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# Private schooling, subject choice, upper secondary attainment and progression to university

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**ABSTRACT**

With approximately three times the resources per pupil in private compared with state schools, Britain's private sector presents an interesting case of what could be expected from schools that are extremely well resourced. This paper studies the links between private schooling and educational performance in upper secondary school, as measured through their performance in 'A level', the main school-leaving assessment which determines access to universities. Using an English longitudinal study, we find evidence that, compared with otherwise observably similar state school students in upper secondary education and controlling for prior attainment, those at private school study more 'facilitating' subjects, which are known to be favoured by high-status universities; they are placed 8 percentage points higher in the A level rankings and 11 percentage points higher in the rankings for 'facilitating' A levels. We find evidence of a private school advantage for participating in undergraduate study, net of socioeconomic status, subjects selected and number of A levels but there is no private school advantage for attending an elite university, controlling for the same characteristics. Taken together with other studies, our findings mean that private schooling in England is associated with cumulative moderate advantages at every stage of education.

**KEYWORDS**

Private education; independent school; educational attainment; A level; value-added

## Introduction

The prevalence and significance of private schools vary considerably across societies. In Britain, although they only educate a small proportion of the pupil population at any one time, their influence is extensive; there is a disproportionate representation of privately educated people among judges and other high-status professional occupations, in top political and cultural positions, and in high-paying jobs (e.g. Green, Machin, Murphy, & Zhu, 2011; Kirby, 2016; Reeves, Friedman, Rahal, & Flemmen, 2017). While some studies have explored these economic and social advantages associated with private schooling through social capital and social closure (for example Coleman, 2000), an important focus in recent literature on British private schools has been the human capital argument. Specifically, much of the socio-economic advantage is accounted for by the fact that private school pupils

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leave school with better qualifications, are more likely to go to university, and – among those that do go – are more likely to attend a high-status university, than those educated in the state sector (Green, Anders, Henderson, & Henseke, 2017b; Green, Henseke, & Vignoles, 2017a; Sullivan, Parsons, Green, Wiggins, & Ploubidis, 2017). Our understanding of the association of private schooling with pupils' attainment of educational qualifications and skills at different levels is, however, far from complete. This paper contributes evidence, for the first time, on the links between private schooling and educational performance in upper secondary school (the two final years of secondary schooling between the ages of 16–18, termed 'sixth form'), the gateway to universities in Britain.

The transition to college carries high stakes because there is an established hierarchy of universities in Britain, and a strong link between high-ranking universities and high-paying, influential positions (Britton, Dearden, Shephard, & Vignoles, 2016). Performance in upper secondary school therefore has a potentially large effect on pupils' life chances. There are, we suggest, two aspects of upper secondary educational performance through which private schools may affect the probability of transition to a high-status university: choice of subject majors ('A levels') and the grades attained. The paper also contributes further evidence on the links between private schooling, subject choice and university progression.

## Background

### Educational context in England

Private schools are to be found throughout the United Kingdom, but they are more prevalent in England: which is the focus of this paper. There are two main types of secondary school in England, private and state (which include grammar schools, academies and free schools). The private schools, funded largely through fees with some enhancement from bequests, make up one in eleven schools, operating with considerable autonomy: they are constrained only by employment legislation, a loose regulation of standards, the rigours of high-stakes national exams normally taken by pupils at grades 11 (GCSEs) and 13 (A levels), and the pressures of competition. They can set their own admission policies, and a half of private secondary schools are academically selective, in contrast with the state sector where fewer than 5 percent of schools – the regionally concentrated grammar schools – are permitted to select through an academic test, the rest mainly selecting based on catchment areas. The fees for private schools have trebled in real terms since 1980, the average reaching, by 2015, 50 percent of median family income (Green et al., 2017b). The resource gap between private and state sector at the sixth form stage is at least a factor of three, if boarding schools are included and additional rents from private schools' wealthy endowments are counted (Green & Kynaston, 2019).

### Private schools and educational outcomes

Historical evidence from the 1950s and 1960s had suggested that private school pupils' achievements at 'O' and 'A' levels (or their equivalents) were not significantly different from those of children from similar social backgrounds who had attended state-funded grammar schools (Halsey, Health, & Ridge, 1980). More recent research reveals that the privately-educated were achieving a small but significant academic lead over the state-

educated (at both primary and secondary levels); and the privately educated have higher probabilities of going to university (especially a prestigious university) and gaining a bachelor's degree than the state educated (Dearden, Ferri, & Meghir, 2002; Feinstein & Symons, 1999; O'Donoghue, Thomas, Goldstein, & Knight, 1997; Parsons, Green, Ploubidis, Sullivan, & Wiggins, 2017; Sullivan & Heath, 2003; Sullivan, Parsons, Wiggins, Heath, & Green, 2014). Among private, upper secondary school pupils in the early 1990s, those in the richer schools, with more teachers per pupil, were achieving better results at A level, conditional on prior attainment (Graddy & Stevens, 2003).

At the lower secondary level, Malacova (2007) shows that, between pupils' Key Stage 3 assessments (made in grade 9) in 2002 and their GCSE exams in 2004, those in Britain's private schools achieved a higher value-added than those in state schools. Ndaji, Little, and Coe (2016) also find a substantial average advantage for private school students, equivalent to nearly two-thirds of a grade per GCSE subject. These two studies both include controls for prior achievement, but lack controls for pupils' family background (though the latter includes the IDACI index of deprivation for the area where the pupil lived). The study by Smith-Woolley et al. (2018), by contrast, has good controls for both family background and pupils' prior achievements; it finds smaller, though still positive, effects on a composite score of pupils' mathematics, science and English grades at GCSE. An important contribution of this paper is that it includes a control for each pupil's genome-wide polygenic score (GPS): this score varied significantly across school types, giving evidence of some selectivity. However, a close reading of this study reveals that the pupils' GPS is less important than their socio-economic background, prior abilities and achievements for explaining the GCSE attainment gaps between children from private schools and comprehensive schools.[1] Moreover, an acknowledged limitation of this study is that it does not examine the whole curricula studied at age 16; instead it estimates the school 'effects' only on a composite score of pupils' mathematics, science and English grades. This narrow outcome measure may miss potentially more substantial gaps in subjects such as languages, other humanities subjects and the arts.

At upper secondary education, Hannay (2015) focuses on a value-added measure of progress from GCSE to A level. This paper shows that private schools have a modest overall lead over state schools, but that the private-state gap is heterogeneous, and varies between subjects. Despite upper secondary education being a critical stage for subsequent transition to higher education, no formal study with both prior attainment and socio-economic background controls has examined relative performance by school type. Moreover, the choice of A level subjects has been found to make a significant difference to pupils' futures (Dilnot, 2018). Until recently, according to Dilnot (2015) a lack of transparency was said to be hindering students from choosing their optimal A level subjects. Her taxonomy offers a framework for understanding the importance of subject choice for access to prestigious universities. This taxonomy captures the preferences of Russell Group universities, a self-selected group of research-intensive universities, formed in 1994. These preferences were expressed through a Russell Group publication called 'Informed Choices', which classified A level subjects into 'facilitating', 'useful', 'more limited suitability', 'less effective preparation' and 'non-counting' subjects (Russell Group, 2016).[2] With incomplete information among pupils, however, advice and direction from teachers are likely to be important influences on pupils' future trajectories. Dilnot's descriptive analysis shows that private school pupils disproportionately choose

'facilitating' subjects and Gill's (2017) analysis documents the differences of A level subject choice by school status. However, what is not known is whether this is a consequence of their socio-economic origins, or of the advice coming from private school staff, whose educational backgrounds are more likely to have involved direct experience of elite universities. There are hitherto no studies of whether different subject choices are made by children at private schools, once one controls for the much more affluent background from which private school pupils come.

Beyond the upper secondary level, the research is more definitive about the overall effect of private schooling on access to university, and in particular to higher-status universities. Thus Crawford and Vignoles (2014) conclude that attending a private school gives better access to elite universities by ensuring that students have higher academic attainment measured by UCAS tariff scores. The UCAS tariff scores are a linear score of achievement from post-16 education that assigns a numeric value to all of their achieved qualifications, subjects studied and specific grades, but the measure itself does not distinguish between particular subjects and grades. The finding of better access to universities for the privately educated, and specifically to elite universities, is also supported by Jerrim, Chmielewski, and Parker (2015) and Boliver (2013), who found this association holds over and above prior attainment.

In view of this review of literature, this paper contributes by providing formal evidence about the associations between going to a private school in England, the type of subjects followed at upper secondary level, and the academic progress made. We use data that includes controls for both socio-economic background (as measured by a rich set of variables) and for prior attainment, as measured by performance in GCSE exams at age 16. Our data apply to those attending upper secondary education during the years 2007–9. We address the following research questions:

RQ1. Are privately educated students in upper secondary schools likely to take more 'facilitating' A levels than state educated students?

RQ2. Given the subjects studied at A level, do privately educated students perform better than those educated in state schools?

RQ3. Is there a private school advantage for studying at any university or an elite university over and above the subjects studied and grades achieved at A level?

## Data and methods

We use Next Steps (formerly the Longitudinal Study of Young People in England) which follows a cohort of children born in 1989/1990. Next Steps began in 2004 when the sample members were aged between 13 and 14 and were followed annually until 2010 when they turned 19/20, and then again in 2015. Respondents were selected to be representative of young people in England using a stratified random sample. The cohort can be linked with the National Pupil Database (NPD) which provides attainment data for the census of pupils attending schools in England.

This paper concentrates on using the first seven sweeps of data. Our main variable of interest is private school attendance versus state funded schooling. This is measured at

each sweep within Next Steps. For the purpose of this paper we derive a measure which captures whether they are in private school at age 16–18, during their A level studies. In the sample who study for A levels, 14.6% are in private school at this age.

In addition to whether the student attended a private school or not, we make use of family background and individual characteristics from Next Steps from ages 13–16 to capture the main independent variables captured prior to the outcome variable. We take measures of social class,[3] parental education, equivalised permanent income,[4] housing tenure, ethnicity, gender and capped linear GCSE scores (Key Stage 4).[5] It may be that private school attendance (and indeed high levels of educational attainment) is clustered in certain areas of the country, therefore including location variables in the model is important. School differences in educational attainment may simply reflect differences in intake of schools. As earlier research by Blow, Blundell, Machin, and Sibieta (2011) has shown, private school attendance varies by income and regional inequality. Therefore it is important for these to be taken into account in the model, as both private school attendance and attainment may be related to region and income. By controlling for prior attainment and these other background characteristics we are able to isolate the 'effect' of private school attendance. Observations are included in the analytic models when the dependent variable response and the private school variable have no missing data. However, some independent variables have been shown to predict survey non-response (Piesse & Kalton, 2009), such as household income, parental qualifications and socio-economic classifications. To reduce potential bias from item-missing data, we used multiple imputation procedures (Johnson & Young, 2011) in STATA 15 to create 20 complete datasets using chained regressions to impute values for missing data on the predictor variables. The independent variables are missing between 2.42% and 3.74%. Then, following Rubin (1987) the estimates were combined across the 20 imputed datasets, and all estimates were weighted following the recommendations of Piesse and Kalton (2009) to account for the sampling structure.

Our main outcomes of interest are subject choice at A level and A level attainment. A levels, which are considered the traditional university-track course of study post-16,[6] are two-year courses and are usually assessed by examination. To make sense of subjects chosen at A level we group the courses following Dilnot's subject typology (2015) which can be used to identify subjects that are more likely to be helpful for admission to university. To model subject choice, we count the number of A levels taken within these subject groupings and use Poisson regression models as they assume that the dependent variable is not over-dispersed and does not have an excessive number of zeros.

To measure A level attainment, we compute a percentile rank of the young person's A level point score at age 18. This is computed first by standardising the A level result (Uniform Mark Scheme (UMS) score) by subject; that is, each student is given an average score by taking the total point score by subject and dividing it by the number of modular exams taken for that subject code. Thereafter, following the convention set by Chowdry, Crawford, and Goodman (2011), each student is allocated a unique rank within that subject; these ranks run from zero to one hundred, creating a variable which captures relative position. To allocate an overall rank position for students (rank grade total), we sum the rank position for the four best subjects studied at A level and calculate the mean rank. We also create ranks by subjects within each taxonomy.

We model two outcomes to further test whether there is a private schooling advantage: one is whether young people pursue undergraduate study at university, while the second, for those who pursue university study, is whether they attended an elite university (Russell Group). These university related outcomes are captured at waves six and seven, when the young people were aged 19/20, and record whether they have ever attended university and if so, what type.

With respect to the A level attainment we use Ordinary Least Squares (OLS) regression models which means we can interpret the coefficients as the average change in A level percentile rank associated with a unit change in the variable in question. As a robustness check we ran the same analysis using the standardised point scores of the dependent variables and the results are consistent. For the binary outcomes of university attendance and elite university attendance we use linear probability models to enable comparisons across models.

We restrict the main analytical sample to those students who study A levels only and for whom we have GCSE results; these exclusions result in an analytical sample of 5,852. We use richly specified regression models to estimate the 'effect' of private schooling. We acknowledge that this modelling strategy is vulnerable to omitted variable bias since our independent variables of interest may be correlated with unobserved variables that separately affect a student's educational attainment. We try to minimise this issue by taking into account the socio-demographic background characteristics (including prior attainment measures) available in Next Steps.

Descriptive statistics of background characteristics by state and private school are presented in Table 1. As can be seen, pupils at private schools do more 'facilitating' subjects at A level and fewer A levels classified as having 'more limited suitability'; they also have higher A level outcomes, both overall and in the 'facilitating' subjects. Specifically, the average private school pupil is placed at the 64$^{th}$ rung of the overall A-level rankings, that is, well above the median. However, it is also shown that the private school pupils arrive in the sixth form with significantly better prior attainment in GCSE, and come from households that have twice the income of the families of the pupils in state school sixth form.

**Table 1.** Descriptive statistics by school type and some background characteristics.

| | State | Private | Overall | N |
|---|---|---|---|---|
| Mean equivalised household income | £14,741 | £28,943 | £14,113 | 5,852 |
| Mean capped GCSE results | 362.5 | 395.33 | 363.22 | 5,852 |
| Female | 0.53 | 0.5 | 0.52 | 5,852 |
| Own house | 0.71 | 0.93 | 0.72 | 5,852 |
| Mean number of A levels studied | 3.6 | 4 | 3.61 | 5,852 |
| Mean number of 'facilitating' A levels | 1.34 | 2.55 | 1.39 | 5,852 |
| Mean number of 'useful' A levels | 0.4 | 0.49 | 0.41 | 5,852 |
| Mean number of 'more limited suitability' | 0.6 | 0.43 | 0.6 | 5,852 |
| Mean number of 'less effective preparation' | 0.28 | 0.06 | 0.27 | 5,852 |
| Mean number of 'non-counting' A levels | 0.37 | 0.33 | 0.37 | 5,852 |
| Mean total A level rank | 0.48 | 0.64 | 0.49 | 5,852 |
| Mean 'facilitating' A level rank | 0.45 | 0.63 | 0.46 | 3,903 |
| Mean 'useful' rank | 0.5 | 0.69 | 0.5 | 1,975 |
| Mean 'more limited suitability' rank | 0.5 | 0.65 | 0.5 | 2,615 |
| Mean 'less effective preparation' rank | 0.51 | 0.61 | 0.51 | 1,318 |
| Mean 'non-counting' A level rank | 0.49 | 0.61 | 0.49 | 2,048 |
| University attendance | 0.67 | 0.88 | 0.67 | 5,852 |
| Russell group university attendance | 0.20 | 0.39 | 0.21 | 3,816 |

## Results

The models for our four outcomes are presented, respectively, in Tables 2–5. For each outcome, the first model conditions only on school type, the second model additionally controls for prior attainment and the third model includes individual and socio-economic characteristics. This sequence enables us to see how the 'private school' coefficients are influenced by the inclusion of important explanatory variables.

### *Facilitating A levels*

We first address RQ1. The subject choice results in Table 2a (Model 1) show that the total number of A levels taken is 10% higher for those who attend private school than for those who attend a state school. This finding reproduces the descriptive finding from Table 1. However, the total number of A levels studied does not significantly vary by school type

**Table 2.** Predicting A level subject choice by school type.

| | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | Coef | SE | Coef | SE | Coef | SE |
| **a. Poisson Regression: Predicting number of A Levels studied** | | | | | | |
| Private School 16–18 | 0.10** | (0.03) | 0.03 | (0.03) | 0.00 | (0.03) |
| Constant | 1.28*** | (0.01) | 0.39** | (0.14) | 0.41** | (0.15) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.00 | | 0.19 | | 0.22 | |
| **b. Poisson Regression: Predicting number of 'facilitating' A Levels studied** | | | | | | |
| Private School 16–18 | 0.63*** | (0.04) | 0.34*** | (0.04) | 0.27*** | (0.05) |
| Constant | 0.29*** | (0.01) | −2.61*** | (0.36) | −2.41*** | (0.37) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.04 | | 0.37 | | 0.40 | |
| **c. Poisson Regression: Predicting number of 'useful' A levels** | | | | | | |
| Private School 16–18 | 0.22* | (0.10) | 0.12 | (0.10) | 0.10 | (0.10) |
| Constant | −0.91*** | (0.02) | −2.64*** | (0.35) | −2.26*** | (0.37) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.00 | | 0.02 | | 0.04 | |
| **d. Poisson Regression: Predicting number of 'more limited suitability' A levels** | | | | | | |
| Private School 16–18 | −0.35*** | (0.10) | −0.36*** | (0.10) | −0.40*** | (0.11) |
| Constant | −0.50*** | (0.02) | −2.15*** | (0.28) | −1.91*** | (0.30) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.00 | | 0.04 | | 0.05 | |
| **e. Poisson Regression: Predicting number of 'less effective preparation' A levels** | | | | | | |
| Private School 16–18 | −1.49*** | (0.27) | −1.24*** | (0.27) | −1.07*** | (0.27) |
| Constant | −1.28*** | (0.03) | −1.86*** | (0.24) | −2.48*** | (0.29) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.01 | | 0.04 | | 0.07 | |
| **f. Poisson Regression: Predicting number of 'non-counting' A levels** | | | | | | |
| Private School 16–18 | −0.13 | (0.12) | −0.36** | (0.12) | −0.43*** | (0.12) |
| Constant | −0.98*** | (0.02) | −4.73*** | (1.00) | −5.27*** | (1.01) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| R2 | 0.00 | | 0.10 | | 0.18 | |
| GCSE results | | | ✓ | | ✓ | |
| Region | | | | | ✓ | |
| Gender | | | | | ✓ | |
| Ethnicity | | | | | ✓ | |
| Equivalised household income | | | | | ✓ | |
| Social class background | | | | | ✓ | |
| Parental education | | | | | ✓ | |
| Housing tenure | | | | | ✓ | |

Standard errors in parentheses; ***p < 0.001, **p < 0.01, *p < 0.05, +p < 0.10.

once prior attainment and social background characteristics are controlled for (Table 2a, Model 2 & 3). The social background characteristics included are: region, gender, ethnicity, equivalised household income, parents' social class (taken as the highest social class of both parents), parents' education (highest qualification level of both parents) and housing tenure (taken as the most frequently mentioned form of housing from age 13–15).

Looking at the number of 'facilitating' subjects in Table 2b, we see that across all of the models there is a positive and significant private school coefficient. In Model 1 we see that the number of 'facilitating' A levels is 63% higher for those attending private school; in Model 2, this is attenuated to 34% once prior attainment is taken into account and in Model 3 when we include the social and individual background variables, the private school coefficient is 27%.

With respect to 'useful' subjects in Table 2c, we see that the empty model (Model 1) shows that those who attend private school take 22% more 'useful' subjects than those who attend state schools. However once prior attainment is taken into account (Model 2) the private schools coefficient is no longer significant.

For the remaining subject selections; 'more limited suitability', 'less effective preparation' and 'non-counting' (Table 2d–f) a consistent pattern is found by school type: that is, we see that those who attend private school take fewer of these subjects than those who attend state school at age 16–18 once prior attainment and social background controls are included.

### *A level performance*

To address RQ2, the models shown in Table 3a-f are Ordinary Least Squares regressions and the coefficients are percentile ranks of A level scores (running from 0–100). The results in Table 3a model the total A level rank; we see in Model 1 that attending a private school is associated with an increase in percentile rank by 16 points. This is attenuated once prior attainment is controlled for (Table 3a, Model 2) to 10 points and even further, once socio-demographic characteristics are controlled for, to eight percentile points. This means that a student from a private school with equivalent income, prior attainment and other characteristics is eight places higher on the ranking for total A level scores, e.g. the difference between being ranked 52 rather than 44. The difference in performance between state and private school students remains statistically significant in all models.

In Table 3b we see that attending a private school is associated with an increase in facilitating subjects rank by 17 percentile points (Table 3b, Model 1). Once we include prior attainment (Table 3b, Model 2) the private schools coefficient reduces to 12 percentile points, but this is still positive and significant. In Model 3, once socio-demographic characteristics and prior attainment are taken into account, we see that those who attend private school are 11 percentile points higher on the rank than those who attend state school.

In Table 3c there is a private school advantage in attainment of 'useful' A levels captured in Model 1 of 18 percentile points. Once prior attainment and socio-demographic characteristics are taken into account (Model 3) we see that there is an 11 percentile point ranking increase for 'useful' A levels for those who attend private school.

**Table 3.** Predicting A level rankings by school type.

| | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | β | SE | β | SE | β | SE |
| **a. OLS Regression Predicting total A level rank** | | | | | | |
| Private schooling 16–18 | 0.16*** | (0.02) | 0.10*** | (0.01) | 0.08*** | (0.01) |
| Constant | 0.48*** | (0.00) | 0.39*** | (0.03) | 0.43*** | (0.04) |
| Observations | 5,852 | | 5,852 | | 5,852 | |
| $R^2$ | 0.02 | | 0.28 | | 0.29 | |
| **b. OLS Regression Predicting 'facilitating' A level rank** | | | | | | |
| Private schooling 16–18 | 0.17*** | (0.02) | 0.12*** | (0.02) | 0.11*** | (0.02) |
| Constant | 0.45*** | (0.00) | 0.28** | (0.09) | 0.30** | (0.09) |
| Observations | 3,903 | | 3,903 | | 3,903 | |
| $R^2$ | 0.02 | | 0.27 | | 0.29 | |
| **c. OLS Regression Predicting 'Useful' A level rank** | | | | | | |
| Private schooling 16–18 | 0.18*** | (0.03) | 0.11*** | (0.03) | 0.11*** | (0.03) |
| Constant | 0.49*** | (0.01) | 0.39*** | (0.09) | 0.43*** | (0.10) |
| Observations | 1,975 | | 1,975 | | 1,975 | |
| $R^2$ | 0.02 | | 0.21 | | 0.22 | |
| **d. OLS Regression Predicting 'more limited suitability' A level rank** | | | | | | |
| Private schooling 16–18 | 0.15*** | (0.03) | 0.10*** | (0.03) | 0.09** | (0.03) |
| Constant | 0.49*** | (0.01) | 0.32*** | (0.08) | 0.34*** | (0.08) |
| Observations | 2,615 | | 2,615 | | 2,615 | |
| $R^2$ | 0.01 | | 0.21 | | 0.22 | |
| **e. OLS Regression Predicting 'less-effective preparation' A level rank** | | | | | | |
| Private schooling 16–18 | 0.09 | (0.08) | 0.07 | (0.07) | 0.07 | (0.07) |
| Constant | 0.51*** | (0.01) | 0.53*** | (0.07) | 0.57*** | (0.09) |
| Observations | 1,318 | | 1,318 | | 1,318 | |
| $R^2$ | 0.00 | | 0.08 | | 0.10 | |
| **f. OLS Regression Predicting 'non-counting' A level rank** | | | | | | |
| Private schooling 16–18 | 0.12*** | (0.03) | 0.05+ | (0.03) | 0.03 | (0.03) |
| Constant | 0.49*** | (0.01) | 0.03 | (0.24) | −0.02 | (0.24) |
| Observations | 2,048 | | 2,048 | | 2,048 | |
| $R^2$ | 0.01 | | 0.27 | | 0.30 | |
| GCSE results | . | | ✓ | | ✓ | |
| Region | | | | | ✓ | |
| Gender | | | | | ✓ | |
| Ethnicity | | | | | ✓ | |
| Equivalised household income | | | | | ✓ | |
| Social class background | | | | | ✓ | |
| Parental education | | | | | ✓ | |
| Housing tenure | | | | | ✓ | |

Standard errors in parentheses; ***p < 0.001, **p < 0.01, *p < 0.05, +p < 0.10.

Turning to Table 3d, which shows the results for 'more limited suitability' subjects, we see the private school attainment advantage remains. As before the results are attenuated once prior attainment and socio-demographic control variables are included, but we still see a statistically significant increase in rank by nine percentile points for those who attend private school and take 'more limited suitability' subjects.

The attainment results by school type for 'less effective preparation' A levels (Table 3e) and 'non-counting' A levels (Table 3f) are not statistically significant.

Taken together we can see that attending private school is associated with achieving higher rankings in A level scores for 'facilitating', 'useful', 'more limited suitability' and total A level rankings. This seems to suggest that private schools are better able to prepare students for the subjects which are seen as most effective in securing a place at prestigious universities.

### *Access to university*

Addressing RQ3, the results in Table 4 (Models 1–4) estimate the association between school type and studying at a university. Model 1 shows that there is a positive and significant private school effect of nine percentile points for attending any university, net

**Table 4.** Predicting university attendance by school type and A levels.

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Private school | | + Number of A levels | | + All A level rank | | + Disaggregated facilitating & non-facilitating | |
| | β | SE | β | SE | β | SE | β | SE |
| **Ref: State schooling** | | | | | | | | |
| Private schooling 16–18 | 0.09** | (0.03) | 0.08* | (0.03) | 0.07* | (0.03) | 0.06* | (0.03) |
| **Number of A levels (Ref: None)** | | | | | | | | |
| One | | | 0.03 | (0.03) | −0.09* | (0.04) | | |
| Two | | | 0.05+ | (0.03) | −0.08* | (0.04) | | |
| Three | | | 0.14*** | (0.03) | 0.01 | (0.04) | | |
| Four or more | | | 0.20*** | (0.03) | 0.06+ | (0.04) | | |
| **Rank grade total A levels (Ref: Decile 1)** | | | | | | | | |
| Two | | | | | 0.07* | (0.03) | | |
| Three | | | | | 0.15*** | (0.03) | | |
| Four | | | | | 0.18*** | (0.03) | | |
| Five | | | | | 0.17*** | (0.03) | | |
| Six | | | | | 0.23*** | (0.04) | | |
| Seven | | | | | 0.21*** | (0.04) | | |
| Eight | | | | | 0.22*** | (0.03) | | |
| Nine | | | | | 0.21*** | (0.04) | | |
| Ten | | | | | 0.23*** | (0.03) | | |
| **Number of facilitating subjects (Ref: None)** | | | | | | | | |
| One | | | | | | | 0.08* | (0.03) |
| Two | | | | | | | 0.10** | (0.04) |
| Three or more | | | | | | | 0.15*** | (0.04) |
| **Rank grade total facilitating A Levels (Ref: Decile 1)** | | | | | | | | |
| Two | | | | | | | 0.02 | (0.04) |
| Three | | | | | | | 0.07+ | (0.04) |
| Four | | | | | | | 0.08* | (0.04) |
| Five | | | | | | | 0.06 | (0.04) |
| Six | | | | | | | 0.09* | (0.04) |
| Seven | | | | | | | 0.10** | (0.04) |
| Eight | | | | | | | 0.11** | (0.04) |
| Nine | | | | | | | 0.11** | (0.04) |
| Ten | | | | | | | 0.08* | (0.04) |
| **Number of non-facilitating subjects (Ref: None)** | | | | | | | | |
| One | | | | | | | −0.13*** | (0.04) |
| Two | | | | | | | −0.10** | (0.04) |
| Three or more | | | | | | | −0.05 | (0.04) |
| **Rank grade total non-facilitating A Levels (Ref: Decile 1)** | | | | | | | | |
| Two | | | | | | | 0.06 | (0.04) |
| Three | | | | | | | 0.12*** | (0.04) |
| Four | | | | | | | 0.15*** | (0.04) |
| Five | | | | | | | 0.14*** | (0.04) |
| Six | | | | | | | 0.19*** | (0.04) |
| Seven | | | | | | | 0.16*** | (0.04) |
| Eight | | | | | | | 0.15*** | (0.04) |
| Nine | | | | | | | 0.17*** | (0.04) |
| Ten | | | | | | | 0.18*** | (0.04) |
| Constant | 0.15* | (0.06) | 0.15* | (0.07) | 0.22*** | (0.07) | 0.28*** | (0.07) |
| Observations | 5,852 | | 5,852 | | 5,852 | | 5,852 | |

Controlling for GCSE results; region; gender; ethnicity; equivalised household income; social class background; parental education; housing tenure. Standard errors in parentheses ***p < 0.001, ** p < 0.01, *p < 0.05, +p < 0.10.

of socio-economic background factors and prior attainment. Once the number of A levels studied is controlled for (Model 2) the private school coefficient drops to eight percentile points. Model 3 shows that, conditional on total standardised A level grades, the private school advantage is attenuated slightly to seven percentile points. In Model 4 we disaggregate the A levels to examine the association between facilitating subjects and non-facilitating, their number and their total standardised A level grades. From this we can see that the private school advantage remains of six percentile points compared to those who attended a state school. Moreover we can see that there is a net advantage on the number of facilitating subjects taken and the higher ranked grades score achieved on attending any university.

Table 5 (Models 1–4) estimate whether there is a private school advantage for attending elite universities (Russell Group). The results in Model 1 show that there is a private school advantage of ten percentile points of attending a Russell Group university, net of prior attainment and socio-economic status. When we take into account the number of A levels and rank grade total A levels (Model 3) the private school advantage attenuates to six percentile points and is only marginally significant. The private school advantage is fully explained away in Model 4 where we disaggregate the A level subjects to facilitating and non-facilitating, exploiting the number and grade rank achieved in each; this result contrasts with the finding of Boliver (2013), whose study did not include controls for GCSE score, gender, household income and housing tenure. Importantly, facilitating subjects are a statistically significant and positive predictor of attending a Russell Group university, suggesting that the information outlined in 'Informed Choices' is borne out in the data.

## Discussion

The empirical evidence presented here shows that there are different A level subjects selected and different A level attainments by school-type from age 16–18. More specifically, we have shown that students who attend private schools in late adolescence, controlling for GCSE attainment and socio-economic background, take 27 percent more 'facilitating' subjects – which are considered to be valuable by Russell Group universities; they also take fewer subjects that are not held in high esteem by these same universities. There are plausible ways in which these school-curricula differences may arise. There are, for example, differences between private and state schools in teacher expertise, number of staff, and other resources. In addition to this it may be an issue of targeting, where private schools offer a curriculum which they deem appropriate for the ability, aspirations and socio-economic composition of the students: within private schools it may be that students are directed towards these 'facilitating' subjects because they are judged to be more effective for progression to high-status universities. Moreover the subject choices and the academic performance of private school students may be influenced by the peer environment which comprises of highly motivated and resourced individuals.

Our results also show that attending private school is associated with an increase in the rank position of their A level results for 'facilitating', 'useful', 'more limited suitability' A levels, and for the all A levels taken together. According to our preferred model with full controls, going to a private school is associated with an eight percentage point rise up the overall A level rankings (this could be equivalent to the difference between a student with

**Table 5.** Predicting Russell Group university attendance by school type and A levels.

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Private school | | + Number of A levels | | + All A level rank | | + Disaggregated facilitating & non-facilitating | |
| | β | SE | β | SE | β | SE | β | SE |
| **Ref: State schooling** | | | | | | | | |
| Private schooling 16–18 | 0.10** | (0.03) | 0.10** | (0.03) | 0.06+ | (0.03) | 0.02 | (0.03) |
| **Number of A levels (Ref: None)** | | | | | | | | |
| One | | | 0.01 | (0.04) | 0.00 | (0.05) | | |
| Two | | | −0.04 | (0.03) | −0.03 | (0.04) | | |
| Three | | | −0.04 | (0.03) | 0.01 | (0.04) | | |
| Four or more | | | 0.05* | (0.03) | 0.10** | (0.04) | | |
| **Rank grade total A levels (Decile 1)** | | | | | | | | |
| Two | | | | | −0.09* | (0.04) | | |
| Three | | | | | −0.10** | (0.04) | | |
| Four | | | | | −0.12** | (0.04) | | |
| Five | | | | | −0.09* | (0.04) | | |
| Six | | | | | −0.05 | (0.04) | | |
| Seven | | | | | 0.06 | (0.04) | | |
| Eight | | | | | 0.12** | (0.04) | | |
| Nine | | | | | 0.17*** | (0.04) | | |
| Ten | | | | | 0.16*** | (0.04) | | |
| **Number of facilitating subjects** | | | | | | | | |
| One | | | | | | | −0.01 | (0.03) |
| Two | | | | | | | 0.05 | (0.04) |
| Three or more | | | | | | | 0.20*** | (0.04) |
| **Rank grade total facilitating A Levels (Decile 1)** | | | | | | | | |
| Two | | | | | | | 0.00 | (0.04) |
| Three | | | | | | | −0.01 | (0.04) |
| Four | | | | | | | −0.03 | (0.04) |
| Five | | | | | | | −0.03 | (0.04) |
| Six | | | | | | | 0.05 | (0.04) |
| Seven | | | | | | | 0.08* | (0.04) |
| Eight | | | | | | | 0.17*** | (0.04) |
| Nine | | | | | | | 0.15*** | (0.04) |
| Ten | | | | | | | 0.15*** | (0.04) |
| **Number of non-facilitating subjects** | | | | | | | | |
| One | | | | | | | 0.02 | (0.04) |
| Two | | | | | | | 0.02 | (0.04) |
| Three or more | | | | | | | 0.04 | (0.04) |
| **Rank grade total non-facilitating A Levels (Decile 1)** | | | | | | | | |
| Two | | | | | | | −0.08* | (0.04) |
| Three | | | | | | | −0.05 | (0.04) |
| Four | | | | | | | −0.08* | (0.04) |
| Five | | | | | | | −0.05 | (0.04) |
| Six | | | | | | | −0.06 | (0.04) |
| Seven | | | | | | | 0.01 | (0.04) |
| Eight | | | | | | | 0.05 | (0.04) |
| Nine | | | | | | | 0.06 | (0.04) |
| Ten | | | | | | | 0.07 | (0.04) |
| Constant | −0.30*** | (0.06) | −0.27*** | (0.07) | −0.16* | (0.07) | −0.11+ | (0.07) |
| Observations | 3,816 | | 3,816 | | 3,816 | | 3,816 | |

Controlling for GCSE results; region; gender; ethnicity; equivalised household income; social class background; parental education; housing tenure. Standard errors in parentheses ***p < 0.001, **p < 0.01, *p < 0.05, +p < 0.10.

AAB to a student with AAA), and an 11 percentage point rise up the rankings for 'facilitating' A levels (this could be equivalent to the difference between a student with ABB to a student with AAA); these are non-trivial 'effects' which, if interpreted as reflecting a causal impact from private schools, could be set against the high fees by parents who are considering whether to invest in private education for their child at sixth form.

Despite not finding a statistically significant private school advantage for attending an elite university, we do find evidence of a private school advantage of progressing to undergraduate study at *any* university over and above A level attainment, prior attainment and family background of six percentile points. This suggests that a private school advantage remains, net of these observed characteristics and therefore may be a source of inequality in university access. Moreover, as our research shows that private school students take more facilitating subjects, it is through this academic environment that they are better able to unlock access to elite universities.

There are two possible mechanisms for a private school impact on academic outcomes in England. The most important, highly plausible, mechanism is the resource gap – the vastly superior resources per pupil in private schools (roughly three times the state school average), including the small pupil-teacher ratios (roughly half the state school average). The recent evidence from quasi-experimental studies find significant effects of resources on academic outcomes (e.g. Hong & Zimmer, 2016; Jackson, Johnson, & Persico, 2016) including, specifically, modest but significant effects of lower class sizes (e.g. Fredriksson, Öckert, & Oosterbeek, 2013). One possible explanation advanced for null findings (where these are found) is that the effect is non-linear, with teachers and others able to compensate by adapting to small differences (Gibbons and McNally, 2013) but not to larger ones (as is the case with the private/state comparison).

A second possible mechanism is that the peer effects of other pupils may be influencing the private/state performance gap, just as is found in a range of other countries at the lower secondary level (Sakellariou, 2017). The importance of peer effects is well established in both quasi-experimental and observational studies (e.g. Antecol, Eren, & Ozbeklik, 2016). However, in England pupils who do not achieve well at GCSEs do not proceed to A level study; at sixth form level there are therefore lesser peer group differences between private and state pupils, whether in terms of attainment or behaviour. Hence, even though the sectors still vary in their prior attainments at GCSE (see Table 1), a private/state difference in peer effects is a less obvious mechanism to help account for performance differences than it is at the primary and lower secondary stages.

The present analysis has some limitations. Firstly, we make use of Next Steps which, like most longitudinal studies, suffers from attrition. We have taken steps to address the missing data problem including the use of multiple imputation, but there is a possibility that we are underestimating the differential effects of school type or that some bias remains. Secondly, we cannot view our results as truly causal, but rather as capturing conditional relationships between social background and private school attendance, and between private school attendance and A levels studied and A level results. Nevertheless, our estimates of educational attainment by institution type, amongst otherwise similar students, should be informative for policy-makers.

Whether the advantage from private upper secondary education might have been diminished for cohorts who studied the reformed A level (implemented from 2015) is a question which warrants further attention, in particular, whether the change in A level subjects offered and assessment methods adopted advantages any particular group of students. In future research with this data, it will be possible to study the extent to which these attainment gains associated with private school sixth forms translate into more rewarding positions in the labour market. There also remains the opportunity to explore the links between private schooling, university entrance and

extracurricular activities (such as music theory) which may contribute towards the UCAS tariff.

While this is the first formal study to examine the private/state performance gap in upper secondary education in the 21st century, our findings should be seen alongside the evidence from existing literature pertaining to earlier stages; this shows that attending private schools in Britain is associated with modest but significant differences in attainment at both primary and lower secondary levels. These findings emerge from studies that, crucially, like ours control for prior attainment as well as socio-economic background. The increments from the primary and lower secondary stages cumulate to a more substantial difference by the start of the final, upper secondary, stage of school. At that point, more private school pupils than state school pupils (in our sample 78% compared with 60%) progress to sixth forms to study for A levels; moreover, those that do progress to sixth forms have higher prior attainment as measured by their GCSE scores. Then, as our evidence reveals, among those doing A levels private school pupils continue to make greater progress in the last two years of school – especially in 'facilitating' subjects. Thus, overall we have a picture of cumulative advantage from Britain's private education in Britain – consistent with the large resource gap at each stage. Those who are privately educated are then set to profit beyond school with better university access and improved labour market rewards.

## Notes

1. For this interpretation, see Figure 1 in Smith-Woolley et al. (2018).
2. **'Facilitating'** subjects: Modern foreign languages, ancient foreign languages, Biology, Chemistry, English literature, Mathematics, Further mathematics, Pure mathematics, Geography, History, Human biology, physics. **'Useful'** subjects: Ancient history, Archaeology, Classical civilisation, classics, computing, Welsh first language, Economics, Economics and Business, English language and literature, Environmental science, Geology, Government and politics, History of art, Music, Philosophy, Psychology, Religious Studies, Sociology, Statistics. **'More limited suitability'** subjects: Art and design, Business studies, Design Technology (product design (3D, textiles) and systems and control technology), Drama and theatre studies, Electronics, Film studies, ICT, Law, Media Studies, Music technology, Physical education, World development. '**Less effective preparation**' subjects: Accounting, Anthropology, Applied art and design, Applied business, Applied ICT, Applied science, Citizenship studies, Communication and culture, Creative writing, Dance, Design Technology (food technology), Engineering, Health and social care, Humanities, Leisure studies, Media communication and production, Performances studies, Performing arts, Science in society, Travel and tourism. '**Non-counting'** subjects: Critical thinking, General studies.
3. Social class is measured using the National Statistics Socio Economic Classification (NS-SEC) which uses occupational types to capture dimensions of social class (Rose & Pevalin, 2003). We make use of the three-category NS-SEC, which consists of: Higher Managerial, administrative and professional occupations; Intermediate occupations; Routine and manual occupations. More details can be found at http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2-ns-sec–rebased-on-soc2010–user-manual/index.html#5.
4. We take an average of the household income over the first four waves and divide by the square root of household size to provide a measure of equivalised permanent income. This has been shown to have a larger effect on young people's educational outcomes than transitory income (Jenkins & Schluter, 2002).

5. GCSEs are two-year courses which are taken when an individual is aged 14–16 and are considered Key Stage 4 qualifications. They are subject specific courses which are assessed by coursework, examination or a combination of both. GCSEs can be studied at both state and private schools and usually young people study between eight and ten subjects, but this varies by the school provision and the prior attainment of the students. GCSEs are important because they may determine whether a student is accepted by a sixth form or college, what subjects can be taken at A Level and they are sometimes used to assess if students are suitable for particular university courses.
6. Although A levels are the most widely held qualification among 18-year-olds accepted to university from the UK, there are other routes to university. A minority of 18-year-olds in 2016 were also accepted holding (BTECs), and a combination of A levels and BTECs (UCAS, 2016).

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