



A Taxonomy of A-Level Subjects According to the Expressed Preferences of Russell Group Universities: Who Does What?

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Abstract

While the proportions of young people in England progressing to university have increased considerably over the last fifty years, those from the least privileged backgrounds remain under-represented at highly selective universities. The biggest barrier to participation remains low attainment, but other factors may also be important. One postulated factor is the role of A-level subject choice, with the Russell Group of large, research intensive, highly selective universities seeking to address a lack of information held by students at age 16+ by publishing a list of subjects which it describes as facilitating of university entry. Their list covers a minority of the A-level subjects available to English students in 2014/15, and the extent to which the remaining subjects are facilitating or not of entry is unclear. In this work I develop a taxonomy of all 96 A-level subjects available in 2014/15, based on the published preferences of Russell Group universities, and go on to describe the differences in take-up of these subjects by gender and school type. Using recently linked National Pupil Database and Higher Education Statistics Agency data I then apply the taxonomy to three recent cohorts of university entrants, giving prima facie evidence of variations in proportions of subjects from different categories held by Russell Group and non-Russell Group entrants, and map these categories onto previous work on subject difficulty. The taxonomy provides a useful starting point for the analysis of the role of subject choice in university application, is informative in the context of current A-level reforms and draws attention to subjects taken by significant numbers of Russell Group students that are not available at many state schools and colleges.

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INTRODUCTION

The number of young people in England going to university has increased dramatically over the last fifty years, but there remains considerable concern about the under representation of young people from less privileged backgrounds to university generally, and to highly selective universities in particular (Anders, 2012; Chowdry, Crawford, Dearden, Goodman, & Vignoles, 2013; Sullivan, Parsons, Wiggins, Heath, & Green, 2014). The main barrier to highly selective universities has been shown to be lower attainment at school (Anders, 2012; Chowdry et al., 2013; Macmillan, Crawford, & Vignoles, 2014; Marcenaro-Gutierrez, Galindo-Rueda, & Vignoles, 2007) but even after attainment is taken into account some effect of socio-economic status (SES) on entry to high status university remains. This suggests that other factors may be also be important, and there has been increasing interest recently in the role of the qualifications held by applicants, and in particular their choices of subject. Most English 18 year old entrants to highly selective¹ British universities apply on the basis of predicted or actual A-levels: 77% of those accepted in 2014 hold ABB or better in A-levels compared with 2% with corresponding grades in BTEC (UCAS, 2014). But within those applicants offering A-levels a bewildering number of choices are possible: in 2014/15 96 different A-levels were available for teaching in England. The actual choices faced by students are more restricted but still considerable; typically schools and further education colleges offer 20 -30 different subjects, and sixth form colleges 30 - 50.

Working out which are the 'optimal' A-level subjects in the context of admission to university is not straightforward, either for individuals or schools. There is a lack of centralised information about the efficacy for access to highly selective universities of all of the 96 separately certified A-levels. For some years commentators have suggested a lack of transparency by universities about the A-levels they do not consider acceptable (often described as 'soft' as opposed to 'hard') and described a lack of coherent guidance available to students as they choose subjects (Fazackerley & Chant, 2008; Grimston & Waite, 2008; Morrison, 2013). In order to provide better information to 16 year olds making subject choice decisions, the Russell Group (RG) of universities² has since 2011 published annual guidance entitled 'Informed Choices' on A-level subjects it considers helpful for admission to its member institutions (Russell Group, 2015) . It introduced the idea of facilitating

¹ UCAS classifies UK higher education providers as high, medium or low tariff, based on the mean attainment of a common group of accepted applicants. Each group accounts for around one third of acceptances at higher education providers.

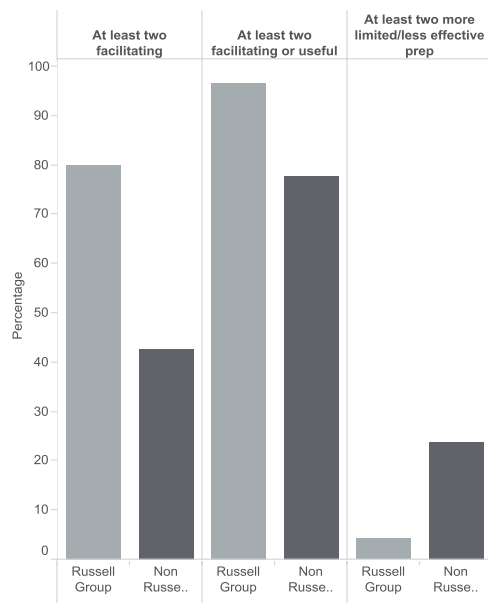
² A group of 24 large, highly selective, research intensive universities. They are Birmingham, Bristol, Cambridge, Cardiff, Durham, Edinburgh, Exeter, Glasgow, Imperial, King's, Leeds, Liverpool, LSE, Manchester, Newcastle, Nottingham, Oxford, Queen Mary London, Queen's Belfast, Sheffield, Southampton, UCL, Warwick, York.

subjects³, being those which keep the widest number of degree courses at Russell Group universities open to applicants. This is important given that students choose subjects at age 16+ that commit them to a course of study at least a year before they make a university application. For the many students who will not have decided on a degree course at age 16, choosing facilitating subjects may minimise constraints when they come to make their application. There is some evidence that choosing facilitating subjects (with the exception of English literature and with the addition of economics in one study) increases the chances of entry to highly selective universities (Boliver, 2013; Chowdry et al., 2013), but any differences in the efficacy of the 63 non-facilitating subjects remains unexplored.

In this paper I contribute to the pool of evidence that can be drawn on by those advising students by developing a taxonomy of all 96 subjects by expressed suitability for admission to highly selective universities, so going further than the dichotomous classification of facilitating/ not facilitating. I use Russell Group membership as a proxy for high selectivity. I re-classify the 63 'non-facilitating' subjects into four further categories, based on guidance from 'Informed Choices' and an examination of specific A-level requirements published by the 24 Russell Group universities. These four further categories are 'useful', 'more limited suitability', 'less effective preparation' and 'non-counting' in the context of highly selective university entry. Figure 1 is based on linked National Pupil Database (NPD) and Higher Education Statistics Agency (HESA) data for all students entering UK universities between 2010 and 2012 from English mainstream schools and colleges (including private schools) who have taken at least three A-levels. It suggests significant differences in proportions of those taking subjects from these categories between those attending Russell Group and non-Russell Group institutions. Almost twice as many Russell Group students hold at least two facilitating subjects as non-Russell Group, and there are nearly six times as many non-Russell Group as Russell Group students with at least two 'more limited suitability'/'less effective preparation' subjects.

³ Mathematics, further mathematics, pure mathematics, English literature, physics, biology, chemistry, geography, history, languages (classical and modern) – 33 separate subjects in total.

Figure 1: Percentage of students holding A-level subjects of different categories, by university type



The development of a taxonomy of A-levels provides a protocol that I will use in future work examining the role of subject choice at A-level in admission to university and the relationship between subject choice and student characteristics. It can also be used by others to assess whether the facilitating subject performance indicator is a policy tool likely to achieve the objective of increasing the proportion of young people from less privileged backgrounds entering highly selective universities, and can inform current policy work on the reform of A-levels.

Subject choice has recently become a focus of Government attention. In an attempt to reduce the differential attendance rates between private and state school pupils at high status universities, and noting the large difference of uptake in facilitating subjects between private and state schools, the Coalition Government in 2011/12 introduced the achievement of AAB in two facilitating subjects⁴ as a Social Mobility Indicator (Office of the Deputy Prime Minister, 2013)⁵, as well as a school level performance indicator to be published annually by all schools and sixth form colleges.

In this paper I describe the A-level system and its regulatory framework in England. I review the literature on categories of A-level choice and university entry and describe my classification methodology. I give descriptive statistics of A-levels taken according to this classification, split between private and state schools and by gender, according to recent National Pupil Database data. I provide prima facie

⁴ The original indicator was for AAB in three facilitating subjects, subsequently changed.

⁵ The indicators aim to measure short-term factors that are likely to predict long-term social mobility.

evidence of efficacy of categories for highly selective university entry by reporting proportions of A-levels held by students at UK universities, using recently available linked NPD HESA data, and map the categories onto previous work on the relative difficulty of A-level subjects.

THE A-LEVEL SYSTEM AND ITS REGULATORY FRAMEWORK

A-LEVELS

The precursors of A-levels are seen in the 'Local' examinations set by London, Oxford and Cambridge universities from the mid-19th Century. These examinations were taken by students at their schools (hence 'local') as part of the selection process to university. A-levels to be taken by students leaving school aged 18+ were introduced in 1951, following the Norwood Report of 1943 on the whole school examination system. They replaced Higher School Certificate whose main subject syllabuses became the first A-level subjects, with the important distinction that A-levels were awarded in individual subjects, rather than in groups. The School Certificate and Higher School Certificate system had been finally rolled out by 1917, following the 1902 Education Act. A-levels have come to perform a dual role of providing both a summative assessment of the attainment of students leaving secondary education at 18+, and a predictive function as the most important element of selection into university for the majority of applicants (UCAS, 2014).

The number of different A-level subjects has grown to reflect the differing needs of the larger cohorts of students now taking A-levels (House of Commons Select Committee Education and Skills, 2003), but as the number of options has grown, so has the perception that not all A-levels are equally acceptable to universities, and in particular to the most selective universities. There is recent renewed involvement by universities in advising the Department for Education on A-level content.

A-levels are graded from A* to E, with the A* being awarded for the first time in 2010 in response to the criticism that the existing grade structure did not discriminate enough at the top end.

'Curriculum 2000' was a Government initiative reforming the structure and content of the post 16 academic examination system (House of Commons Select Committee Education and Skills, 2003). It introduced AS (Advanced Supplementary) Levels, first examined in 2001. These count for half the points of an A-level. The aim of the reform was to broaden the subject range taken by year 12 students (age 16+), who in general take four subjects at AS Level, then continue with three of them to A-level. Typically AS examinations are taken at the end of year 12 within a modular system, then the additional modules required to make up the full A-level in those subjects

with which the student wishes to continue are taken in year 13, although this system is currently being reformed. AS levels are graded from A to E.

APPLIED A-LEVELS

These are part of the A-level system, and are in more vocational subjects than other A-levels, although in some cases have similar content to non-applied A-levels (for example both A-level business and A-level applied business exist). Of the ten different applied A-level subjects, seven exist in both single award and double award form. They are graded from A* to E for the single award, and A*A* through to EE for the double award. They were introduced for teaching from September 2005, replacing the suite of Advanced Vocational Certificates of Education (AVCE) which were withdrawn from teaching in 2004. These AVCEs were short-lived qualifications; they were created in September 2000 to replace the Advanced GNVQ (General National Vocational Qualification), with the main change being that AVCEs were graded as A-levels (A* to E) rather than the Distinction, Merit, Pass grading of Advanced GNVQs. The suite of applied A-levels is therefore badged and graded like non-applied A-levels, but aimed at students with a more vocational bent. These, too, are proving short-lived; none of them will be retained under the reform of A-levels discussed below.

REGULATION AND EXAMINATION BOARDS

In 2014/15 there were 96 A-levels available to students in England excluding pilots and including applied A-levels. They are regulated by the Office of Qualifications and Examinations Regulation (Ofqual), and provided by four examination boards⁶. Most subjects are provided by more than one examination board, and there is more than one specification available within examination boards for several subjects. Schools and colleges can choose to teach specifications from different exam boards.

Table 1: Numbers of subjects available for teaching in England by examination board

Examination board	Number of A-level specifications available 2014/15	Number of different A-level subjects available 2014/15⁷
AQA	69	58
OCR	67	52 ⁸

⁶ The fifth A-level examination board regulated by Ofqual, CCEA (Council for the Curriculum Examinations and Assessment) offers A-levels taken only in Northern Ireland.

⁷ Ofqual includes separate listings for the four design and technology pathways for AQA, whereas for OCR (2 pathways), Edexcel (2 pathways) and WJEC (3 pathways) there is just one 'design and technology' A-level on the regulated list. The pathways are included separately on Department for Education statistics and are certified separately.

Edexcel	54	42
WJEC	39	37

REFORMS TO A AND AS LEVELS

Following the Coalition Government’s 2010 White Paper ‘The Importance of Teaching’, in 2012 the Secretary of State for Education set out a plan for the reform of A-levels in England, covering their design, regulation, assessment and content, and in particular requiring that universities be more involved in the design of A-levels to ensure that they provide effective preparation for university study. This was followed by consultations by Ofqual on design, regulation and assessment (Ofqual, 2013), and by the Department for Education (DfE) on content (Department for Education, 2013). Ofqual and DfE took advice from the A-level Content Advisory Board (ALCAB), a body reporting to the Russell Group of Universities and funded by the DfE, with the remit to advise on the content of A-levels considered particularly important in preparation for undergraduate study at leading universities, namely the ‘facilitating subjects’ group. Reformed A-levels were introduced for first teaching in 2015, starting with five facilitating subjects and others taken by large numbers of candidates⁹. The second phase of reformed subjects will be introduced for first teaching in September 2016¹⁰. The introduction of reformed A-levels in the remaining facilitating subjects (Maths and Further Maths) has been postponed until 2017, along with 14 other subjects¹¹ where the results of subject content and assessment consultations are awaited as at October 2015 (Department for Education, 2015a, 2015c). Consultation on three other non-language subjects¹² has not yet taken place.

Part of Ofqual’s process of reform was the discontinuing of A-levels done by very few students, where there is similar or overlapping content with other A-levels, or where the content requirements do not meet Ofqual’s principles for reform (Ofqual, 2014a). All 17 applied A-levels will be discontinued from 2017 or before, as well as 13 other A-levels¹³ currently available to students in England (Department for Education,

⁸ There is one entry for ‘classics’ on the Ofqual list, although four additional pathways exist within the OCR regulated classics specification which are certified separately and are included separately in Department for Education statistics. Only OCR provides classics and its pathways.

⁹ English language, English literature, English language and literature, biology, chemistry, physics, history, psychology, art and design, sociology, business, economics, computer science.

¹⁰ Ancient languages (classical Greek and latin), modern foreign languages (French, German, Spanish), dance, drama and theatre, geography, music, physical education, religious studies.

¹¹ Accounting, ancient history, archaeology, classical civilisation, design and technology, electronics, environmental science, film studies, history of art, law, media studies, music technology, philosophy, statistics.

¹² Geology, government and politics, information and communication technology

¹³ Anthropology, citizenship studies, communication and culture, creative writing, critical thinking, economics and business, general studies, human biology, humanities, performance studies, pure mathematics, science in society and world development.

2015a, 2015c; Ofqual, 2015). The future of all community language A-levels (modern languages other than French, German and Spanish) is not yet resolved, with the period allowed for reform extended to 2018 (Department for Education, 2015b). Most of the A-levels to be discontinued come from the 'less effective preparation' category of the taxonomy, which is unsurprising given the renewed emphasis on A-levels as preparation for university study.

The changes to structure and assessment include the removal of January exams from January 2014 onwards, and the linear examination of A-levels at the end of the two year course rather than their being examined at AS level at the end of the first year and A2 level at the end of the second year (or in January sittings in some cases). AS and A-levels will be 'decoupled' so that only AS examinations are taken at the end of the first year, and A-levels examined entirely in the second year (Ofqual, 2014b).

GUIDANCE FROM RUSSELL GROUP UNIVERSITIES

'Informed Choices' was published in response to the perceived need for better information for year 11 students, and in its earliest edition (Russell Group, 2011) included examples of 'soft' subjects¹⁴, since removed (Russell Group, 2015). It discusses 76 A-level subjects either individually, or as members of a group, remaining silent on 20. 33 subjects (counting all modern and classical languages separately) are classified as facilitating. It suggests that these are the subjects most often required for courses at Russell Group universities, and that the more that are chosen, the more degree course options remain open. It recommends that at least two such subjects should be taken by students who have not yet made up their minds about what course to do at university, although notes that there are other subjects providing good preparation for university study but which are required for too few courses to be put on the facilitating list¹⁵. 23 subjects are described as either essential or useful for particular courses, but without conferring the broader options benefits of the facilitating group, and some subjects are specifically warned against as not providing good preparation for entry to a Russell Group university - general studies, critical thinking, citizenship and all 17 'applied' subjects. Even for students who refer to 'Informed Choices' in year 11 this leaves 23 subjects of uncertain status, and it would not necessarily be clear to students which A-levels are 'applied'; eight of the separately certified applied A-levels have the word 'applied' in their name, but nine do not.

Five Russell Group universities publish lists of acceptable or not acceptable A-levels (LSE, 2014; The University of Edinburgh, 2014; The University of Sheffield, 2014;

¹⁴ Media studies, art and design, photography (an endorsement of the art and design A-level) and business studies were listed.

¹⁵ Economics, religious studies and Welsh (first and second language) are included as examples of such subjects.

UCL, 2014; University of Cambridge, 2013), and their lists suggest that many of these 'uncertain status' subjects are considered 'less effective preparation' for university study, and students should take no more than one of them. In some cases guidance conflicts; some subjects appear on 'not acceptable' lists but are considered useful for particular courses at other Russell Group universities. In other cases guidance is counter-intuitive for a student making choices at 16+; for example the LSE makes clear that even for admission to related degree courses such as accounting and finance, A-levels in accountancy, business studies and law are considered unhelpful. Rowbottom (2013) finds in a qualitative survey of accounting undergraduates at a Russell Group university that state school students are unaware that some subjects might be considered 'less effective preparation' subjects when they make their applications.

CLASSIFICATION METHODOLOGY

I create new categories for the 63 non-facilitating subjects. These categories have been determined and A-levels classified based on the analysis of the following sources of information; the Russell Group of Universities annual publication 'Informed Choices' (Russell Group, 2013), DfE guidance on facilitating subjects for the AAB Key Stage 5 Performance Table Indicator (Department for Education, 2014), the general admissions webpages of the 24 Russell Group universities, and the webpages detailing specific course requirements for a range of Russell Group degree courses. In developing this taxonomy, no judgements about the worth of the subjects are being made, apart from their published acceptability to this particular group of universities.

The five universities publishing general guidance on the acceptability or otherwise of A-levels at university level, as well as for individual courses, do so in different ways. Edinburgh and Sheffield publish complete lists of A-levels split between approved/not approved (The University of Edinburgh, 2014) and acceptable/acceptable only in combination (The University of Sheffield, 2014); the LSE publishes a list of non-preferred subjects (LSE, 2014)¹⁶; UCL has a list of acceptable A-levels (UCL, 2014) and Cambridge has a document discussing required and helpful A-levels which says that those it does not mention are either too specialised and not a good choice for keeping options open, or are not good preparation for Cambridge courses (University of Cambridge, 2013). 41 subjects appear non-preferred by reference to one or more of these lists, in addition to critical thinking and general studies, discussed below. Most of these universities suggest that no more than two A-levels are taken from these lists.

¹⁶ In 2015 LSE started also publishing a list of preferred subjects. These changes do not alter the A-level classifications in the Taxonomy.

Reviewing these sources suggests that some A-levels are perceived as particularly helpful for Russell Group university entry. A second set of subjects is considered generally useful, and no general reservations about them are expressed in the sources. A third set is considered useful for particular degree courses, but at least some Russell Group universities have reservations about the general usefulness of these subjects. There is then a group of subjects where at least some Russell Group universities have reservations, and no related degree courses describe the subjects as useful preparation. Finally, there are two subjects which are frequently mentioned as not counting towards the three A-levels generally required for Russell Group courses. From this review, a list of categories was devised as follows:

- Facilitating
- Useful
- More limited suitability
- Less effective preparation
- Non-counting

A flowchart of the process by which the A-levels were assigned to categories is given in Appendix 1.

FACILITATING

These are the A-level subjects identified in 'Informed Choices'. 20 are modern languages and three are classical languages (Latin, classical Greek, biblical Hebrew). Four are science subjects (biology, human biology, chemistry, physics), three are mathematics (further mathematics, mathematics, pure mathematics) and the remainder are English literature, geography and history.

USEFUL

It is assumed that where subjects do not appear on any of the non-preferred lists or do appear on all the approved lists as appropriate that they may be classified as useful for Russell Group university entry. 20 non-facilitating subjects are therefore described as useful.

MORE LIMITED SUITABILITY

Although at least one of the five universities above has reservations about 41 subjects, in many cases it appears these subjects are useful for particular degree courses at some Russell Group universities. In addition to the facilitating list, 'Informed Choices' lists 'essential' and 'useful' subjects for the 61 most popular university degree course groups. Of the 41 subjects where there are reservations, the 24 non-applied subjects were all checked to these popular degree course lists to see whether they are described as useful for particular course choices (for example, art and design is useful for architecture, but 'non-preferred' by LSE and Sheffield). Because the list of 61 university course groups in Informed Choices is not

exhaustive, these 24 subjects were also checked against entry requirements on Russell Group degree course websites to see if the subjects are ever described as essential, useful, preferred or acceptable. The UCAS course search tool¹⁷ was used to find courses at Russell Group universities in subject areas for which the A-level might be useful or essential¹⁸. The search terms by A-level are given in Appendix 2.

14 of these subjects (counting design and technology certifications separately) were described as essential, alternative required, preferred or useful for particular courses either in the ‘Informed Choices’ degree course lists or on Russell Group websites for related degree courses, and were therefore classified as ‘more limited suitability’¹⁹; they are useful for specific degree subject courses but there are reservations at one or more Russell Group universities as to their general usefulness for university admission. This is a cautious approach to their classification; designed to flag up the possibility that even one of the five Russell Group universities publishing overall lists might not consider a subject good preparation for its courses.

LESS EFFECTIVE PREPARATION

Those A-levels included on non-preferred lists or omitted from approved lists that are not described as essential, alternative required, preferred or useful for any of the Informed Choices list of subjects or on the websites of related individual Russell Group courses are categorised as ‘less effective preparation’. There are 10 non-applied such subjects, and 17 applied A-levels, discussed below. As with the ‘more limited suitability’ group, it is a cautious classification, where expressed reservations by only one Russell Group university result in its inclusion, if it is not useful for related courses. Seven of the 10 non-applied subjects will be discontinued under current reforms.

The phrase ‘less effective preparation’ was used by Cambridge University of a list of 20 subjects published in 2006 (Vidal Rodeiro, 2007). Cambridge has now withdrawn this ‘negative’ list and replaced it with the positive list reviewed for this study, but the phrase remains in the literature and is a useful encapsulation of the idea that whilst these A-levels are worthwhile in their own right, they may be less effective in facilitating entry to a Russell Group university.

Applied A-levels

The third edition of ‘Informed Choices’ suggests that applicants with a double applied A-level award will need “very high grades indeed plus a high grade in an extra A-level to be considered by most Russell Group universities” (Russell Group, 2013, p.

¹⁷ Search.ucas.com, accessed 13.8.14 to 26.8.14.

¹⁸ The search was performed for 2015 entry for a student normally living in England, and entry requirements were then looked up on the university’s website, rather than the UCAS summary (in case of errors on the UCAS site). Where both a Bachelor’s and Master’s degree in a subject are available, requirements for Bachelor’s are chosen, and single honours where both single and joint courses are offered

¹⁹ A phrase used by Trinity College Cambridge, who also publish a list of A-levels by category, which is more prescriptive than that provided by Cambridge University overall (Trinity College Cambridge, 2015).

16) and that “for several university courses these vocational qualifications are not considered to be suitable”. They have therefore been included in the ‘less effective preparation’ category. All of these will be discontinued under current reforms, and are not discussed in the most recent edition (Russell Group, 2015).

NON-COUNTING

Many of the Russell Group universities describe general studies and critical thinking as not counting towards an A-level offer on their general admissions pages (11 for general studies, six for critical thinking), and more exclude them from counting within individual course requirements. ‘Informed Choices’ suggests that they should be taken as an ‘extra’, rather than as one of the A-level choices on which university applications will be based. They are therefore categorised as not counting at all, rather than being less effective preparation. ‘Informed Choices’ also includes citizenship in this category, but a review of the general entry requirements does not suggest that universities treat it as non-counting. It has therefore been categorised as ‘less effective preparation’. Both non-counting A-levels (and indeed citizenship) will be discontinued under current reforms.

The taxonomy is given in Table 2.

Table 2: Classification table for A-levels available for teaching in England in 2014/15

Facilitating	Useful	More limited suitability	Less effective preparation²⁰	Non-counting
Arabic	Ancient history	Art and design ²¹	Accounting	Critical thinking ^d
Bengali	Archaeology	Business studies	Anthropology ^{dn}	General studies ^d
Biblical Hebrew ⁿ	Classical civilisation	DT: product design (3-D design)	Applied art and design (double award) ^{*d}	
Biology	Classics	DT: product design (textiles) ⁿ	Applied art and design ^{*d}	
Chemistry	Computing	DT: systems and control technology	Applied business (double award) ^{*d}	
Chinese	Cymraig iaith gyntaf, Welsh first language ⁿ	Drama and theatre studies	Applied business ^{*d}	
Classical Greek	Economics	Electronics	Applied ICT (double award) ^{*d}	
Cymraig ail iaith, Welsh second language ⁿ²²	Economics and business ^d	Film studies	Applied ICT ^{*d}	
Dutch	English language and literature	ICT ²³	Applied science (double award) ^{*d}	
English literature	English language	Law	Applied science ^{*d}	
French	Environmental science	Media studies	Citizenship studies ^d	
Further mathematics	Geology	Music technology	Communication and culture ^d	
Geography	Government and politics	Physical education	Creative writing ^{dn}	
German	History of art	World development ^d	Dance	
Greek (modern)	Music		DT: food technology	

²⁰ Applied A-levels marked *

²¹ Includes 6 additional endorsements/pathways

²² No entries in England/combined with other subject in National Pupil Database markedⁿ

²³ Information and communication technology

Gujarati	Philosophy	Engineering* ^d
History	Psychology	Health and social care (double)* ^d
Human biology ^{24dn}	Religious studies	Health and social care* ^d
Italian	Sociology	Humanities ^{dn}
Japanese	Statistics	Leisure studies (double award)* ^d
Latin		Leisure studies* ^d
Mathematics		Media: communication and production* ^d
Modern Hebrew		Performances studies ^d
Panjabi		Performing arts* ^d
Persian		Science in society ^{dn}
Physics		Travel and tourism (double award)* ^d
Polish		Travel and tourism* ^d
Portuguese		
Pure mathematics ^d		
Russian		
Spanish		
Turkish		
Urdu		

DATA

National Pupil Database (NPD) data for all English students taking A-levels in year 13 in 2010, 2011 and 2012 was analysed to compare with the taxonomy based on expressed preferences. Attempts by subject are given for one cohort of English students taking at least one A-level in summer 2012, split by school or college type and gender. There were 657,000 students in this cohort at age 16, of whom 50% (331,000) continued to take at least one A-level in 2012, and 189,000 (29%) of the original cohort took at least three A-levels.

²⁴ To be discontinued marked^d

In order to review the apparent acceptability of these subjects for students accepted into UK universities and compare it with the taxonomy derived from expressed preferences, Higher Education Statistics Agency (HESA) data for university entrants in 2010/11, 2011/12 and 2012/13 was matched to NPD data for three cohorts of students (n= 557,646) taking at least three A-levels in 2010, 2011 and 2012²⁵. This dataset therefore included all English students entering UK universities in the same calendar year as their A-levels for all three cohorts, plus those with 2011 A-levels taking a gap year, and the 2010 A-level cohort with up to two gap years. This allowed 379,616 English students with at least three A-levels going to UK universities in these years to be matched to records of school attainment, including their A-level subjects. Of these, 115,877 entered Russell Group universities (30.5%).

WHO DOES WHICH A-LEVELS?

The number of entries by category of all 18 year old students in England doing at least one A-level in 2011/12 is given in Table 3. Facilitating A-levels account for nearly half of all entries, with 'useful' another quarter and 'more limited suitability' 20%. There are few entries for 'less effective preparation' subjects, which is part of the motivation to discontinue many of them. Of the two 'non-counting' A-levels, much the most popular is general studies, taken by 33,667 students. Critical thinking is more commonly taken to AS level only.

Table 3: A-level entries by category for 18 year olds in England taking at least one A-level in 2011/12

Category	Number of subjects	Number of entries
Facilitating	33	318,612
Useful	20	172,496
More limited suitability	14	143,078
Less effective preparation	27	34,684
Non-counting	2	34,544
Total	96	703,414

Figure 2 shows the number of A-level attempts by all students in England taking at least one A-level, split by gender and taxonomy category, for subjects with more

²⁵ Students with other qualifications such as BTEC, International Baccalaureate and Cambridge Pre-U are not included in this analysis.

than 500 entries in 2012 (excluding general studies and critical thinking). Details for all 96 subjects are given in Appendix 3.

Thirteen subjects are taken by more than 20,000 students. Maths is the most popular subject overall, followed by biology, psychology, history, English literature, art and design (all pathways combined), chemistry, physics, geography, sociology, business, English language and media studies. Just over half of these are classified as 'facilitating' (maths, biology, history, English literature, chemistry, physics and geography), three are 'useful' subjects (psychology, sociology and English language) and three 'more limited suitability' (art and design, business and media studies). Considerably more A-level attempts are made by female than male students overall (368,000 versus 300,000 'counting' A-levels), but facilitating subjects are taken by disproportionately high numbers of male students (160,000 attempts compared with 159,000 by females). This is unsurprising given the inclusion of maths, further maths, physics and chemistry in the list of facilitating subjects, and the relative popularity of all but further maths within facilitating subjects. Female students take many more subjects than males in the remaining three categories (209,000 attempts compared with 141,000).

Figure 2: Number of A-level attempts by all English students in 2012, by gender and subject category (>500 entries)

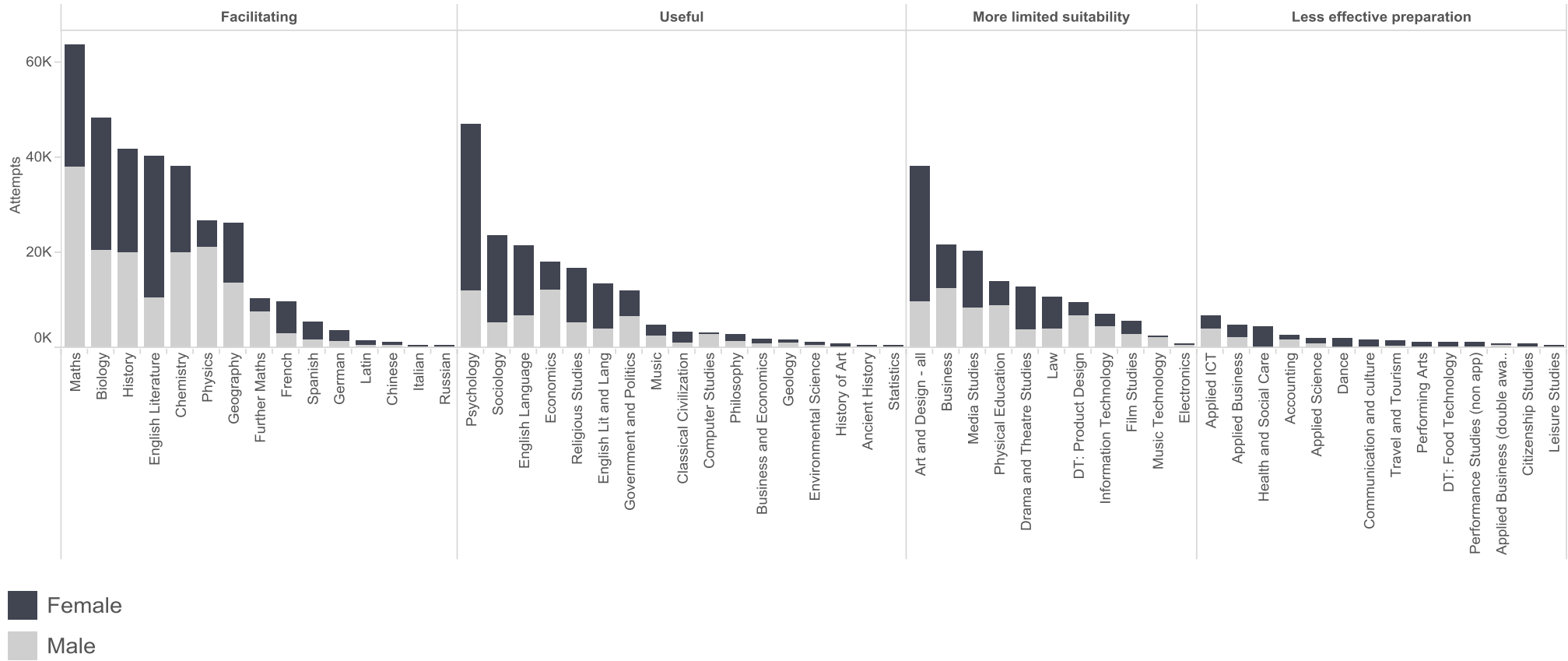


Figure 3 shows A-level attempts by school type and category for the 21 subjects held by more than 5% of the “three A-level” cohort of English students entering UK universities between 2010 and 2012. Take up of all facilitating subjects (with the exception of most community languages²⁶) is considerably higher in private schools than maintained schools, with 1.5 times the proportion of all students in private schools taking maths, physics, chemistry and geography, and over twice the proportion taking further maths and French. The differences between private schools and college students (sixth form and further education (FE) combined) are even greater.

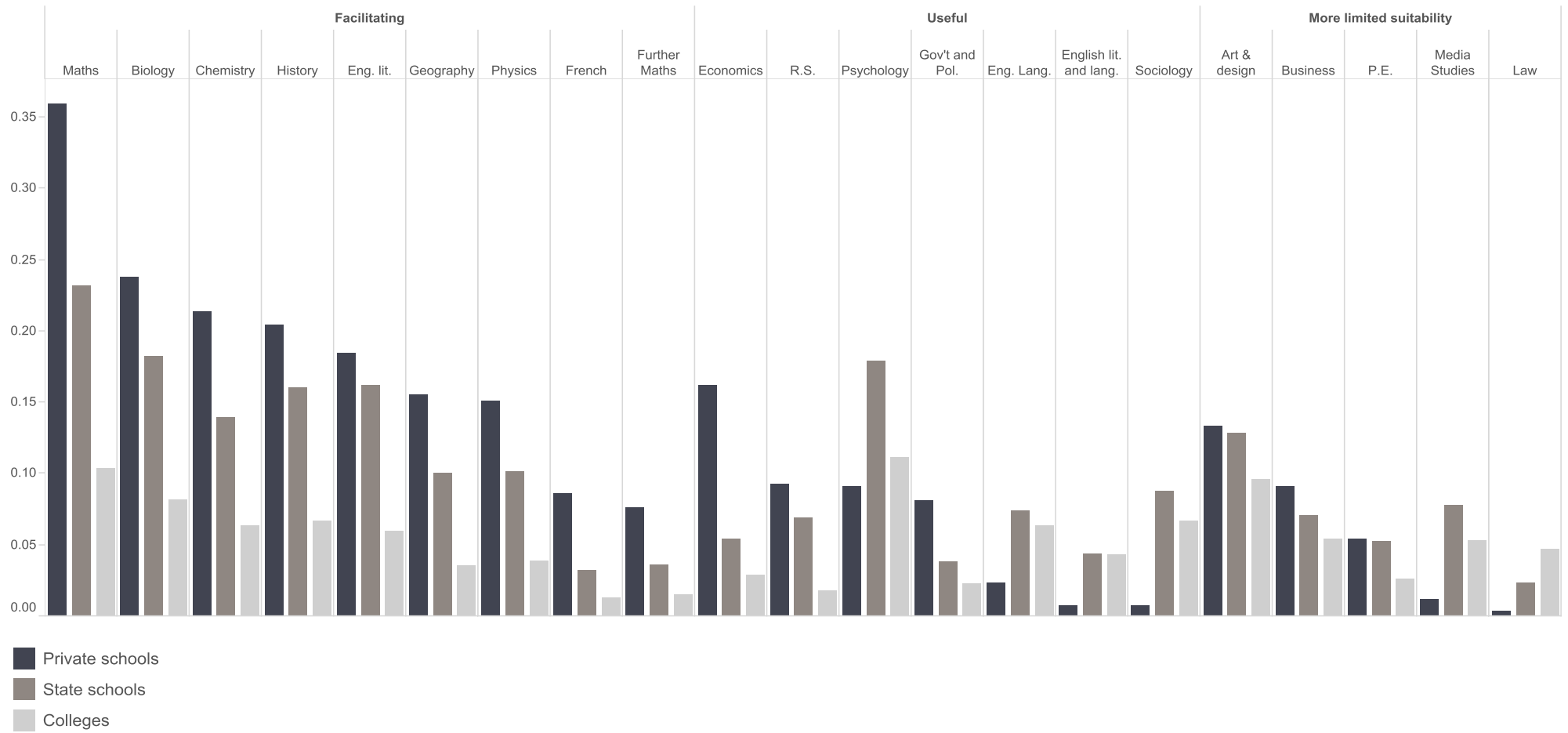
Subjects classified as ‘useful’ according to the taxonomy are also taken by significantly different proportions of maintained and private school students, although there is not the clear pattern observed for facilitating subjects. The largest difference is seen in economics, taken by some 16% of private school students but by less than a third of that proportion at state schools and colleges. Of other popular subjects, religious studies (RS) and government and politics are taken by higher proportions of private than state and college students. Psychology is the most popular ‘useful’ subject at state schools - indeed ranks third in popularity overall after maths and biology – followed by sociology and English language. All three of these subjects are taken by much smaller proportions of private school students.

Of the ‘more limited usefulness’ subjects, art and design, business and physical education (PE) are all taken by higher proportions of private than maintained school students, although the gaps are small in both absolute and relative terms. Private school students are much less likely to do media studies and law than their maintained school counterparts, with college students the most likely to take law.

No ‘less effective preparation’ subjects are taken by more than 5% of the cohort entering university, so none is included in Figure 3. As is shown in the detailed tables in Appendix 3, for all ‘less effective preparation’ subjects, fewer are taken in private schools than in the maintained sector. Although the differences in proportions between state and maintained schools are large, the absolute numbers are low, with only applied ICT being taken by more than 5,000 English year 13 students in 2012.

²⁶ Arabic, Bengali, Dutch, Gujarati, Modern Hebrew, Panjabi, Persian, Polish, Portuguese, Turkish, Urdu. There were only 1,306 attempts at these amongst this cohort.

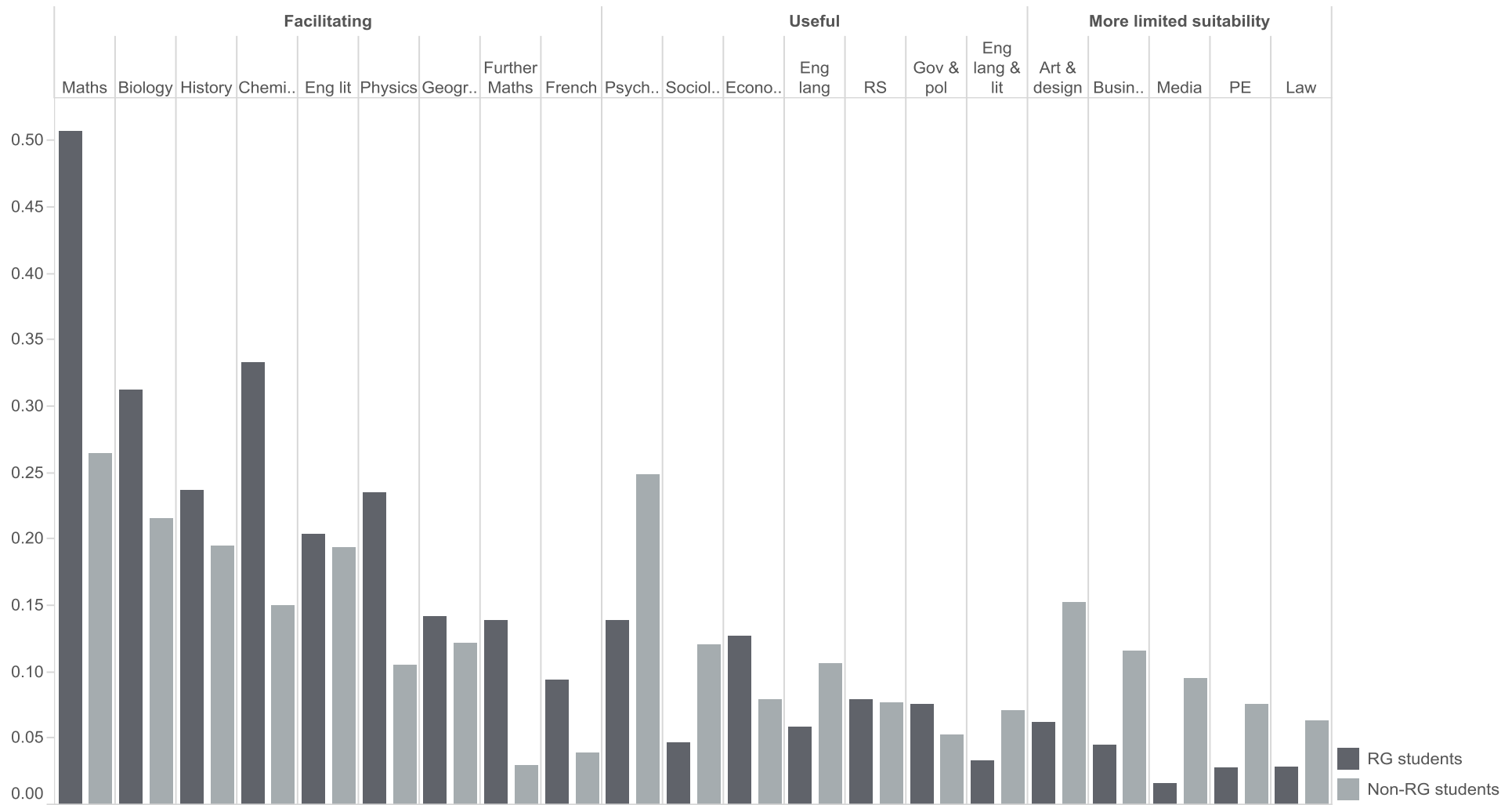
Figure 3: Proportion of students taking A-levels by school type (for the most popular subjects held by university entrants)



A-LEVELS HELD BY UNIVERSITY ENTRANTS

Figure 4 shows the most popular subjects held by English entrants with three or more A-levels to UK universities in 2010-2012. Each is taken by at least 5% of the sample. Appendix 4 gives details for all A-levels by university type.

Figure 4: Proportion of university entrants holding A-levels by university type and category (most popular subjects)



Nine of the 21 most popular subjects are facilitating, and for all of these higher proportions are held by RG entrants than non-RG entrants. There are particularly large gaps for sciences and (in relative terms) French. No account here is taken of prior attainment or of differences by school type, nor of the balance of degree courses provided by RG and non-RG universities. Table 4 shows the number of students in the sample analysed by highest level Joint Academic Coding System (JACS) code, and the proportion of each course group at RG universities. Social studies, languages and literature, physical sciences, engineering and technology, history and philosophy, maths, medicine and veterinary science students are proportionally more likely to enter RG than non-RG universities (overall the proportion is 30.5%) and many of these courses are likely to require specific facilitating A-levels.

Of the six 'useful' subjects taken by more than 5% of students, three (economics, RS, and government and politics) are held by a higher proportion of RG than non-RG entrants, suggesting that they are prima facie useful RG preparation. These three subjects are all taken by higher proportions of private than maintained school students (see Figure 3). It could be that these are known to be considered good RG university preparation by private schools, who then advise their students to take them, or it could be that other characteristics of private schools, including prior attainment and other advice on university entry, mean that their students are more likely to enter an RG university, whatever subjects they choose. A further reason could be the distribution of degree courses between RG and non-RG universities.

Psychology, English language, English language and literature, and sociology are all held by only around half the proportion of RG entrants as non RG. Psychology is second only to maths in popularity among non-RG students. The much lower proportion of RG entrants with psychology A-level may be suggestive that it is considered less good preparation by RG universities, but no account here is taken of prior attainment or type of school, both of which clearly make a large difference to chances of Russell Group entry. The same considerations apply to English language, English language and literature and sociology. All of these subjects are particularly popular in 6th form and FE colleges and maintained schools, as shown in Figure 3.

All five of the popular A-levels categorised as 'more limited suitability' are held by at least twice the proportion of non-RG as RG entrants (art and design, business, PE, media studies and law). Again this raw data does not take any account of mean grades held by students, nor of the distribution of degree courses followed by these students between RG and non-RG universities, but the pattern of holding this group of subjects is consistent with their being less suitable for RG entry in particular.

No 'less effective preparation' subjects were held by more than 5% of university entrants.

Table 4: Degree course groups of sample

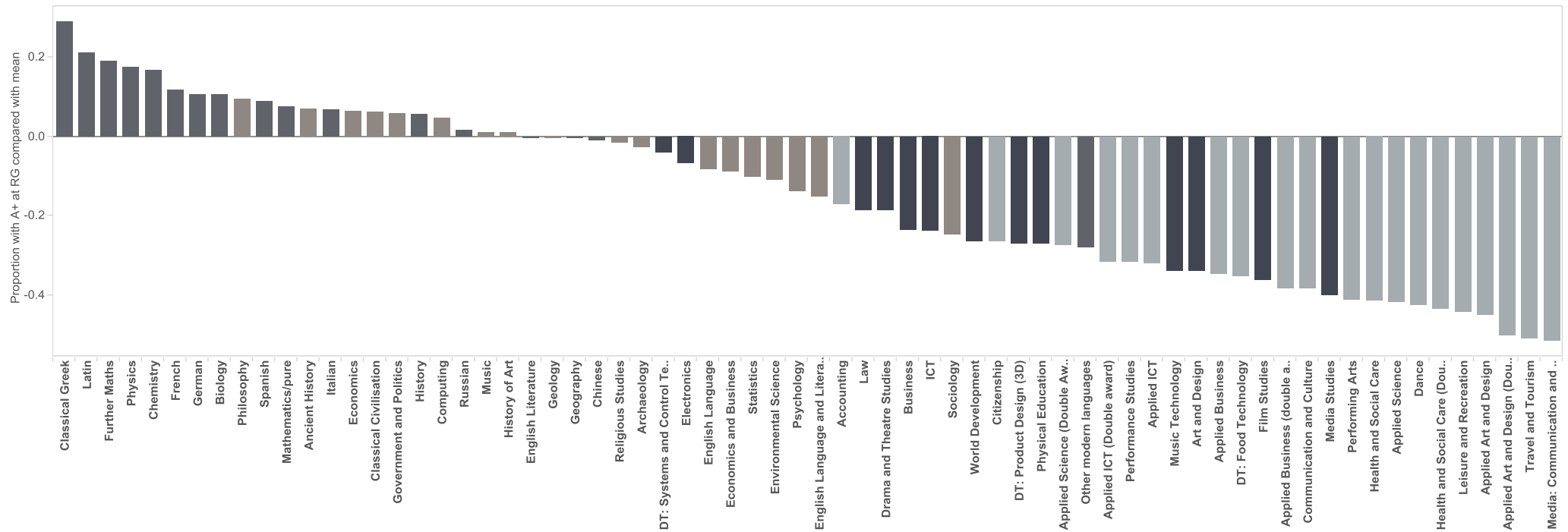
Subject group	Number of students	Proportion at Russell Group
Biological sciences	50,153	24.4%
Social studies	43,111	36.5%
Languages and literature	35,840	42.1%
Business and administrative studies	35,728	12.6%
Physical sciences	28,059	45.8%
Creative arts	27,090	8.7%
Subjects allied to medicine	25,085	32.8%
Engineering and technology	22,286	39.5%
History and philosophy	20,780	41.8%
Law	18,921	28.0%
Maths	15,318	48.1%
Mass communications	13,143	8.5%
Education	10,440	3.2%
Medicine	10,240	82.7%
Computer science	10,216	18.5%
Architecture, building and planning	6,319	23.2%
Subjects allied to veterinary science and agriculture	2,661	10.7%
Unspecific	1,714	27.7%
Unknown	1,541	0.0%
Veterinary science	971	67.8%
Total matched students in three cohorts	379,616	30.5%

Maths is much the most popular A-level subject among university students overall, held by more than half of all RG entrants and about 26% of non-RG entrants. The largest facilitating subject differences in absolute terms between entrants to Russell Group and non-Russell Group universities are in maths, chemistry and further maths, and the proportionate difference in further maths in particular is striking. Eight Russell Group universities had between just below 20% and 50% of entrants with further maths in the three cohorts examined. This raw result requires further examination in order to establish the relationship between entry, prior attainment, school type and distribution of degree courses, but may be particularly important in Russell Group entry given that a large proportion of English non-selective state schools and FE colleges do not teach further maths. It is smaller schools and colleges that do not provide it, so that although over a third of non-selective state schools and half of FE colleges with a three A-level cohort had no-one taking further maths in the three-year period, the number of students with no further maths apparently available to them was about 1 in 8.

For 6th form colleges, selective state schools and private schools the proportion without the option to take further maths was much lower. Modern languages are for the most part even less widely available in maintained non-selective schools and FE colleges, with Spanish and German not available to around 1 in 3 students, in broad terms, and French not available to around 1 in 6 FE students, although more available in maintained schools.

Figure 5 gives additional prima facie indication of effectiveness of individual subjects for Russell Group entry by taking grade as well as subject into account, albeit in a somewhat rudimentary way. A-levels are ranked according to the proportion of university students with at least an A in that subject being at a Russell Group university. Of the 883,058 A-levels at grade A or above held by the 379,616 students at university, 60.7% (536,202) were held by a student attending a Russell Group university. If subjects were accepted randomly, 60.7% of those with at least an A in each subject would be held by someone with a Russell Group place. Higher proportions than this suggest a subject that is facilitating of entry to Russell Group university overall.

Figure 5: Proportion of university students with an A in each subject attending RG university, compared with the mean across all subjects



Category

- Facilitating
- Useful
- More limited suitability
- Less effective preparation

The figure suggests that traditional modern and classical languages, maths and sciences and to a lesser degree history are all facilitating of RG entry, with having at least an A in each of these twelve subjects all being associated with a disproportionately high chance of being at a Russell Group university. This is of course a rudimentary way of assessing chances, without taking account of school type, distribution of courses, or attainment prior to A-level, all of which are likely to have influenced both subject choice and likelihood of successful application to a Russell Group university, but it is consistent with the Russell Group's description of these subjects as facilitating. Geography and English literature rank further down the scale, at around the proportion expected for getting at least an A, so not conferring any special advantage, on average. The most significant outlier in the list of facilitating subjects is the group of other modern languages, sometimes known as community languages²⁷. These are taken by few students, and are among the subjects currently under review (at October 2015) for reform or discontinuation.

'Useful' subjects are largely grouped together at between plus 10 percentage points (pp) and minus 19pp of what would be expected if places were awarded regardless of subject, but with sociology an outlier, at -25pp. This figure indicates that sociology is a less attractive subject to Russell Group universities than their published preferences suggest, although more work is needed to see whether the effect observed here is a result of the school type and other characteristics of those choosing sociology A-level, rather than because of the subject itself.

Evidence from the number of students entering Russell Group universities holding 'more limited suitability' A-levels as shown in Figure 5 also suggests that the expressed preferences of Russell Group universities are consistent with admissions practices, with the exception of the small number of students taking DT: systems and control technology, and electronics. Both of these subjects seem relatively efficacious for entry, and the reservations for general usefulness held by some Russell Group universities may be misplaced. Two subjects which conversely seem to result in fewer Russell Group places than expected for students holding at least an A are film studies and media studies, suggesting that they might better be categorised as 'less effective preparation'.

Having at least an A in the 'less effective preparation' subjects, which includes all the applied A-levels, is associated with being the least likely to be in a Russell Group rather than other university, although accounting is associated with somewhat higher chances than other 'less effective preparation' subjects, and is one of the few 'less effective preparation' subjects not to be discontinued in the current reforms..

Repeating the analysis for those holding at least a B in each subject rather than A gives a very similar picture.

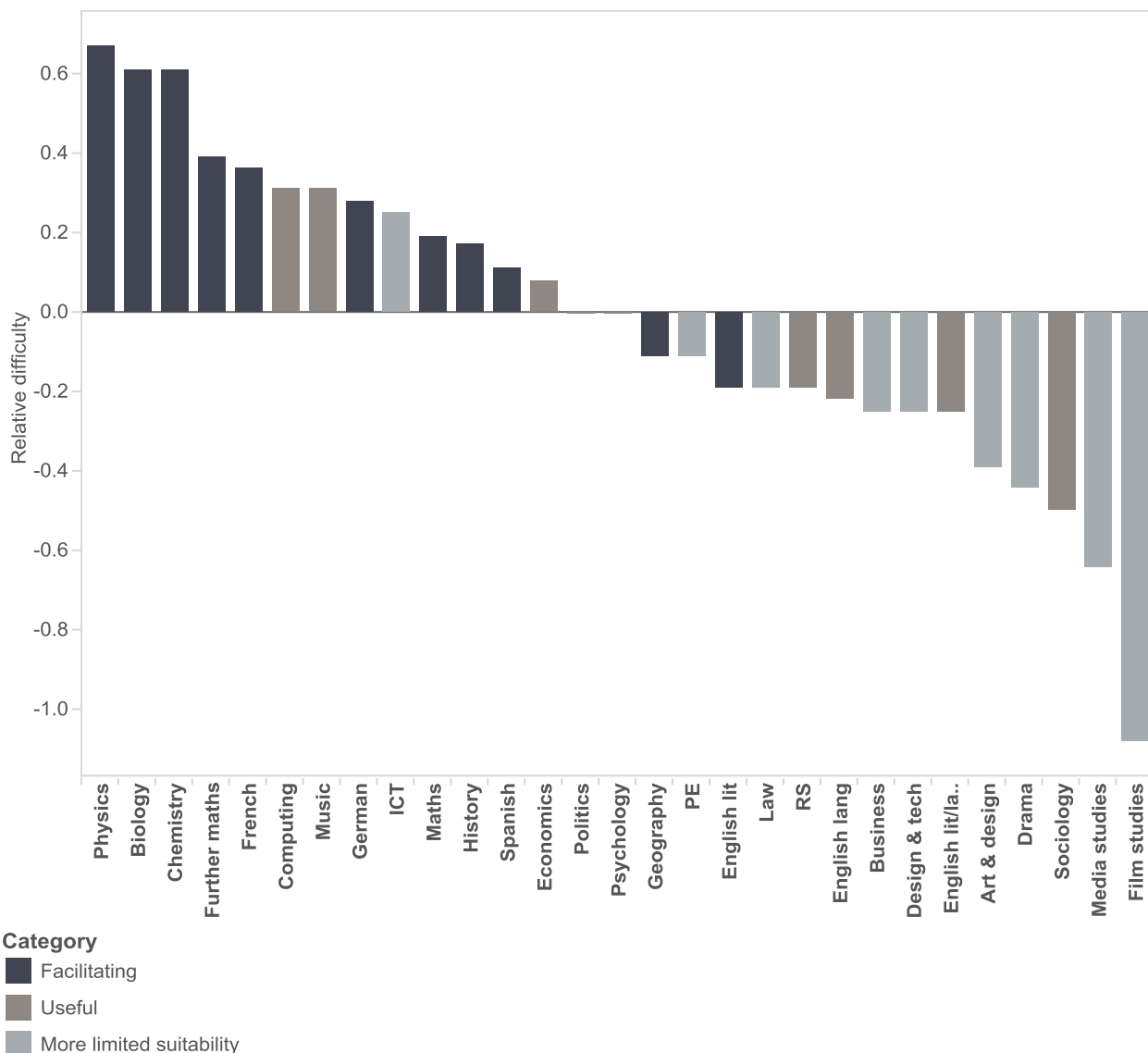
A-LEVEL CATEGORIES AND RELATIVE DIFFICULTY

Work by Noden, Shiner, and Modood (2014), using a classification of difficulty of popular A-levels based on the work of Coe, Searle, Barmby, Jones, and Higgins (2008) suggests that the more A-levels of above average 'difficulty' held by a student, the more likely they are to get a Russell

²⁷ Arabic, Bengali, Dutch, Gujurati, Japanese, Modern Greek, Modern Hebrew, Panjabi, Persian, Polish, Portuguese, Turkish, Urdu. Each of these is taken by fewer than 300 students over the three years.

Group place. Coe et al. (2008) examined relative difficulty using five different statistical methods (subject pairs analysis, common examinee linear models, the Rasch latent trait model, reference tests and value added models) applied to NPD data for the 2006 A-level cohort. Mapping the taxonomy onto their work suggests that on average facilitating subjects are more difficult than the mean, 'more limited suitability' are largely easier, and 'useful' lie both above and below. Figure 6 shows the correspondence between taxonomy categories and the mean difficulty across all methods of the 29 separately certified subjects they examine, excluding general studies. Two facilitating subjects, English literature and geography, are both ranked as below average difficulty in Coe et al's work, and English literature was the only facilitating subject found not to be associated with increased chances of Russell Group admission by Boliver (2013) and Chowdry et al. (2013). Sociology is again an outlier, being the least 'difficult' of the 'useful' subjects.

Figure 6: Relative difficulty (as mean grade difference) of A-levels by category (based on 2006 NPD) adapted from Coe et al. (2008) ²⁸



²⁸ Adapted from Figure 24 of Coe et al. (2008) p111.

CONCLUSION

In this paper I have set out a taxonomy based on the expressed preferences of the Russell Group itself and to some extent of its member universities. I have gone beyond the 'facilitating'/'non facilitating' dichotomy in order to provide a more detailed (although cautious in the context of expressed preferences for Russell Group entry) classification of the large number of non-facilitating subjects into 'useful', 'more limited suitability', 'less effective preparation' and 'non-counting'. I shall extend this work to consider whether the expressed preferences are consistent with actual preferences of Russell Group universities when making offers to applicants with different A-level subject choices, taking into account other characteristics of the students, their schools and universities. This taxonomy can inform students making A-level subject choices at 16+ and those who guide them.

The raw descriptive statistics set out in this paper suggest that most facilitating subjects are indeed facilitating of entry to Russell Group universities, with higher proportions of RG than non RG students having maths, science, classical and traditional modern language, and these subjects perhaps being valued because of their relative 'difficulty' as well as their subject content. Geography and English literature, whilst being held by a relatively high proportion of Russell Group entrants, appear less 'difficult'. This could just reflect the fact that fewer students study geography and English literature at university than subjects for which science subjects are required, but the fact that having A-levels in traditional modern languages (for which there are fewer university entrants) is associated with increased chances of entering RG universities suggests that some subjects are considered better general preparation than others, and is consistent with the role of 'difficulty' as described by Noden et al. (2014). The extent to which having facilitating subjects is a signal of ability, rather than a reflection of knowledge and skills required for particular courses is a topic which needs further examination.

The current classification (Department for Education, 2014) of modern community languages as facilitating is perhaps questionable. Having an A in these is not seen in general to be associated with increased chances of getting an RG place, and two universities (LSE, 2014; UCL, 2014) say that they will not include such languages among the 'counting' A-levels of native speakers.

In work to date, the role of further mathematics in facilitating entry to RG universities has not been examined. It is notable how many more RG entrants have it than non-RG, and very high proportions of students at some RG universities. Given the large number of non-selective maintained school and FE college students to whom it seems further maths A-level is not available, it is possible that it may account for some of the gap in participation from state schools and colleges. I will examine this in subsequent work.

Having an A in 'useful' subjects, those non-facilitating subjects about which no reservations are expressed, does seem to be associated with higher chances of being at a Russell Group university than more limited suitability courses, and less than facilitating subjects, on average. The 'useful' subjects where students with at least an A are most likely to be at a Russell Group university are those which are most popular in private schools, for example economics, and government and politics. Sociology seems to be an outlier; it is associated with a lower chance of RG entry, and is described as lower difficulty than the rest of the 'useful' subjects. Whether this is

a result of the perception of the subject by admissions staff, or other characteristics of those holding the subject - such as prior attainment and school effects to do with the university application process - is unclear, and merits further study.

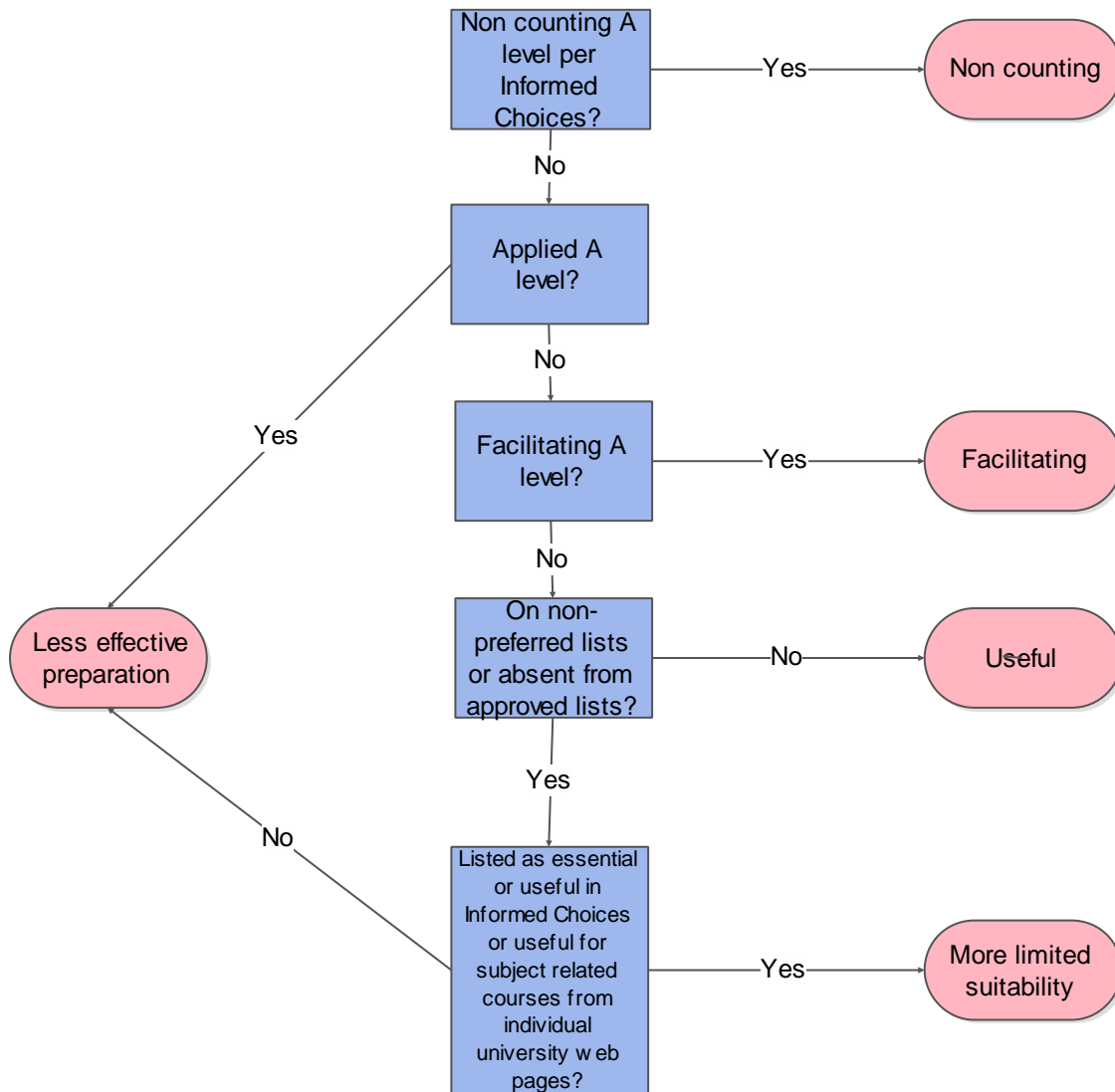
The 'more limited suitability' category is consistently associated with a lower chance of RG entry and lower difficulty than 'useful' subjects, although two small subjects (DT: systems and control technology and electronics) appear nearer the 'facilitating' end of Figure 5 than would be expected by their category. Conversely two popular subjects, film studies and media studies are held by disproportionately few RG students. Further work is needed to untangle the effects of prior attainment, school characteristics and distribution of mass communication courses between RG and non-RG courses on the acceptability of these subjects.

This work is descriptive, and based on expressed rather than revealed preferences of Russell Group universities, but it forms a useful basis from which to examine the role of A-level choice in university admission by grouping A-levels together in a meaningful way. Prima facie evidence from the descriptive statistics shows that some subjects do appear facilitating of RG entry. No account is taken in this work of combinations of subjects, which may also be important. The work also draws attention to possible sources of inequality in high status university admission through differences in the subjects offered by schools and colleges: if students are not able to take further maths, or some modern foreign languages, for example, then their chances of entry may be reduced.

APPENDIX 1

CLASSIFICATION PROCESS

Each of the 96 A-levels was classified into one of the five categories as follows:



APPENDIX 2

Search terms

Non-applied A-levels appearing on non-preferred lists (whether discussed in ‘Informed Choices’ or not) were checked to individual Russell Group entry requirements pages for courses to which they related²⁹ and to Informed Choices. The list of search terms for courses examined is given below.

A-level (and applied version where appropriate)	Search terms on UCAS course search tool (for students normally living in England)	Number of RG universities with relevant courses (including joint honours)	Omitted from preferred/on ‘non-preferred lists’ at which universities?	Is A-level ever described as essential/alternative required/preferred/useful for relevant courses?	Is A-level so described for courses listed in Informed Choices?
Accounting	Accounting, accounting and finance	19	Cambridge, LSE, UCL	No	No
Anthropology	Anthropology, archaeology and anthropology	13	Cambridge, UCL	No	No
Art and design	Art, fine art, design	6	LSE, Sheffield C	Yes	Yes
Business Studies	Business, management	22	Cambridge, LSE	No	Yes
Citizenship studies	Citizenship	0	Cambridge, Edinburgh, LSE, Sheffield, UCL	N/A	No
Communication and culture	Communication and culture	1	Cambridge, Edinburgh, LSE, Sheffield, UCL	No	No
Creative writing	Creative writing	6	Cambridge, Edinburgh, UCL	No	No
Dance	Dance	0	Cambridge, LSE, Sheffield, UCL	N/A	No
Design and technology: product design (3D),	Design, technology, design and technology	12	LSE, Sheffield, UCL	Yes	Yes

²⁹ Excluding general studies and critical thinking, as non-counting A-levels

product design (textiles), systems and control					
Drama and theatre studies	Drama, theatre studies, drama and theatre studies	12	Cambridge, LSE	Yes	Yes
Electronics	Electronics	20	Sheffield, UCL	Yes	No
Film studies	Film studies	11	Cambridge, Sheffield	Yes	No
Design and technology: food technology	Home economics, food	4	LSE, Sheffield, UCL	No	Not specific pathway
Humanities	Humanities	1	Cambridge, LSE, Sheffield	No	No
ICT	Information and communication technology, ICT, computing	23	Cambridge, LSE, Sheffield	No	Yes
Law	Law	23	LSE	No	Yes
Media studies	Media, film, media communication, media production	5	Cambridge, LSE, Sheffield, UCL	No	Yes
Music technology	Music technology, music	20	Cambridge, LSE, Sheffield, UCL	Yes	No
Performance studies	Performance, performing	4	Cambridge, LSE, Sheffield	No	No
Physical education	Sport, physical education, physiotherapy	11	Cambridge, LSE, Sheffield, UCL	Yes	Yes
Science in	Science in	3	Cambridge,	No	No

society	society		UCL		
World development	World development, geography	22	Cambridge ³⁰ , UCL	Yes	No

³⁰ Not on the Cambridge list of suitable preparation subjects, although described as useful for the relevant course (geography) at Cambridge.

APPENDIX 3

DETAILED A-LEVEL SUBJECT LISTS

Table 5: Facilitating subjects taken by all school and college students taking at least one A-level in 2012 (n=331,169)

Facilitating subjects	All attempts	Proportion of all students	Proportion of all female students	Proportion of all male students	Proportion all State school students	Proportion of all College students	Proportion all Private school students
Maths	63,427	19.2%	14.3%	24.9%	23.2%	10.4%	35.9%
Biology	48,231	14.6%	15.4%	13.6%	18.2%	8.2%	23.8%
History	41,606	12.6%	12.1%	13.1%	16.0%	6.7%	20.4%
English literature	40,310	12.2%	16.6%	6.9%	16.2%	6.0%	18.5%
Chemistry	37,992	11.5%	10.0%	13.2%	13.9%	6.3%	21.3%
Physics	26,684	8.1%	3.1%	13.9%	10.1%	3.9%	15.1%
Geography	25,950	7.8%	7.0%	8.9%	10.0%	3.5%	15.5%
Further maths	10,371	3.1%	1.7%	4.9%	3.6%	1.5%	7.6%
French	9,739	2.9%	3.8%	2.0%	3.2%	1.3%	8.6%
Spanish	5,397	1.6%	2.0%	1.2%	1.6%	0.8%	5.3%
German	3,525	1.1%	1.2%	0.9%	1.3%	0.5%	2.4%
Latin	1,275	0.4%	0.4%	0.4%	0.2%	0.0%	3.0%
Chinese	1,157	0.3%	0.4%	0.3%	0.1%	0.1%	2.6%
Italian	532	0.2%	0.2%	0.1%	0.2%	0.1%	0.5%
Russian	530	0.2%	0.1%	0.2%	0.1%	0.0%	1.1%
Polish	303	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Classical Greek	267	0.1%	0.1%	0.1%	0.0%	0.0%	0.7%
Arabic	218	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
Turkish	210	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Urdu	210	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
Japanese	157	0.0%	0.1%	0.0%	0.1%	0.0%	0.2%
Portuguese	141	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%
Other facilitating³¹	380	0.1%					
Total	318,612						

³¹ Subjects aggregated because of sparsely populated cells (<5): Persian, Dutch, pure maths, Panjabi, modern Greek, modern Hebrew, Bengali, Gujarati, (human biology not listed separately in NPD data for these years).

Table 6: 'Useful' subjects taken by all school and college students taking at least one A-level in 2012 (n=331,169)

Useful subjects	All attempts	Proportion of all students	Proportion of all female students	Proportion of all male students	Proportion of all State school students	Proportion of all College students	Proportion of all Private school students
Psychology	47,008	14.2%	19.5%	7.9%	17.9%	11.1%	9.1%
Sociology	23,627	7.1%	10.2%	3.6%	8.8%	6.7%	0.8%
English language	21,343	6.4%	8.2%	4.4%	7.4%	6.3%	2.4%
Economics	18,031	5.4%	3.2%	8.1%	5.4%	2.9%	16.2%
Religious studies	16,605	5.0%	6.4%	3.4%	6.9%	1.8%	9.3%
English Lit and Lang	13,356	4.0%	5.3%	2.5%	4.4%	4.3%	0.8%
Government and politics	11,884	3.6%	2.9%	4.4%	3.8%	2.3%	8.1%
Music	4,784	1.4%	1.4%	1.6%	1.7%	0.7%	3.1%
Classical civilization	3,279	1.0%	1.2%	0.8%	0.8%	0.8%	2.8%
Computer studies	3,061	0.9%	0.1%	1.9%	0.8%	1.1%	0.5%
Philosophy	2,688	0.8%	0.8%	0.8%	0.5%	1.1%	1.1%
Business and economics	1,726	0.5%	0.4%	0.6%	0.9%	0.0%	1.0%
Geology	1,599	0.5%	0.3%	0.7%	0.4%	0.6%	0.5%
Environmental science	1,051	0.3%	0.3%	0.4%	0.2%	0.5%	0.0%
History of art	912	0.3%	0.4%	0.1%	0.1%	0.1%	1.9%
Ancient history	588	0.2%	0.1%	0.2%	0.1%	0.2%	0.3%
Statistics	542	0.2%	0.1%	0.2%	0.1%	0.3%	0.1%
Archaeology	398	0.1%	0.1%	0.1%	0.0%	0.2%	0.1%
Classics (other)³²	14	0.0%					

³² No analysis by gender or school type because of sparsely populated cells (<5).

Total

172,496

Table 7: 'More limited suitability' subjects taken by all school and college students taking at least one A-level in 2012 (n=331,169)

More limited suitability	All attempts	Proportion of all students	Proportion of all female students	Proportion of all male students	Proportion of all State school students	Proportion of all College students	Proportion of all Private school students
Art and design - all	38,143	11.5%	15.9%	6.4%	12.8%	9.6%	13.3%
Business	21,777	6.6%	5.1%	8.3%	7.1%	5.4%	9.1%
Media studies	20,162	6.1%	6.6%	5.5%	7.8%	5.3%	1.2%
Physical education	13,776	4.2%	2.7%	5.8%	5.2%	2.6%	5.4%
Drama	12,701	3.8%	4.9%	2.6%	5.0%	2.1%	5.6%
Law	10,464	3.2%	3.6%	2.6%	2.4%	4.7%	0.3%
DT: product design	9,465	2.9%	1.6%	4.4%	4.4%	0.8%	4.3%
ICT	7,022	2.1%	1.5%	2.8%	2.6%	1.8%	1.4%
Film studies	5,471	1.7%	1.4%	1.9%	1.6%	2.1%	0.3%
Music technology	2,521	0.8%	0.2%	1.4%	0.8%	0.7%	0.6%
Electronics	901	0.3%	0.0%	0.6%	0.2%	0.4%	0.2%
World development	419	0.1%	0.1%	0.1%	0.1%	0.2%	0.0%
DT: systems and control³³	256	0.1%	0	0.2%			
Total	143,078						

³³ No analysis by school type because of sparsely populated cells (<5).

Table 8: 'Less effective preparation' subjects taken by all school and college students taking at least one A-level in 2012 (n=331,169)

Less effective preparation	All attempts	Proportion of all students	Proportion of all female students	Proportion of all male students	Proportion of all State school students	Proportion of all College students	Proportion of all Private school students
Applied ICT	6,583	2.0%	1.5%	2.5%	3.2%	1.0%	0.2%
Applied business	4,671	1.4%	1.3%	1.5%	2.5%	0.4%	0.2%
Health and social care	4,364	1.3%	2.4%	0.1%	1.7%	1.2%	0.0%
Accounting	2,454	0.7%	0.5%	1.0%	0.3%	1.3%	0.6%
Applied science	2,043	0.6%	0.7%	0.6%	1.0%	0.3%	0.0%
Dance	1,863	0.6%	1.0%	0.1%	0.6%	0.6%	0.2%
Communication and culture	1,631	0.5%	0.7%	0.3%	0.3%	0.8%	0.1%
Travel and tourism	1,407	0.4%	0.6%	0.3%	0.6%	0.4%	0.0%
Performing arts	1,101	0.3%	0.5%	0.2%	0.5%	0.2%	0.1%
DT: food technology	1,098	0.3%	0.5%	0.1%	0.6%	0.0%	0.2%
Performance studies (non applied)	991	0.3%	0.4%	0.1%	0.3%	0.4%	0.1%
Applied business (double award)	915	0.3%	0.2%	0.3%	0.5%	0.1%	0.0%
Citizenship studies	753	0.2%	0.3%	0.2%	0.3%	0.2%	0.0%
Leisure studies	567	0.2%	0.1%	0.2%	0.3%	0.1%	0.0%
Applied art and design (double award)	459	0.1%	0.2%	0.1%	0.2%	0.1%	0.0%
Applied art and design	400	0.1%	0.2%	0.1%	0.2%	0.0%	0.0%
Applied ICT (double	386	0.1%	0.0%	0.2%	0.1%	0.1%	0.0%

award)							
Applied science (double award)	312	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Engineering	178	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%
Travel and tourism (double award)	117	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
Leisure studies (double award)	57	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other less effective preparation³⁴	2,334						
Total	34,684						

Table 9: Non counting subjects taken by all school and college students taking at least one A-level in 2012 (n=331,169)

Non counting	All attempts	Proportion of all students	Proportion of all female students	Proportion of all male students	Proportion of all State school students	Proportion of all College students	Proportion of all Private school students
General studies	33,667	10.2%	10.3%	10.0%	12.9%	8.3%	4.6%
Critical thinking	877	0.3%	0.3%	0.3%	0.2%	0.3%	0.1%
Total	34,544						

³⁴ Subjects aggregated because of sparsely populated cells (<5): health and social care (double award), media: communication and production

APPENDIX 4

A-LEVEL SUBJECTS HELD BY ENGLISH UNIVERSITY STUDENTS

Table 10: Facilitating subjects held by all English students taking more than three A-levels in 2010-12 entering UK universities (n=379,616)

Facilitating	Number of university entrants with subject	Proportion of all university entrants with subject	Proportion of RG entrants with subject	Proportion of non-RG entrants with subject	Of all students with A grade, proportion at RG university
Classical Greek	538	0.1%	0.4%	0.0%	89.6%
Latin	2,638	0.7%	1.7%	0.2%	81.9%
Further Maths	23,882	6.3%	13.8%	3.0%	79.6%
Physics	55,039	14.5%	23.5%	10.5%	78.2%
Chemistry	78,184	20.6%	33.3%	15.0%	77.3%
French	21,177	5.6%	9.4%	3.9%	72.5%
German	7,858	2.1%	3.4%	1.5%	71.4%
Biology	93,122	24.5%	31.3%	21.5%	71.2%
Spanish	10,974	2.9%	4.6%	2.1%	69.5%
Mathematics ³⁵	128,573	33.9%	50.7%	26.5%	68.3%
Italian	956	0.3%	0.4%	0.2%	67.4%
History	78,807	20.8%	23.7%	19.5%	66.4%
Russian	840	0.2%	0.4%	0.1%	62.2%
English literature	74,394	19.6%	20.4%	19.3%	60.8%
Japanese	264	0.1%	0.1%	0.0%	60.8%
Geography	48,388	12.7%	14.2%	12.1%	60.5%
Chinese	1,183	0.3%	0.5%	0.2%	59.7%
Modern Hebrew	18	0.0%	0.0%	0.0%	55.6%
Modern Greek	72	0.0%	0.0%	0.0%	45.5%
Porguguese	194	0.1%	0.0%	0.1%	32.5%
Persian	85	0.0%	0.0%	0.0%	31.3%
Polish	298	0.1%	0.1%	0.1%	29.5%
Arabic	252	0.1%	0.0%	0.1%	29.3%
Dutch	80	0.0%	0.0%	0.0%	23.9%
Panjabi	75	0.0%	0.0%	0.0%	21.7%
Turkish	283	0.1%	0.0%	0.1%	17.7%
Urdu	221	0.1%	0.0%	0.1%	16.2%
Bengali	13	0.0%	0.0%	0.0%	0.0%
Gujarati	10	0.0%	0.0%	0.0%	0.0%

³⁵ Includes 118 students with pure mathematics A-level.

Table 11: 'Useful' subjects held by all English students taking more than three A-levels in 2010-12 entering UK universities (n=379,616)

Useful	Number of university entrants with subject	Proportion of all university entrants with subject	Proportion of RG entrants with subject	Proportion of non-RG entrants with subject	Of all students with A grade, proportion at RG university
Philosophy	4,844	1.3%	1.6%	1.1%	70.3%
Ancient history	839	0.2%	0.3%	0.2%	67.7%
Economics	35,436	9.3%	12.7%	7.9%	67.0%
Classical civilisation	5,827	1.5%	2.0%	1.3%	66.9%
Government and politics	22,630	6.0%	7.5%	5.3%	66.6%
Computing	5,682	1.5%	1.3%	1.6%	65.4%
Music	8,719	2.3%	2.5%	2.2%	61.7%
History of art	1,310	0.3%	0.5%	0.3%	61.7%
Geology	2,789	0.7%	0.9%	0.7%	60.6%
Religious studies	29,377	7.7%	7.9%	7.7%	59.4%
Archaeology	586	0.2%	0.1%	0.2%	58.1%
English language	34,922	9.2%	5.8%	10.7%	52.7%
Economics and business	2,955	0.8%	0.6%	0.9%	51.9%
Statistics	773	0.2%	0.1%	0.2%	50.6%
Environmental science	1,767	0.5%	0.3%	0.5%	49.9%
Psychology	81,752	21.5%	13.8%	24.9%	47.1%
English language and literature	22,519	5.9%	3.3%	7.1%	45.6%
Sociology	37,097	9.8%	4.7%	12.0%	36.1%

Table 12: 'More limited suitability' subjects held by all English students taking more than three A-levels in 2010-12 entering UK universities (n=379,616)

More limited suitability	Number of university entrants with subject	Proportion of all university entrants with subject	Proportion of RG entrants with subject	Proportion of non-RG entrants with subject	Of all students with A grade, proportion at RG university
DT: systems and control technology	429	0.1%	0.1%	0.1%	56.7%
Electronics	1,568	0.4%	0.5%	0.4%	54.0%
Law	20,022	5.3%	2.9%	6.3%	42.2%
Drama and theatre studies	19,577	5.2%	3.0%	6.1%	42.2%
Business	35,798	9.4%	4.5%	11.6%	37.3%
ICT	11,917	3.1%	1.2%	4.0%	36.9%
World development	548	0.1%	0.1%	0.2%	34.5%
DT: product design (3D³⁶)	13,836	3.6%	1.7%	4.5%	33.9%
Physical education	23,195	6.1%	2.7%	7.6%	33.9%
Music technology	3,563	0.9%	0.3%	1.2%	26.9%
Art and design - all	47,075	12.4%	6.2%	15.1%	26.8%
Film studies	6,841	1.8%	0.5%	2.4%	24.8%
Media studies	27,073	7.1%	1.6%	9.5%	20.9%

³⁶ No DT: product design (textiles) entries were recorded on the NPD database.

Table 13: Less effective preparation subjects held by all English students taking more than three A-levels in 2010-12 entering UK universities (n=379,616)

Less effective preparation	Number of university entrants with subject	Proportion of all university entrants with subject	Proportion of RG entrants with subject	Proportion of non-RG entrants with subject	Of all students with A grade, proportion at RG university
Engineering	224	0.1%	0.0%	0.1%	45.5%
Accounting	3,924	1.0%	0.5%	1.3%	43.6%
Citizenship	1,081	0.3%	0.1%	0.3%	34.5%
Applied science (double award)	409	0.1%	0.0%	0.2%	33.3%
Leisure and recreation (double award)	66	0.0%	0.0%	0.0%	33.3%
Applied ICT (double award)	642	0.2%	0.0%	0.2%	29.3%
Performance studies	1,689	0.4%	0.1%	0.6%	29.2%
Applied ICT	10,037	2.6%	0.7%	3.5%	29.0%
Applied business	6,465	1.7%	0.4%	2.3%	26.1%
DT: food technology	1,672	0.4%	0.2%	0.6%	25.7%
Applied business (double award)	1,379	0.4%	0.1%	0.5%	22.6%
Communication and culture	2,039	0.5%	0.2%	0.7%	22.5%
Performing arts	1,517	0.4%	0.1%	0.5%	19.6%
Health and social care	5,294	1.4%	0.3%	1.9%	19.4%
Applied science	1,903	0.5%	0.1%	0.7%	19.1%
Dance	2,427	0.6%	0.2%	0.8%	18.3%
Health and social care (double award)	2,446	0.6%	0.2%	0.9%	17.5%
Leisure and recreation	561	0.1%	0.0%	0.2%	16.7%
Applied art and design	440	0.1%	0.0%	0.2%	15.9%
Applied art and design (double award)	512	0.1%	0.0%	0.2%	10.9%
Travel and tourism	1,504	0.4%	0.0%	0.6%	10.0%

Media: communication and production	492	0.1%	0.0%	0.2%	9.5%
Travel and tourism (Double award)	117	0.0%	0.0%	0.0%	8.3%

Table 14: Non Counting A-levels split Russell Group/non Russell Group for all students taking at least three A-levels in 2010-12 matched to UK university entries

Non counting	Number of university entrants with subject	Proportion of all university entrants with subject	Proportion of RG entrants with subject	Proportion of non-RG entrants with subject	Of all students with A grade, proportion at RG university
Critical thinking	2592	0.7%	1.1%	0.5%	69.7%
General studies	74198	19.5%	21.8%	18.6%	63.2%

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