quite helpful. Only a small percentage of students (<15%) indicated that they did not perceive the different ways of practising past papers as helpful.

In order to prepare for the admissions test, students used online resources. Figure 7.5 displays the differences between overall use of online resources by test takers. Chi-Square significance tests reveal that BMAT test takers indicated they used online resources significantly more often than other test takers including TSA test takers. This
finding is however hardly surprising as more online resources are available for BMAT than for TSA.

Figure 7.4: Helpfulness of different modes to practice past papers

Figure 7.5: Overall use of online resources to prepare for the admissions test

The survey instrument also inquired in more detail about the types of online resources students used to prepare for the admissions tests. Overall most students used the Oxford University’s website, the official test provider websites and the Student Room in order to prepare for the admissions tests. They less often accessed other online resources such as You Tube or school/college websites. Figure 7.6 indicates that there
are substantial differences between the different test takers and their use of specific online resources. Chi-Square tests reveal the following significant differences: Other test takers are significantly more likely to use the Oxford University’s website and less likely to use an official test provider website. In contrast, BMAT test takers are significantly less likely to use the Oxford University’s website and more likely to use the official test provider website or other websites dedicated to the test. TSA test takers are also more likely to use the official test provider website but less likely to use other websites dedicated to the test.

The majority of students who used the Oxford University website, the official test provider website and other websites dedicated to the test perceived them as quite or extremely helpful (Figure 7.7). But, there are also substantial proportions of students who perceived the Oxford University website (29%), The Student Room (44%) and other websites dedicated to the test (19%) as not very helpful.

**Figure 7.6: Use of online resources to prepare for the admissions test**

![Bar chart showing usage of online resources by different test takers](chart)

**Figure 7.7: Perceived helpfulness of different online resources for admissions test preparation**
Students were further asked to provide information about support they received from their families in the process of preparing for the test. Only a few students received support from their families and the differences between the test takers are not significant (Figure 7.8). The majority of students who did receive support from their families indicated that this was financial support (13%), working out how to best approach the test (10%) going through past test papers (9%), revising subject-specific material (4%) and other forms of support (6%).

**Figure 7.8: Family support received**

With regard to support received from their schools, the majority of students indicated that they were already considering applying to Oxford and their schools encouraged
them (Figure 7.9). Only a few students indicated that their schools in fact discouraged them to apply. Similar proportions of students indicate that their schools supported them in preparing for the admissions test by providing opportunities to ask subject-specific questions or work with a subject teacher, providing workshops and mentoring. Schools less often provided the opportunity to use classroom periods to prepare for the test (Figure 7.10). Note that results for school support are not distinguished by test type because there is no reasonable assumption that school support should differ by the test that students take. Differences by student background characteristics are presented in section 7.1.2.

**Figure 7.9: School encouragement received**

<table>
<thead>
<tr>
<th>Did your school/college encourage you to apply to Oxford?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, they suggested I should consider applying</td>
</tr>
<tr>
<td>Yes, I was already considering it and they encouraged me</td>
</tr>
<tr>
<td>No, they did not</td>
</tr>
<tr>
<td>No, they actually discouraged me from applying</td>
</tr>
</tbody>
</table>

**Figure 7.10: School support received**

<table>
<thead>
<tr>
<th>Forms of school support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity to ask subject-specific questions or work with a subject teacher at your school/college</td>
</tr>
<tr>
<td>Provide workshops or classes to help prepare for the admissions test</td>
</tr>
<tr>
<td>General support/mentoring from a teacher at your school/college</td>
</tr>
<tr>
<td>Opportunity to use some class periods to prepare for the test</td>
</tr>
</tbody>
</table>

Students fell back on a range of other strategies and resources to prepare for the admissions test (Figure 7.11) such as studying the subject syllabus or textbooks, talking
Chi-Square tests reveal a number of significant differences between the test takers. Compared with students taking other entrance examinations in the dataset, BMAT and TSA test takers significantly more often used commercially published test preparation books to prepare for the test (which may not be available for all of the other tests); BMAT takers significantly more often attended commercial preparation courses and used the services of an external agency in order to prepare for the test; BMAT and other test takers used subject syllabus/textbooks significantly more often; other test takers talked to former pupils of their school or current/former Oxford students significantly more often and attended Oxford Open Days more often.

**Figure 7.11: Other strategies and resources used for preparation**

![Diagram showing strategies and resources used for preparation]

### 7.1.2 Extent and nature of test preparation by student background characteristics

This section looks at the identified analytical sample (n=783) and differentiates results by different student background characteristics. All descriptive analyses were conducted for the following background characteristics: Gender, BME status, Fee status, Overall WP Flag, School Group (UK only), School Group (International). However, only differences that are significant between different student groups are reported and discussed.

Figures 7.12 to 7.14 present the differences of when students start preparing for the admissions test by their characteristics. UK students were significantly less likely to report no preparation for the test than others, and non-EU students were significantly
more likely to report no preparation. Non-EU students were also significantly less likely to report that they started preparing 1-2 months before the test than others.

Significantly more students from UK state schools reported preparing just before the test than those from independent schools, and they were also significantly less likely to report preparing 3-6 or 6-12 months before the test than those from independent schools (Figure 7.13). Further, students from schools outside the UK significantly more often did not prepare for the test at all.

**Figure 7.12: Time students start preparing for the admissions test by fee status**

![Bar chart showing time students start preparing for the admissions test by fee status](image)

**Figure 7.13: Time students start preparing for the admissions test by School Type (UK only)**

![Bar chart showing time students start preparing for the admissions test by School Type (UK only)](image)
Almost all students practiced past test papers but female students (Figure 7.15), those with an Overall WP Flag (Figure 7.16) and those from International schools (Figure 7.17) practiced past test papers significantly less often than their counterparts.

With regard to the ways in which they practiced (mark scheme, feedback, timed conditions), significant differences are only found for students from independent schools who received feedback significantly more often (56.9%) compared to those in state schools (31.4%) and for students from UK schools overall (40.3%), compared to international schools (15.4%).

**Figure 7.15: Amount students practiced past papers by gender**

**Figure 7.16: Amount students practiced past papers by Overall WP Flag**
Figure 7.17: Amount students practiced past papers by School Group (International)

Figure 7.18: Overall use of online resources by School Type (International)
Significant differences in the overall use of online resources are found only for students from UK schools compared to students from international schools, where students from UK school indicated that they use online resources ‘very little’ significantly more often (Figure 7.18).

Differences in family support received are not significant between students from different background groups with one exception; students from international schools (39.4%) received significantly more support from their families than those from UK schools (29.6%). The difference is significant and is due to higher amounts of financial support (29%) that students from International schools receive compared to their peers from UK schools (8%).

Figure 7.19 presents the differences in school support by students from different UK schools. Only a relatively small percentage of students reported that their schools did not encourage them to apply (10%). But students from state schools indicated that they were less often encouraged to apply (12%) than students from independent schools (6%). They were also less often encouraged when they were considering it themselves than students from independent schools (63% vs. 74%). The differences are significant. This result prompts a closer look at the kind of support that independent school students receive compared to state school students.

**Figure 7.19 School encouragement by School Group (UK only)**

![Bar chart showing school encouragement by school group](chart.png)

Figure 7.20 and significance tests reveal that students in independent schools are offered significantly more opportunities to ask subject-specific questions or work with a subject teacher, receive general support/mentoring from a teacher and may prepare in workshops or classes for the admissions test than state school students.
Students from International schools (Figure 7.21) were also significantly less often encouraged to apply and less often encouraged when they were considering it themselves than students from UK schools.

Female students (27.3%) read commercially published test books significantly more often than male students (18.1%). BME students (39.6%) read commercially published test books significantly more often than non-BME students (20.5%). This may be attributable to a higher percentage of BME students taking the BMAT (36.1%) than the TSA (12.4%). BME students were also more likely to have attended commercial preparation courses (13.5% vs. 6.0%).

---

Figure 7.20 Forms of school support received by School Group (UK only)

<table>
<thead>
<tr>
<th>Service Provided</th>
<th>State</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity to ask subject-specific questions or work with a subject teacher at your school/college</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General support/mentoring from a teacher at your school/college</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity to use some class periods to prepare for the test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide workshops or classes to help prepare for the admissions test</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Figure 7.21: School support by School Type (International)
Students with an Overall WP Flag talked to former pupils at their school/college who took the test significantly less often than those without an Overall WP flag (8.3% vs. 19.7%) and WP students reported using other strategies more often (4.8% vs. 1.4%) (both differences are significant).

Students from independent schools talked to former pupils at their school/college who took the test significantly more often than those from state schools (32.3% vs. 11.0%), and also were more likely than state school students to have talked to current or former Oxford students who they knew (21.4% vs. 10.8%) (both significant) and to have attended Oxford Open Days (32.2% vs. 24.4%). Students from International schools used the services of an external agency significantly more often than those at UK schools (6.0% vs. 1.6%), and also talked to former pupils at their school/college who took an admissions test significantly less often (11.3% vs. 18.4%). Students from international schools also attended Oxford Open Days less often (6.0% vs. 27.9%) than those at school in the UK.

### 7.2 Associations between student background characteristics, test preparation and test performance

This sections looks at associations between student background characteristics, test preparation and test performance. Analyses are conducted for students of the analytical sample who took the TSA (n=194) and BMAT (n=70) test. Analyses are conducted separately for the two groups but coefficients are comparable because dependent variables (TSA test score and BMAT test score) have been standardised to have a mean of M=0 and a standard deviation of SD=1. Further, because samples are relatively small, particularly for the BMAT sample, a parsimonious approach to modelling is adopted, i.e. where independent variables are identified as non-significant predictors of test performance, they are excluded in the subsequent analysis.

In the first step regression analysis were conducted to predict test scores by the amount and nature of test preparation. Table 7.1 summarises the results. Models 1 to 5 for TSA and Models 7 to 11 for BMAT evaluate the relationship between each predictor with the test score individually. In Models 6 and 12 all variables were used together to predict the test score. For both tests, when students start preparing for the test is significant. Thus, the earlier the student starts preparing for the test the higher the test scores. The associations remain statistically significant when all other predictors are controlled for. Initially, the use of online resources is significantly related to BMAT test score, but when other predictors are controlled for, the association becomes insignificant. All other indicators of test preparation are not significantly related to test scores. Consequently, they are excluded from subsequent analysis.
Table 7.1: Regression coefficients for test performance on test preparation by test

<table>
<thead>
<tr>
<th></th>
<th>TSA test score</th>
<th></th>
<th></th>
<th>BMAT test score</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td>Model 4</td>
<td>Model 5</td>
<td>Model 6</td>
</tr>
<tr>
<td>fixed effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time preparation</td>
<td>0.173 (0.08) *</td>
<td>0.187 (0.14)</td>
<td></td>
<td></td>
<td></td>
<td>0.217 (0.09) *</td>
</tr>
<tr>
<td>Amount practiced</td>
<td></td>
<td>0.256 (0.15)</td>
<td></td>
<td></td>
<td>-0.009 (0.16)</td>
<td></td>
</tr>
<tr>
<td>Online resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.013 (0.17)</td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School encouragement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>random effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explained variance (in %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time preparation</td>
<td>0.423 (0.13) **</td>
<td>0.432 (0.24)</td>
<td></td>
<td></td>
<td>0.287 (0.15) *</td>
<td></td>
</tr>
<tr>
<td>Amount practiced</td>
<td></td>
<td></td>
<td>0.821 (0.28) **</td>
<td></td>
<td>0.233 (0.23)</td>
<td></td>
</tr>
<tr>
<td>Online resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.564 (0.32)</td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.007 (0.26)</td>
<td></td>
</tr>
<tr>
<td>School encouragement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.003 (0.26)</td>
<td></td>
</tr>
<tr>
<td>random effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explained variance (in %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17.30</td>
</tr>
</tbody>
</table>

p<0.05 (*), p<0.01 (**) and p<0.001 (***)
In a second step relationships between student background characteristics and test preparation with test scores were evaluated (Table 7.2). As in the previous table, Models 1 to 8 for TSA and Models 11 to 18 for BMAT evaluate the relationship between each predictor with the test score individually. Models 9 and 10 (TSA) and 19 and 20 (BMAT) combine a number of variables to predict the test score.

For the TSA test score, gender, Overall WP Flag and UK school group are significant predictors when looked at individually. Male students score higher while those with an Overall WP flag and those from state schools perform lower. When those predictors are evaluated in a multiple regression together with when students started preparing for the test and their overall use of online resources (Model 9), only the time when students started preparing for the test is significantly positively related to test score. The gender coefficient closely misses the significance level. Model 10 additionally evaluates the association between A-Level band and test scores, but this is not a significant predictor of TSA test scores when either looked at individually (Model 8) or when other variables are controlled for (Model 10).

Similarly, for the BMAT test scores, having an Overall WP Flag and having attended a state school are negatively associated with test performance when evaluated individually whereas overseas students perform better. Moreover, students with better A-Levels score significantly higher in the BMAT test. In the combined Model 19, students from state schools perform significantly lower than those from independent schools and female students perform significantly less well than male students. Test preparation variables are not significant once background characteristics are controlled for, i.e. characteristics that predict high performance in BMAT scores are out of students’ control. This means, in contrast to results for TSA, where preparing for the test earlier mitigated disadvantages from demographic characteristics, female and state school students still perform lower in BMAT despite having equal time preparing for the tests as male and independent school students. Model 20 additionally evaluates the association between prior attainment and test scores and this is significant, even when other variables are controlled for.

The variables in Table 7.2 explain 19.7% of test score variance for TSA, but 45.1% for BMAT. Thus, students’ background characteristics seem to be substantially more predictive of test scores for BMAT than for TSA. The amount of explained variance remains fairly constant when additionally controlling for A-Level band (23.2% TSA; 52.6% BMAT).

Note, although Fee status (OS) is initially significant, it could not be included in the combined model for computational reasons. In fact, students in the BMAT sample with an Overseas Fee Status are only n=3.

12 It should be noted that male students are underrepresented in the BMAT sample (20%) and that this may overestimate the gender effect.
Table 7.2: Regression coefficients for test performance on test preparation and student background characteristics and prior attainment by test

<table>
<thead>
<tr>
<th></th>
<th>TSA test score</th>
<th>BMAT test score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td><strong>fixed effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>0.428 (0.15)</td>
<td>**</td>
</tr>
<tr>
<td>BME</td>
<td>-0.25 (0.26)</td>
<td></td>
</tr>
<tr>
<td>Fee status (EU)</td>
<td></td>
<td>0.254 (0.21)</td>
</tr>
<tr>
<td>Fee status (OS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall WP Flag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School group UK (State)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School group INT (Intern.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-Level band</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>random effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explained variance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05 (*), p<0.01 (**) and p<0.001 (***)
7.3 Mediating and moderating effects of student background characteristics

In order to better understand the associations between student background characteristics, test preparation and test performance, mediation and moderation analysis is conducted. Mediation analysis is used to investigate whether the associations between test preparation and test performance are to some extent associations between student background characteristics and test performance because they are confounded with each other, i.e. that for example male students use online resources more often and because male students have on average higher test performance it looks like online resources are associated with test performance. Moderation analysis is used to investigate whether the association between test preparation and test performance varies by different student background characteristics, i.e. that for example the association between the time students start preparing in advance and test performance is differentially strong for students with or without an Overall WP Flag.

7.3.1 Mediating effects of student background characteristics for the association between test preparation and test performance

In the regression models student gender, having an Overall WP Flag, being from an independent or state school and prior attainment were at some point identified as significant predictors of test performance on TSA or BMAT. Thus this selection of background variables is used in the mediation analysis. Moreover, when students start preparing for the test and the overall use of online resources were identified as significant predictors of test performance. In addition, the amount of practicing past test papers is included, as the previous descriptive analysis revealed several significant differences on this variable between students of different background characteristics.

Figure 7.21 shows the general mediation model conducted separately for the four different background characteristics. For each background characteristic a separate mediation model was run both for TSA and BMAT test scores as dependent variables.

Neither of the selected student background variables significantly mediate any of the associations between the TSA test score and when students start preparing for the test, the amount they practice and their use of online resources. For BMAT, the only significant mediation effect was found between the use of online resources and gender. That is, the positive association between the use of online resources is substantially mediated by gender as the direct effect is in fact smaller than the indirect effect. Thus, male students overall achieve higher on the BMAT test and because they use online resources more often than females, it initially appears as if the use of online resources is positively related to test performance. However, a substantial amount of this association is confounded with the fact that male students generally attain higher scores in the test.
7.3.2 Moderating effects of student background characteristics for the association between test preparation and test performance

Again, the four student background characteristics (gender, Overall WP Flag, School Group UK, and prior attainment) and three test preparation variables (the time students start preparing in advance for the test, the overall use of online resources and the amount of practicing past test papers) were selected for the moderation analysis for the same reasons as outlined in section 7.2.1.

Figure 7.22 shows the general mediation model. Separate models were conducted for each of the four different background characteristics by each of the test preparation variables.

Figure 7.22: General mediation model to evaluate the association between test preparation and test performance
Neither TSA nor BMAT test score models show any significant moderating effects of students background characteristics on the relationship between test preparation variables and test score. That is, the relationships between test preparation and test scores are not significantly different for students of different categories on the background characteristics.

### 7.4 Associations between time of application, test preparation and test performance

This section evaluates whether the time elapsed between the students’ application and the application deadline (15-OCT-2016) is related to test preparation and performance. The variable reflects the difference between those two dates where larger values reflect an earlier application.

Table 7.3 summarises the results of the regression analyses of test performance on test preparation and application time. The time that elapsed between the application and the application deadline is not a significant predictor of test performance, either when evaluated separately or in relation with when students start preparing for the test and their use of online resources. While this is in line with the results for on-course students in Phase 1, it is worth remembering that application time was significantly associated with test scores in the sample of applicants, where earlier applicants scored higher in both tests.

### 7.5 Learning strategies and test performance

#### 7.5.1 The learning strategy scales

Students were asked a number of questions relating to the strategies they applied when preparing for the admissions test. Information on students’ learning strategies is widely used in the context of the PISA study (Marsh et al., 2006) in order to predict educational outcomes. The items used in this survey have been adapted for high-stakes tests in previous research by the Oxford University Centre for Educational Assessment (Baird et al., 2015). Overall, students provided information on 14 questions. Factor analysis was used to map the 14 items onto three scales identified by Marsh and colleagues (2006). These are: Control strategies, memorisation and elaboration. Table 7.4 gives an overview of items, factor and scale characteristics. With the exception of one, all items were successfully mapped onto the three scales accordingly.
Table 7.3: Regression coefficients for test performance on test preparation and application time by test

<table>
<thead>
<tr>
<th></th>
<th>TSA test score</th>
<th></th>
<th>BMAT test score</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>SE</td>
<td>Sig.</td>
<td>Model 2</td>
</tr>
<tr>
<td>fixed effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application time</td>
<td>-0.128 (0.65)</td>
<td></td>
<td></td>
<td>-0.371 (0.65)</td>
</tr>
<tr>
<td>Time preparation</td>
<td>0.162 (0.08)</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online resources</td>
<td>0.225 (0.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>random effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explained variance in %</td>
<td></td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

p<0.05 (*), p<0.01 (**) and p<0.001 (***)
### Table 7.4: Overview of items used for learning strategy scales and statistical information

<table>
<thead>
<tr>
<th>Variables</th>
<th>Scale</th>
<th>Eigenvalue</th>
<th>Explained Variance</th>
<th>Reliability (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I started by figuring out exactly what I needed to learn.</td>
<td>Control strategies</td>
<td>2.895</td>
<td>48.1</td>
<td>0.811</td>
</tr>
<tr>
<td>I checked if I understood what I had read.</td>
<td>Control strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I made sure that I remembered the most important points in the revision material</td>
<td>Control strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I did not understand something, I looked for additional information to clarify it.</td>
<td>Control strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to figure out which ideas I had not really understood.</td>
<td>Control strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to memorise all the material required</td>
<td>Memorisation</td>
<td>3.22</td>
<td>74.5</td>
<td>0.916</td>
</tr>
<tr>
<td>I tried to learn my notes by heart.</td>
<td>Memorisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to memorise as much of the revision material as possible</td>
<td>Memorisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to memorise what I thought was important.</td>
<td>Memorisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to relate new information to knowledge from other subjects.</td>
<td>Elaboration</td>
<td>2.469</td>
<td>49.7</td>
<td>0.792</td>
</tr>
<tr>
<td>I figured out how the information might be useful in the real world.</td>
<td>Elaboration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to understand the revision material better by relating it to what I already knew.</td>
<td>Elaboration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I studied material that went beyond what was expected for the test</td>
<td>Elaboration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 7.5.2 Associations between learning strategies, student background characteristics and test performance

Regression analysis was used to evaluate whether the three different learning strategy scales were associated with TSA and BMAT test scores. However, no significant results could be reported for either test. Nevertheless, a closer look at how different test takers and students with different background characteristics make use of learning strategies when preparing for the test revealed some significant differences. Specifically, students preparing for the BMAT test applied all three learning strategies – control strategies, memorisation and elaboration – more often than those preparing for the TSA. The same is true for BME students, although it is worth noting, that substantially more BMAT test takers are BME students (36.1%) than the TSA takers (12.4%). Further, female students
apply memorisation strategies more often than male students. Considering that both BMAT and TSA have major thinking skills components, this may not be the most suitable strategy and may potentially be related to the consistently lower test results for female students in the BMAT. In addition, students from schools outside the UK apply memorisation techniques less often.

Table 7.5: Descriptive statistics for learning strategies scale by test type and background variables

<table>
<thead>
<tr>
<th></th>
<th>Control strategies</th>
<th>Memorisation</th>
<th>Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>Sig.#</td>
</tr>
<tr>
<td><strong>Test types</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMAT</td>
<td>0.52</td>
<td>0.56</td>
<td>***</td>
</tr>
<tr>
<td>TSA</td>
<td>-0.19</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.07</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>-0.13</td>
<td>0.96</td>
<td></td>
</tr>
<tr>
<td><strong>BME status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-BME</td>
<td>-0.11</td>
<td>0.95</td>
<td>***</td>
</tr>
<tr>
<td>BME</td>
<td>0.48</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td><strong>Overall WP Flag</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>-0.02</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.18</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td><strong>School Group (UK)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>0.01</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>-0.01</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td><strong>School Group (International)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>0.00</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>-0.03</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

*Significance difference in between means is tested by T-tests for independent samples.

8. Discussion and limitations

The project aimed to evaluate the impact of test preparation for University admissions tests on test performance with data from Oxford University. The topic is of particular relevance because an increasing number of undergraduate programmes – nationally in the UK but also internationally - require applicants to take an admissions test. The outcomes of these tests are considered for admission to University in addition to prior school attainment measures such as GCSE scores. How students prepare for admissions tests and if this preparation has an impact on their performance in the test is however an under-researched area. Particularly, the project addressed the following overarching research questions:
- To what extent do students prepare for university admissions tests and what is the nature of this preparation amongst students with different background characteristics?
- What are the connections between student characteristics, including prior qualifications, and test preparation and performance?
- Is the time of application connected with preparation for, and better performance in, tests?
- What learning strategies are connected with better test performance?

In order to address these questions the first phase of the project explored the relationships between student characteristics and test performance with Oxford University Admissions data from 2010 to 2015. Drawing on information from the Brasenose College survey on how students prepare for admissions tests, findings from a literature review and qualitative interviews with a sample of students, a survey was developed. It asked for information on how far in advance students started preparing for the test, the sources they used for test preparation, the support they received from various agents and the strategies students employed to prepare for the test. The survey was administered to students who commenced their studies at Oxford University in October 2017.

Limitations

In considering the results, it is important to bear in mind some of the limitations of the research that may affect our interpretation of them.

Although it would have been valuable to be able to compare the preparation strategies between students who were accepted to their course and those who were not, this was not practically possible, and thus the survey sample was limited only to those who are current students.

These students thus represent a limited breadth of the entire applicant pool and hence a more homogeneous group, particularly in terms of their range of test results. It is also the case that some of the results might be underestimated (e.g. Overall WP Flag, BME status), and this may account for the lack of association seen in some areas, for example between test results and school history of applying.

It is also important to note that the survey is based on self-reported measures, and there may be some differences between groups in the way in which they represent themselves - for example females may be likely to be more reserved in their responses than males.

Nevertheless there are key findings from this project which are discussed below. These seem to be all the more important, because they are observed despite the smaller and more homogeneous group of on-course students assessed in this study.
Discussion of key findings

To what extent do students prepare for university admissions tests and what is the nature of this preparation amongst students with different background characteristics?

There is evidence that nearly all students prepare to take the test to some extent. Online resources were cited as frequently used by all students. While the most popular online source used was the Oxford University Website, students draw substantially on a number of other sources to prepare for the test, such as the official test provider website and The Student Room, with the majority of those who used them finding them to be quite or extremely helpful. Moreover, students used other strategies and resources to prepare for the test, such as reading commercially published test preparation books, subject/syllabus books, attending Oxford Open Days and talking to current Oxford students or former students who took the test.

All students prepare for the admissions test independent of their school type and socio-economic background. What is interesting though, is that the amount of support that students receive in order to prepare for the tests differs by those characteristics. Most notably, students from state schools and those with an Overall WP Flag seem to have the least access to support. They received feedback less often on the past test papers they practiced and were less likely to have talked to former pupils at their school/college or former or current Oxford students who took the test. It can be assumed that these forms of support are less readily available to them, rather than they are less likely to draw on them. In addition students from state schools are somewhat less likely to be encouraged to apply to Oxford and have fewer opportunities to prepare for the test in school contexts, such as teacher mentoring or school initiated workshops. Fewer opportunities to prepare and weaker support networks may also be the reason why state school students start preparing later for the test. This is the only variable relating to support that is significantly positively related to test performance when other preparation strategies are considered (both for TSA and BMAT) and when student background variables are controlled for (TSA only). This finding is in line with previous research that evidences the positive relationship between test preparation and test performance (e.g. Bangert-Drowns, Kulik, and Kulik 1983; Bunting and Mooney 2001; Messick and Jungeblut 1981; Powers 1986; Sturman 2003). However, as these results emerge in the group of on-course students only, it is reasonable to assume that the relative lack of preparation opportunities and support networks – through schools and former test takers – plays an even bigger role at an earlier stage in the selection process.

What are the connections between student characteristics, including prior qualifications, and test preparation and performance?

Unsurprisingly, A-Level results are related to test scores for the applicant pool. However, when looking at on-course students only who took the TSA no significant
relationship was found anymore. This means, A-Level results seem to be highly associated with TSA scores and hence of being admitted to a course. The on-course students then are a relatively homogeneous group in terms of A-Level results and test scores for which no significant relationship between A-Levels and test scores was found.

Within the group of on-course students who took the BMAT, A-Levels were still highly associated with test performance. It seems that a more heterogeneous group in terms of A-Levels (and possible test scores) has been accepted to courses that require the BMAT. Although not possible with the data at hand, it would have been interesting to evaluate whether they are in fact predictive of success in the courses themselves.

BME applicants, female applicants and those from deprived socio-economic areas performed less well in both the TSA and BMAT, other characteristics being equal, which consequently affects the chances of being accepted to a course. Within the group of on-course students the size of the effects of these characteristics has decreased, but largely remain to present as disadvantaging factors in TSA and BMAT performance. These results could only partly be confirmed with the more recent 2017/2018 student cohort, possibly due to the restricted sample. Here, female students, those from deprived socio-economic areas and from state schools performed less well on the TSA. However, when multiple background characteristics and test preparation strategies are taken into account, associations between gender, socio-economic areas and test performance are largely explained. It is also worth noting that for TSA, test preparation seems to counter the relative disadvantage associated with socio-economic deprivation, state school attendance and gender.

For BMAT, the picture looks slightly different. Students from deprived socio-economic areas, state schools and with lower A-Level results performed less well on the test. However, after accounting for multiple background characteristics and test preparation, being female, from a state school and having lower A-Level results remained significantly negatively associated with test performance. There is also evidence students’ background characteristics explain a larger variance of BMAT scores than TSA scores.

We did not find relevant evidence that student background variables mediate or moderate the associations between test preparation and test scores.

These results have implications for discussions around equity in admissions tests. Why do BME, female and applicants from socio-economically deprived areas underperform in TSA and BMAT despite equal GCSE and A-Level results? Similarly, why do students from state schools underperform in comparison to their peers at independent schools, despite GCSEs, A-Levels and other background characteristics being equal? With the data at hand we cannot answer these questions and there might be other characteristics not included in our analysis that are able to explain these gaps in test performance.
Is the time of application connected with preparation for, and better performance in, tests?

Results provide evidence that applicants who apply earlier perform higher on TSA and BMAT with other characteristics such as prior attainment, demographic and socio-economic characteristics being equal. However, for on-course students, it is the time students started preparing in advance for the test that positively predicts test performance in both TSA and BMAT, rather than the time of their application.

What learning strategies are connected with better test performance?

Results show that students preparing for the BMAT test applied the three learning strategies – control strategies, memorisation and elaboration – more frequently than students preparing for the TSA. Also, female students use memorisation strategies more often than male students. As both BMAT and TSA have major thinking skills components, memorisation may not be the best strategy and may potentially be related to the consistently lower test results for female students in BMAT.

Implications

There are practical implications of understanding these results. If preparation for admissions tests has a positive impact on test performance, clearly those with less opportunities and networks supporting preparation are at a disadvantage. Advantage can be gained from practice, and this needs to be communicated explicitly to those who will take the tests. It seems clear that more advantaged students are profiting from this knowledge already, and it is fair that this knowledge be shared.

There are practical forms of outreach that may be helpful, including developing clearer guidance around the efficacy of preparation, and the importance of starting such preparation well in advance of the admissions round. This should include advice that the attempt to memorise lots of information may not be the best strategy to prepare for admissions tests. There may also be consideration of how further ‘demystification’ of the admissions process to Oxford can be taken forward – clarifying both the timing and nature of the processes involved.

Moreover, previous research has shown that test preparation affects test specific skills rather than general intelligence or even general subject knowledge (Arendasy et al., 2016). Consequently, there may also be merit in reviewing the emphasis placed on tests in the admissions process, and whether they are putting already advantaged subgroups of students with more opportunities and support for preparation further ahead.
References


## Appendices

### Appendix A. TSA and BMAT tables

**Table A1. Average TSA standardised scores by CGSE quartiles and school type group (home applicants only)**

<table>
<thead>
<tr>
<th>School group</th>
<th>GCSE quartiles</th>
<th>Q1 (Sample size)</th>
<th>Q2 (Sample size)</th>
<th>Q3 (Sample size)</th>
<th>Q4 (Sample size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>Q1</td>
<td>-0.15 (410)</td>
<td>0.18 (838)</td>
<td>0.42 (1169)</td>
<td>0.61 (1396)</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Q1</td>
<td>-0.2 (123)</td>
<td>0.27 (52)</td>
<td>0.65 (30)</td>
<td>0.49 (26)</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Q1</td>
<td>-0.31 (1847)</td>
<td>0.13 (1520)</td>
<td>0.38 (1165)</td>
<td>0.6 (1031)</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td></td>
<td></td>
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</tbody>
</table>

Note: Sample size in parenthesis.

**Table A2. Average TSA standardised scores by CGSE quartiles and gender (home applicants only)**

<table>
<thead>
<tr>
<th>Gender</th>
<th>GCSE quartiles</th>
<th>Q1 (Sample size)</th>
<th>Q2 (Sample size)</th>
<th>Q3 (Sample size)</th>
<th>Q4 (Sample size)</th>
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</thead>
<tbody>
<tr>
<td>Female</td>
<td>Q1</td>
<td>-0.52 (847)</td>
<td>-0.03 (981)</td>
<td>0.19 (983)</td>
<td>0.42 (1110)</td>
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<tr>
<td>Male</td>
<td>Q1</td>
<td>-0.14 (1533)</td>
<td>0.27 (1429)</td>
<td>0.55 (1381)</td>
<td>0.75 (1343)</td>
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</tbody>
</table>

Note: Sample size in parenthesis.

**Table A3. Average TSA standardised scores by CGSE quartiles and BME background (home applicants only)**

<table>
<thead>
<tr>
<th>BME background</th>
<th>GCSE quartiles</th>
<th>Q1 (Sample size)</th>
<th>Q2 (Sample size)</th>
<th>Q3 (Sample size)</th>
<th>Q4 (Sample size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Q1</td>
<td>-0.14 (1616)</td>
<td>0.2 (1730)</td>
<td>0.48 (1668)</td>
<td>0.69 (1682)</td>
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<td>Not known/Refused</td>
<td>Q1</td>
<td>-0.28 (164)</td>
<td>0.25 (179)</td>
<td>0.22 (183)</td>
<td>0.48 (194)</td>
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<tr>
<td>BME</td>
<td>Q1</td>
<td>-0.65 (600)</td>
<td>-0.06 (501)</td>
<td>0.24 (513)</td>
<td>0.38 (577)</td>
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Note: Sample size in parenthesis
Table A4. Frequencies of background characteristics from the interview sample and analytical sample

<table>
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<th>Characteristics</th>
<th>Sample (46)</th>
<th>Analytical sample (10)</th>
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<td>N</td>
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<td>Subject study (detailed)</td>
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<td>Economics &amp; Management</td>
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<td>Engineering Science</td>
<td>4</td>
<td>8.7</td>
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<td>English</td>
<td>8</td>
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<td>English &amp; Mod Languages</td>
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<td>6.5</td>
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<tr>
<td>Experimental Psychology</td>
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<td>2.2</td>
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<td>4</td>
<td>8.7</td>
</tr>
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<td>Law</td>
<td>2</td>
<td>4.3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Medicine</td>
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<td>13</td>
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<td>Modern Languages</td>
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Table A5: Descriptive statistics of samples used in the analysis

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<th>Variables</th>
<th>Respondents</th>
<th>Non-Respondents</th>
<th>TSA</th>
<th>BMAT</th>
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</thead>
<tbody>
<tr>
<td>N</td>
<td>783</td>
<td>2,737</td>
<td>194</td>
<td>70</td>
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<td>Female Variables</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
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<td>80</td>
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<td>16.5</td>
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<td>36.1</td>
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<td>71.6</td>
<td>87.1</td>
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<td>8.6</td>
</tr>
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<td>10.4</td>
</tr>
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<td>AAA</td>
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<td></td>
<td>A*AB</td>
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<td>1.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A*AA</td>
<td>17.9</td>
<td>20.6</td>
<td>18.8</td>
</tr>
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<td></td>
<td>A<em>A</em>B</td>
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<td>1.1</td>
<td></td>
</tr>
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<td>A<em>A</em>A</td>
<td>22.9</td>
<td>26.0</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>3A*s</td>
<td>13.9</td>
<td>12.1</td>
<td>38.3</td>
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<td>4A*s</td>
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<td>28.7</td>
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<td></td>
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<td>1.2</td>
<td></td>
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<td>Practising past papers*</td>
<td>Practiced past papers</td>
<td>98.4</td>
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<tr>
<td></td>
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<td>88.4</td>
<td>88.2</td>
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</tr>
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<td>Received feedback</td>
<td>16.2</td>
<td>32.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practiced under timed conditions</td>
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<td>89.7</td>
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<tr>
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<td>32.9</td>
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<td>Official test provider website</td>
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<tr>
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<td>Other websites dedicated to the test</td>
<td>11.9</td>
<td>38.6</td>
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</tr>
<tr>
<td></td>
<td>Your school/college website</td>
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<td>4.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Another school/college website(s)</td>
<td>0.5</td>
<td>2.9</td>
<td></td>
</tr>
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<td></td>
<td>The Student Room</td>
<td>32</td>
<td>35.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other student forum websites</td>
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<td>4.3</td>
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<td></td>
<td>YouTube</td>
<td>4.1</td>
<td>10</td>
<td></td>
</tr>
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<td></td>
<td>Other</td>
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<td>7.1</td>
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</tr>
<tr>
<td>Family support*</td>
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<td>They discouraged</td>
<td>3.6</td>
<td>2.9</td>
<td></td>
</tr>
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<td>They did not encourage</td>
<td>19.7</td>
<td>21.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>They encouraged</td>
<td>58.0</td>
<td>57.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>They suggested</td>
<td>16.1</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide workshops/classes</td>
<td>30.6</td>
<td>42.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use class periods</td>
<td>1.6</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mentoring</td>
<td>21.2</td>
<td>24.3</td>
<td></td>
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<tr>
<td></td>
<td>Subject-specific questions</td>
<td>20.7</td>
<td>44.3</td>
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<td>Other strategies and resources used*</td>
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<td>34</td>
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</tr>
<tr>
<td></td>
<td>Commercial preparation courses</td>
<td>3.6</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Services of an external agency</td>
<td>0.5</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private tutorials</td>
<td>3.6</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subject syllabus/textbooks</td>
<td>5.2</td>
<td>65.7</td>
<td></td>
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<tr>
<td>Similarity</td>
<td>Respondents</td>
<td>Non-Respondents</td>
<td>TSA</td>
<td>BMAT</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>----------------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>7.7</td>
<td>22.9</td>
<td></td>
<td></td>
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<tr>
<td>9.8</td>
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<td>13.9</td>
<td>21.4</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Respondents</th>
<th>Non-Respondents</th>
<th>TSA</th>
<th>BMAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSA score (standardised)</td>
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<td>0.03</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>BMAT score (standardised)</td>
<td>0.19</td>
<td>-0.12</td>
<td>0.92</td>
<td>1.00</td>
</tr>
<tr>
<td>Time lapsed</td>
<td>13.05</td>
<td>52.61</td>
<td>6.39</td>
<td>6.14</td>
</tr>
<tr>
<td>Amount practicing past papers (0 'Very little' - 3 'A great deal')</td>
<td>3.08</td>
<td>0.87</td>
<td>3.36</td>
<td>0.85</td>
</tr>
<tr>
<td>Usefulness in ways of practising past papers (0 'Not at all helpful' - 3 'Extremely helpful')</td>
<td>1.95</td>
<td>0.83</td>
<td>2.26</td>
<td>0.84</td>
</tr>
<tr>
<td>Mark scheme</td>
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<td>0.71</td>
<td>2.32</td>
<td>0.68</td>
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<td>Feedback</td>
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<td>2.27</td>
<td>0.70</td>
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<td>2.69</td>
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<td>Overall use online resources (1 'Very little' - 4 'A great deal')</td>
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<td>1.06</td>
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<td>Oxford University website</td>
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<td>0.68</td>
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<td>Your school/college website</td>
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<td>0.33</td>
<td>0.58</td>
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<tr>
<td>Another school/college website(s)</td>
<td>0.00</td>
<td>1.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>The Student Room</td>
<td>0.68</td>
<td>0.57</td>
<td>0.52</td>
<td>0.59</td>
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<td>Other student forum websites (besides the Student Room)</td>
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<td>0.50</td>
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<td>YouTube</td>
<td>1.38</td>
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<td>0.86</td>
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<tr>
<td>Other</td>
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<td>0.60</td>
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<table>
<thead>
<tr>
<th>Learning strategies</th>
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<th></th>
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<td>0.97</td>
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<td>Memorisation strategies</td>
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<td>0.78</td>
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<tr>
<td>Elaboration strategies</td>
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<td>0.90</td>
<td>0.51</td>
<td>0.71</td>
</tr>
</tbody>
</table>

* Percentages relate to students who indicated that they used this particular strategy, resource or received a particular support.
### Appendix B

**Table A6: Regression results for combined BMAT test scores (Medicine and Biomedical Sciences) and BMAT test scores for Medicine only**

<table>
<thead>
<tr>
<th>Variables</th>
<th>BMAT</th>
<th></th>
<th>BMAT - Medicine only</th>
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<tr>
<td></td>
<td>Coef.</td>
<td>SE</td>
<td>Sig.</td>
<td>Coef.</td>
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<td>Intercept</td>
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<td>11.03</td>
<td>***</td>
<td>-64.09</td>
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<td>Gender (Female = 1)</td>
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<td>0.02</td>
<td>***</td>
<td>-0.23</td>
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<td>School type (Other = 1)</td>
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<td></td>
<td>0.41</td>
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<tr>
<td>School type (State = 1)</td>
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<td>0.02</td>
<td></td>
<td>-0.04</td>
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<tr>
<td>BME (don't know/refuse =1)</td>
<td>-0.29</td>
<td>0.05</td>
<td>**</td>
<td>-0.31</td>
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<tr>
<td>BME (Yes = 1)</td>
<td>-0.27</td>
<td>0.02</td>
<td>***</td>
<td>-0.28</td>
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<tr>
<td>ACORN Flag</td>
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<td>0.04</td>
<td>**</td>
<td>-0.11</td>
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<tr>
<td>POLAR3 Flag</td>
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<td>0.03</td>
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<td>0.00</td>
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<td>0.03</td>
<td></td>
<td>-0.03</td>
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<tr>
<td>Post 16 School Flag</td>
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<td>-0.03</td>
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<td>Overall WP Flag</td>
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<td>***</td>
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<td>A-level A/A’s (z scored)</td>
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<td>0.01</td>
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<td>UcasCycle</td>
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<td>0.01</td>
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<td>A-Level Economics</td>
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<tr>
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<td></td>
<td>-0.01</td>
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<td>0.03</td>
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<td>-0.05</td>
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<td>***</td>
<td>0.11</td>
</tr>
<tr>
<td>A-Level Other</td>
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<td>A-Level Philosophy</td>
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<td>A-Level Physics</td>
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<td>**</td>
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<td>A-Level Psychology</td>
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<td>A-Level Social Science</td>
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<td></td>
<td>-0.16</td>
</tr>
</tbody>
</table>

p<0.05 (*), p<0.01 (**) and p<0.001 (***)
Appendix C. Brasenose College survey: selected quotes

B1. Amount of preparation

'I sat an aptitude test but didn't really do anything in the way of preparation because I knew it would be on topics I hadn't encountered before and would be looking to assess my more general skills as a historian, that I couldn't really revise' (Arts & Humanities, 2014).

B.2 Support from schools

'Took the TSA. School had zero input' (Social Science, 2013).

'I had to take the BMAT, my school didn’t have a lot of input in my preparation’ (Sciences, 2014).

‘... my school held classes once a week going over them (past test papers) for a couple of months before (the test was taken)' (Sciences, 2014).

'My school gave several half hour meetings to discuss general ways of approaching the ... test’ (Arts & Humanities, 2014).

'Had to take the TSA – had a couple of sessions at school and prepared using the past papers/question books' (Social Sciences, 2013).

‘... our teacher gave us a powerpoint slide detailing the types of questions that might arise and how best to logically go about answering them’ (Joint Degree, 2015).

‘prepared by doing the past papers, school has some (not very useful) classes on it’ (Arts and Humanities, 2015).

'My school gave me some classes in advance but these were of little use’ (Arts & Humanities, 2015).

'School held workshops but were not useful’ (Sciences, 2015).

‘My schools was very supportive but couldn’t do too much to help’ (Social Sciences, 2013).

'School had no input because they didn’t really understand what it was…’ (Arts & Humanities, 2014).

‘... they (school teachers) weren’t quite sure exactly how best to help all the time as they were unfamiliar with the system (Sciences, 2014).

'I was very lucky because my school prepared me well for the test, I did a lot of practice tests and my teacher was willing to mark them and talk me through some feedback' (Arts & Humanities, 2015).

‘... a couple of meetings with a maths teacher at my school helped me to go through them (practice maths questions)’ (Science, 2013).
‘I did past papers and had feedback from a history teacher (... who) told me where I was going wrong and how I could improve (Arts & Humanities, 2014).

‘Prepared quite a lot for the MAT. School put on twice weekly lunchtime extensions in preparation. By the time of taking the test had completed all of the past paper questions available on the website’ (Science, 2014).

‘I wrote out every past HAT test and my school marked my essays and gave me feedback’ (Arts & Humanities, 2014).

‘Did all the past papers, my school held classes once a week going over them for a couple of months before’ (Science, 2014).

B.3 Use of exam preparation resources

‘My school had very little input beyond administering the TSA. I prepared just by doing as many past papers as I could find’ (Social Sciences, 2013).

‘I did all of the available practice tests, but received no assistance from my school’ (Social Sciences, 2013).

‘I bought the grammar book that students here use (I was advised in Blackwells) and I went through it, making notes’ (Arts & Humanities, 2013).

‘I was given very little guidance by my school so resorted to asking students I knew had studied at Oxford about the best way to prepare’ (Arts & Humanities, 2013).

‘My school did not organise much to help me, however, a former Oxford undergrad who now works at my school gave me a few pointers on what to look for’ (Arts & Humanities, 2013).

‘I mainly prepared by revising my GCSE science course’ (Sciences, 2014).

‘I did the HAT so I just printed off every past paper and made sure that I knew my A level history syllabus so I could draw upon pre-existing knowledge’ (Arts & Humanities, 2013).

‘... over the half term holiday I ensured I had a sound knowledge of my AS topics’ (Joint Degree, 2013).

‘My school provided me with all grammar textbooks I need for my German test’ (Joint Degree, 2013).

‘As I do Modern Languages, I also generally revised grammar’ (Arts & Humanities, 2013).

‘... the content (of the PAT) was far removed from the AS syllabus’ (Science, 2013).

B.4 Perceptions of the tests

‘... was quite intimidating, and had little idea about what I was about to sit’ (Social Sciences, 2013).
‘Didn’t really know what to expect from it (the test). Would have liked more guidance...’ (Arts & Humanities, 2013).

‘Would have liked more guidance, especially on to how it featured in the admissions process’ (Arts & Humanities, 2013).

‘It was stressful with different rumours about how much weighting the result had on admission prospects...’ (Sciences, 2014).

‘The test were much harder than anything I had prepared for’ (Arts & Humanities, 2013).

‘I remember the test being very challenging – harder than the mock tests – but very interesting at the same time’ (Arts & Humanities, 2014).

‘The test was more enjoyable than expected’ (Joint Degree, 2014).

‘I really enjoyed sitting it strangely’ (Arts & Humanities, 2014).

‘The tests were tough but I think rewarding and necessary’ (Sciences, 2013).

‘The paper itself was unique and challenging, and a test in hindsight I probably enjoyed’ (Sciences, 2015).

‘Test was challenging but enjoyable having the opportunity to write something entirely different to A-levels’ (Arts & Humanities, 2015).
Appendix D. Interview guide

**Information and Consent**

One of the aims of this research project is to learn how students prepare for Oxford admissions tests. We are interested to know about the experiences that you had so that it can inform us about the connection between test preparation and admissions outcomes which we hope will contribute to developing effective support for future applicants.

You are invited to take part in an interview lasting around 45 minutes. The interview will be audio recorded and the transcription will be sent to you for verification before we analyse it. The information you provide will be kept strictly confidential and your answers will be aggregated with those of other participants so that you remain anonymous. The information you provide will be used for the purposes of research and student advice only.

The research is led by Dr Daniel Caro from the Department of Education, University of Oxford. Should you have any questions please contact him (daniel.caro@education.ox.ac.uk).

For questions regarding the ethical approval process please contact the head of Department of Education Research Ethics Committee, Dr Liam Gearon (liam.gearon@education.ox.ac.uk).

Please confirm that,

- you have read and understood the information about this study.
- you understand that you can withdraw from the study without consequence at any time simply by informing the researcher.
- you are aware of who to contact should you have questions following my participation in this study.
- you understand that this project has been reviewed by and received ethical clearance through the University of Oxford Central University Research Ethics Committee.
- you agree to participate in this study.

Name (Interviewee): __________________________________________
Date: __________________________________________
Signature: __________________________________________

Researcher (Interviewer): ______________________________
Date: __________________________________________
Signature: __________________________________________
You
Q. Which course do/did you study and when did you start?

Q. Which test did you take as part of the admissions process and when was that?

Preparation for the test
Q. When did you find out that that test was part of the admissions process?
   o Where and from whom?
   o Were you clear about what was involved in the test?

Q. Who would you say helped you to understand what the test was about and what preparations you would need to make? Were they experts/experienced?
   o How did each person help?
   o How much did you figure-out for yourself?

Usefulness of Preparation
Q. Did you prepare for the test?

Q. If so, what did you do?
   o Organize your study space
   o Use flow charts and diagrams
   o Practice past exam papers
   o Explain your answers to others
   o Organize study groups with friends

Q. Which approaches were most useful to you and which were less so?

Q. Which materials did you find to be the most useful and which were less so?
   o Past Papers
   o Preparation books
   o Preparation courses
   o Oxford website
   o Test provider website
   o Subject syllabus

Q. Were your preparations useful for the test or was it different to what you expected?

Q. Was the format easy to understand, do and complete on time?

Logistics surrounding the test
Q. Did you register for the test yourself?
   o Did anyone else help with that?

Q. Did you have to pay a fee to take the test?
- Was it manageable?

Q. Where was the test and how easy was it to get there?

Q. What was it like taking the test in that venue?

**Perceptions of Importance of and Relevance of the test**

Q. When you were preparing to apply, how important did you think the test was in getting you a place at Oxford?

Q. Was the test referred to later in the admissions process?

Q. What would your advice be for students who will take the test next year?
Appendix E: Survey Instrument

Test preparation strategies questionnaire

Introduction
Thank you for taking this survey. The results will help us develop more effective support for future applicants.
Information you provide will be kept strictly confidential and will remain anonymous.
The survey should take no more than 15 minutes.

Information about the test

Which test(s) did you have to take?

- Biomedical Admissions Test (BMAT)
- Classics Admissions Test (CAT)
- English Literature Admissions Test (ELAT)
- History Aptitude Test (HAT)
- Physics Aptitude Test (PAT)
- Law National Aptitude Test (LNAT)
- Modern Languages Admissions Test (MLAT)
- Oriental Languages Aptitude Test (OLAT)
- Philosophy Test (for the joint course of Philosophy and Theology)
- Thinking Skills Assessment (TSA)
- Other

If you selected Other, please specify.

How did you find out that you needed to take the test as part of the admissions process?

- I saw it on the Oxford Admissions website
- At the Open Days at the University of Oxford
- At an Oxford Student Conference or other outreach event
- It was stated on the UCAS form
- My school/college teacher or administrator told me
- My parents told me
- Teachers from another school/college told me
- I was told by an external agency

1 / 43
☐ Other

If you selected Other, please specify:

☐ More than 2 years before the application deadline
☐ 1-2 years before the application deadline
☐ 3-6 months before the application deadline
☐ Just before the application deadline
☐ I don't remember

How did you register for the test?

☐ My school/college registered me
☐ I registered myself - I had to fill in a form
☐ An external agency registered for me
☐ I don't remember

Did you pay any administration fees relating to the test?

☐ Yes
☐ No

☐ Don't remember
☐ Not applicable

If Yes, please rate the cost of the fees?

☐ Very expensive
☐ Expensive
☐ About right
☐ Cheap
☐ Very cheap
Test preparation

When did you start preparing for the test?
- More than a year before the test
- 9-12 months before the test
- 3-6 months before the test
- 1-2 months before the test
- Just before the test
- I did not prepare at all
- I don’t remember

Did you have a sense of how well you had to do in the test in order to be invited for an interview?
- Yes
- No
- I don’t remember

How helpful was knowing how well you need to do in the test?
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful
### Practising past papers

**How much did you practise past papers?**
- A great deal
- Quite a bit
- Somewhat
- Very little

**How helpful did you find practising past papers?**
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

**Did you have a mark scheme for them?**
- Yes
- No
- I don't remember
- Not applicable

**How helpful was the mark scheme?**
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

**Did you receive any feedback on your past papers answers or did anyone mark them for you?**
- Yes
- No
- I don't remember

**Who did this for you?**

**How helpful was the feedback/ marking?**
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

**Did you practise the test under timed conditions (i.e. did you do them within the time constraints allowed on the test day)?**
- Yes
- No
- I don't remember

**How many practice tests did you time in this way?**

---

7 / 40

---

8 / 40

---
- All of them
- Most of them
- Some of them
- A few of them
- I don't remember

How helpful was it to practise under timed conditions?
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

What do you think you gained from practising past papers? (Please tick all that apply)
- Familiarity with the test questions
- Familiarity with the test format
- Familiarity with the subject knowledge needed for the test
- Learning how to answer the test questions
- Learning to take the test within the time limit
- Other

If you selected Other, please specify:

Please use this space to tell us anything else you'd like to say about past papers.
Online resources

Please tick all the online resources you used when preparing for the test:

- Oxford University website
- Official test provider website
- Other websites dedicated to the test
- Your school/college website
- Another school/college website(s)
- The Student Room
- Other student forum websites (besides the Student Room)
- YouTube
- Other

If you selected Other, please specify:


How much did you use the official test provider website when preparing for the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful did you find the official test provider website when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did you use any other websites dedicated to the test when preparing for the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful did you find these other websites when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did you use your school/college website when preparing for the test?

- A great deal
How helpful did you find your school/college website when preparing for the test?
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did you use another school/college website(s) when preparing for the test?
- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful did you find those other school/college website(s) when preparing for the test?
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did you use the Student Room website when preparing for the test?
- A great deal
- Quite a bit
- Somewhat
- Very little

Which other student forum websites (besides Student Room) did you use when preparing for the test?

How much did you use YouTube when preparing for the test?
How helpful did you find YouTube when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Please state briefly what YouTube content you used when preparing for the test:

[Blank space for response]

How much did you use any other online resources when preparing for the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful did you find these other online resources when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Overall, how much did you use online resources when preparing for the test? *Required*

- A great deal
- Quite a bit
- Somewhat
- Very little
- Not applicable
Overall, please rate how helpful you found online resources when preparing for the test

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Please use this space if you would like to tell us more about using online resources when preparing for the test.

School/college support

Would you say that many students from your school/college apply to Oxford or Cambridge every year?

- Yes
- No
- I don’t know
- Not applicable

Did your school/college encourage you to apply to Oxford?

- Yes, they suggested I should consider applying
- Yes, I was already considering it and they encouraged me
- No, they did not
- No, they actually discouraged me from applying
- Not applicable

Did your school/college provide any workshops or classes to help you prepare for the admissions test?

- Yes
- No
- I don’t remember
- Not applicable

Were they a part of the normal timetable?

- Yes
Please rate how helpful it was to be given some time during class periods to prepare for the test.

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Did you receive any general support/mentoring from a teacher at your school/college when preparing for the test?

- Yes
- No
- I don't remember
- Not applicable

How often did you meet with this teacher while preparing for the test?

- Once a month
- Once a fortnight
- Once a week
- More than once a week
- Other

If you selected Other, please specify:

How helpful did you find these general support/mentoring meetings with your teacher?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Did you have an opportunity to ask subject-specific questions or work with a subject teacher at your school/college when preparing for the test?

- Yes
- No
- I don't remember
- Not applicable

How often did you have an opportunity to get a subject-specific support from a subject teacher at your school/college when preparing for the test?

- More than once a week
- Once a week
- Once a fortnight
- Once a month
- Other

If you selected Other, please specify:

How helpful did you find this subject-specific support when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful
Did the teachers who helped you have any recent experience of preparing students for taking Oxford admissions test?

- Yes, they have helped students at my school/college before
- No
- I don't know
- Not applicable

Did your school/college help you with any other aspects of the Oxford admission process? Tick all that apply.

- UCAS form
- Personal statement
- Mock interviews
- Application writing
- None of the above
- Other

If you selected Other, please specify:

[Blank space]

Please use this space to tell us anything else you'd like to say about your school/college supporting you when preparing for the test.
Family support

Did you receive any support from your family members when preparing for the test?

- Yes
- No
- Not applicable

What support did you receive from family members when preparing for the test? Tick all that apply.

- Helping me to work out how to best approach the test
- Going through past papers with me
- Helping me revise subject-specific material
- Financial support
- Other

If you selected Other, please specify:

[ ]

How much did they help you with working out how to best approach the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful was their involvement in working out how to approach the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much were they involved in going through past papers with you?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful was their involvement in going through past papers?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did they help you with revising subject-specific material for the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful was their involvement in revising subject-specific material when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful
How much financial support did you receive from your family members when preparing for the test?
- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful was the financial support you received?
- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Which family members helped you when preparing for the test? Tick all that apply.
- One or more of my grandparents
- One or more of my parents/careers
- One or more of my brothers/sisters
- One or more of other family members (e.g., uncle, cousin)

Please use this space to tell us more about family members who supported you when preparing for the test, or write N/A:

Other strategies and resources
What other strategies and resources did you use when preparing for the test? Tick all that apply:
- I read commercially published test preparation book(s)
- I attended commercial preparation course(s)
- I used services of an external agency
- I had private tutorials
- I used study syllabus/teachbooks
- I talked to former pupils at my school/college who took an admission test
- I talked to current or former Oxford students who know
- I attended Oxford Open Days
- Other
- None of the above

If you selected Other, please specify:

How much did you read commercially published test preparation book(s)?
- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful were these books?
- Extremely helpful
- Quite helpful
- Not very helpful

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How helpful was talking to former pupils at your school/college who took an admission test
when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How much did you talk to current or former Oxford students when preparing for the test?

- A great deal
- Quite a bit
- Somewhat
- Very little

How helpful was talking to current or former Oxford students when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

How helpful were Oxford Open Days when preparing for the test?

- Extremely helpful
- Quite helpful
- Not very helpful
- Not at all helpful

Please use this space if you would like to tell us more about other strategies and resources
Taking the test

Did you take the test in a place that was familiar to you (e.g., at your school/college)?
- [ ] Yes
- [ ] No

Do you think that taking the test in an unfamiliar place affected your performance?
- [ ] Yes, I think I performed better
- [ ] Yes, I think I performed less well
- [ ] No

Please explain why:

Did you travel far (more than 10 miles/50 km) to take the test?
- [ ] Yes
- [ ] No
- [ ] Not applicable

Please give more details:

Did you have to stay away overnight?

How well prepared did you feel to take the test on the day?
- [ ] Very well prepared
- [ ] Well prepared
- [ ] Somewhat prepared
- [ ] Not at all prepared

Was the test in line with your expectations?
- [ ] It was exactly as I expected
- [ ] It was more or less as I expected
- [ ] It was somewhat different from what I expected
- [ ] It was completely different from what I expected

Please give more details:
How would you describe the amount of time allowed to complete the test?

- I completed the test and had plenty of time left
- I completed the test and had some time left
- I just completed the test within the time allowed
- I did not quite complete the test
- I was nowhere near completing the test

Please use this space if you would like to tell us more about your experience of taking the test on the day.

The test as a part of the admission process

Did anyone mention the admissions test at your interview?

- Yes
- No
- I don't remember
- Not applicable

How important do you think the test was in the admission process as a whole?

- Very important
- Important
- Moderately important
- Slightly important
- Not important
- I don't know
Your advice for prospective students

What one piece of advice would you want to give prospective students about Oxford admissions tests?

About you

When did you first think about applying to Oxford?

- More than 3 years before I applied
- Around 3 years before I applied
- Around 2 years before I applied
- Around a year before I applied
- 6-12 months before I applied
- 3-6 months before I applied
- Less than 3 months before I applied
- Other

If you selected Other, please specify:

Have any of your family members studied at Oxford?

- Yes
- No

Please state which family members. Tick all that apply.

- One or more of my grandparents
- One or more of my parents/cousins
- One or more of my brothers/sisters
- One or more of other family members (e.g. uncle, cousin)
Was there any expectation in your family that you should apply to Oxford?

- Yes
- No
- Not applicable

Is there anything that Oxford University could do differently to improve your experience of the admissions tests?

Is there anything that Oxford University could do differently to improve your overall experience of the admissions process?

Please use this space if you have any further comments about the admissions test or the admissions process as a whole:
Learning strategies

The following two sets of questions are different from the previous ones because they come from established surveys. Your answers are important for us to investigate how learning strategies and perceptions of the test are related to how well students did on the test.

Below are some learning strategies you might have used when preparing for the test. Please state how often you used the following strategies.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Always</th>
<th>Often</th>
<th>Now and then</th>
<th>Almost never</th>
<th>Never/Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tried to memorise all the material required</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I started by figuring out exactly what I needed to learn</td>
<td></td>
<td></td>
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<tr>
<td>I tried to relate new information to knowledge from other subjects</td>
<td></td>
<td></td>
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<tr>
<td>I checked if I understood what I had read</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I tried to learn my notes by heart</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>I chose not to study some topics as I thought they would not come up</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I figured out how the information might be useful in the real world</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I tried to understand the revision material better by relating it to what I already knew</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I made sure that I remembered the most important points in the revision material</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>If I did not understand something, I looked for additional information to clarify it</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I tried to memorise as much of the revision material as possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| I tried to figure out which ideas I had not really understood.           |        |       |              |              |                      |
| I tried to memorise what I thought was important.                       |        |       |              |              |                      |
| I studied material that went beyond what was expected for the test      |        |       |              |              |                      |

- **Strongly disagree** - 1
- **Disagree** - 2
- **Agree** - 3
- **Strongly agree** - 4

| I think I will be able to use what I learned from this test in the future |        |       |              |              |                      |
| To do well in the test I needed to think and adopt what I knew           |        |       |              |              |                      |
| The test examined the right kind of learning                             |        |       |              |              |                      |
| To do well in this test, I needed a broad understanding of the subject, across many topics |        |       |              |              |                      |
| To do well in this test, remembering was more important than understanding |        |       |              |              |                      |
| I predicted the test questions well                                      |        |       |              |              |                      |
| I felt I knew what the examiners wanted                                  |        |       |              |              |                      |
| I was surprised by the questions on the test                            |        |       |              |              |                      |
| I could do well in this test even if I did not fully understand the topics |        |       |              |              |                      |
| I felt a lot of topics out of my revision and still thought I would do well |        |       |              |              |                      |
Thank you

Thank you very much for taking the time to complete this survey. Your responses have now been logged.