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Private school pupils' performance in GCSEs (and IGCSEs)

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ABSTRACT

Using rich longitudinal data from the UK's Millennium Cohort Study (MCS), the authors compare the performance of private and state school pupils in age 16 national examinations (GCSEs) in England, where private schools are particularly well resourced by international standards. Performance among pupils attending private secondary schools is superior. However, this raw difference ignores the highly socially selective nature of the English private school system. Adjusting for socioeconomic background, the overall performance difference between the sectors disappears. The picture is also quite different when considering English, Maths, Science and Arts subjects separately. Implications are reviewed for debate surrounding the role of private schools and the emphasis of lower secondary state education on core subjects at the expense of Arts subjects.

Introduction

Private schools in Britain have attracted considerable public interest in recent years, surrounding their roles in the education system and in society generally. While critics have pointed to the perceived unfairness of buying an unfair advantage in life through private education, and thereby restricting the potential for upward social mobility, defenders have typically defended Britain's private schools as offering diversity of education provision and academic excellence (e.g. Claughton, 2019; Verkaik, 2018). In parallel with, and helping to inform this public discourse, substantive advances have been made in investigating the choices of parents, and in estimating the academic and other effects of attending a private school (e.g. Anders et al., 2020; Ball, 1997; Dearden et al., 2002; Feinstein & Symons, 1999; Henderson et al., 2020; Sullivan & Heath, 2003; Sullivan et al., 2014). This paper concerns one of the reasons that parents spend money on sending a child to private school, namely to improve their educational attainment, given the importance of such attainment in securing access to subsequent educational opportunities and well-paying jobs in the labour market (Green et al., 2011).

The previous evidence has highlighted a small but significant educational advantage in attainment across multiple stages of schooling, as well as wider benefits (Green, 2024;

Green et al., 2020; Henderson et al., 2022). An important, insufficiently explored aspect of these prior studies, however, concerns performance in Britain's high-stakes assessments – the General Certificate of Secondary Education exams (GCSEs) – which are taken normally at age 16. The existing studies relate to schooling and assessment that took place prior to 2000, since when the comparative resources gap has grown (Sibieta, 2021). Moreover, only one of these studies of GCSE performance took sufficient account of family background, prior attainment[1] and other non-school factors (Smith-Woolley et al., 2018); yet the young people who attend private schools are highly socially selected, in the sense that, apart from a small number of bursaries, because of the very high fees access is largely determined by family income and wealth (Anders et al., 2020; Henseke et al., 2021). We know from other contexts that young people from more advantaged backgrounds perform better in high-stakes exams than their peers (e.g. Ermisch & Francesconi, 2001), regardless of whether they have attended a private school. New questions have also emerged in recent years about the differential performance between subjects, based on the increased prioritisation of performance in English, Maths and other 'core' subjects in state schools, exemplified through the introduction of the English Baccalaureate (EBacc) performance measure for state schools, as well as the decreased emphasis on Arts subjects (Anders et al., 2018; Ashton & Ashton, 2023; Maguire et al., 2019).

In this paper, we contribute new estimates of private schools' association with young people's educational attainment in different subjects in their GCSE exams during the 2010s, accounting for family background by deploying a rich, longitudinal dataset from a recent, representative birth cohort study in England.

We proceed by introducing the background to our analysis, including the institutional context of private schools in England, as well as the previous literature that has sought to identify their benefits for academic attainment. Next, we introduce the data we are using, in particular focusing on some challenges in measuring pupils' academic attainment at age 16 consistently across the state and private sectors. This also sketches out preliminary findings regarding unconditional differences in young people's performance in academic tests at age 16. We then set out our empirical methods to understand these differences, before reporting the results of this modelling. In our concluding section we consider the implications for the current discourse on the role of private schools in Britain's education system.

Background

Under 10% of young people in England attend a private school (sometimes referred to as 'independent' or, confusingly, 'public' schools) at some point in their educational careers (Green et al., 2017), making them somewhat unusual in the international context in being particularly exclusive (cf. for example, countries such as Australia with its much larger private Catholic school sector). Nevertheless, they exert an outsized influence on national life, given the disproportionate representation of those who have attended private schools in influential jobs (Green et al., 2011; Kirby, 2016; Reeves et al., 2017).

Private schools, unlike in some other countries, are almost exclusively funded through fees (there is little state-provided support, except in relation to special education needs), although this is sometimes enhanced by the institutions holding

financial endowments. Nevertheless, they are extremely well resourced, on average, with average private school fees being approximately twice the per-pupil resource provided to state schools in academic year 2020–2021 (Sibieta, 2021). These additional funds may be expected to provide additional resources, including physical facilities and staffing, to enhance the ability of young people to learn. It is also sometimes argued that the greater autonomy private schools have in how they use these resources allows them to use their resources more efficiently towards this goal, although Davies and Davies (2014) suggest there is little evidence for this.

There are other ways in which private schools are not constrained by the regulations governing state-funded schools. Half of private secondary schools are academically selective, in contrast with a rate of 5% (and highly regionally concentrated, [Anders et al., 2020]) for academic selection in the state sector. Furthermore, they can also choose to enter their pupils for a wider choice of qualifications than those which are in practice open to state schools (who are constrained by the need to perform as well as possible in official league tables). As long as such qualifications are recognised by higher education institutions, employers and, as a result, paying parents, there is little to stop private schools from choosing to use them. In particular, there has been increasing usage of International General Certificates of Secondary Education (IGCSEs), the international variant of the state-recognised General Certificates of Secondary Education (GCSEs) used in state schools at age 16. We will return to this specifically below.

Previous research (see Green, 2020, for a review) has looked at differences in performance between state and private school pupils (Dearden et al., 2002; Henderson et al., 2020; O'Donoghue et al., 1997; Sullivan et al., 2014), including at age 16 (Feinstein & Symons, 1999; Sullivan & Heath, 2003). However, many of these studies are now from quite a few years ago, during which there have been significant changes in the institutional context as discussed above. Malacova (2007) finds that pupils' value added scores between ages 14 and 16 are larger for those in private, rather than state schools. Similarly, Ndaji et al. (2017) estimate a nearly two-thirds of a grade per subject advantage for private school pupils compared to their state school peers. However, neither of these studies are able to include family background characteristics as covariates, meaning that some of these differences may be accounted for by these backgrounds, rather than private schools, per se. More recent work by Smith-Woolley et al. (2018) is able to adjust for pupils' family background and prior achievements, with the upshot being that it finds a smaller, but still positive, conditional association between private school attendance and attainment at age 16. However, it focuses only on pupils' performance in a composite of English, Maths and Sciences, rather than providing evidence on individual subjects or their full sweep of attainment.

To bring our understanding of differences in performance between state and private school pupils up to date, understand the role of family background broadly defined, and provide new evidence on variation in performance differences between subjects of study, we propose the following research questions for this paper:

RQ1: Do young people who attend private schools perform better in their age 16 end of school exams?

RQ2:   How does this differ between different subjects of study?

RQ3.   To what extent are any differences in performance associated with differences between those who attend state and private schools, in terms of their socioeconomic status, demographic characteristics, prior cognitive attainment, values and geography?

Data

To conduct our analysis, we use data from the Millennium Cohort Study (MCS) (University College London UCL Institute of Education Centre for Longitudinal Studies, 2017a, 2017b, 2017c, 2017d, 2017e, 2017f, 2018; 2021a; 2021), restricting our attention to the English sample because of differences in the education market between the constituent countries of the UK. At regular intervals the MCS follows a cohort of young people randomly sampled at their birth in 2000/2001, including interviews with, and assessment of, the children themselves, their parents, other family members and their teachers. Data are collected in sweeps conducted at ages 1, 3, 5, 7, 10, 14 and 17 (referred to as sweeps 1–7). We use data from several of these sweeps up to age 17, along with linked data from the UK Department for Education's (DfE) National Pupil Database (NPD) for supporting analysis.

Our sample is also restricted to those for whom we can identify private school attendance at age 14, and those for whom we have income measurements from at least waves 2 and 4 (ages 3 and 10). In this sample approximately 6% show private school attendance at this age, which is broadly in line with national data. Given the sampling method these respondents will have been attending a wide range of private schools, and a limitation of our analysis is that, as with almost all studies in the literature, we are unable to investigate heterogeneous effects from schools with differing levels of resources. Item non-response on all variables included in modelling other than private school attendance and family income is handled using a mean imputation strategy. Repeating our analysis using a multiple imputation by chained equations and predictive mean matching strategy (implemented using Stata's inbuilt functionality), either with or without inclusion of those missing family income data, makes no substantive difference to our findings. The longitudinal dataset includes a rich set of data on family circumstances, parental values, prior cognitive attainment, geographical identifiers and educational career.

Our outcome variables of interest are all about performance in national tests at age 16 known as General Certificates of Secondary Education (GCSEs), which most cohort members took in 2017. We planned to use linked data from the NPD as our outcome variable. However, an issue quickly became evident. Private school use of International GCSEs (IGCSEs) – a related, but distinct qualification – is widespread. However, these are not considered regulated qualifications by the DfE, and therefore they are not reported and recorded in the NPD. As a result, they also effectively cannot be entered by pupils in state schools[2] because of the severe implications this would have for their schools' performance in government accountability measures ('league tables').

There has been some debate about the comparability of performance in GCSEs and IGCSEs over the years. In particular, since reforms to GCSEs it has been questioned

whether IGCSEs are marked as severely as the reformed qualifications and are, hence, 'easier' (Thomson, 2019), although this was questioned by one major IGCSE provider (Benton, 2019). Subsequent objective analysis by the Department for Education was based on progression to individual 'A' level subjects taken at the end of upper secondary education two years later, which are common to all pupils. It found that pupils who had done the IGCSE in a subject performed on average at just a fraction of a grade lower than expected at 'A' level in that subject, as compared with those who had done the GCSE, though with some small variation between the two main exam boards (Department for Education, 2019), and some differences between subjects.

For the purposes of this paper our analysis makes the assumption that performance on GCSEs and IGCSEs are equivalent. We do this for two reasons. First, we contend that education providers and employers treat performance in GCSEs and IGCSEs as equivalent, meaning our analysis can be interpreted as differences in performance as it is perceived in future education and employment transitions, which is meaningful even if it is not quite the same thing as academic performance. Second, the only alternative (which we deem unsatisfactory) would be to make some questionable ad-hoc adjustments that could drive the findings. In any case, we return below to the discussion of any potential bias from this assumption in the discussion of the findings.

The implications of not having IGCSEs in the NPD are evident when we look directly at the distribution of the state and private school attendees' official Attainment 8 scores (see Figure 1). Contrary to widespread evidence average Attainment 8 scores among private school attendees are significantly below those of state school pupils, which is
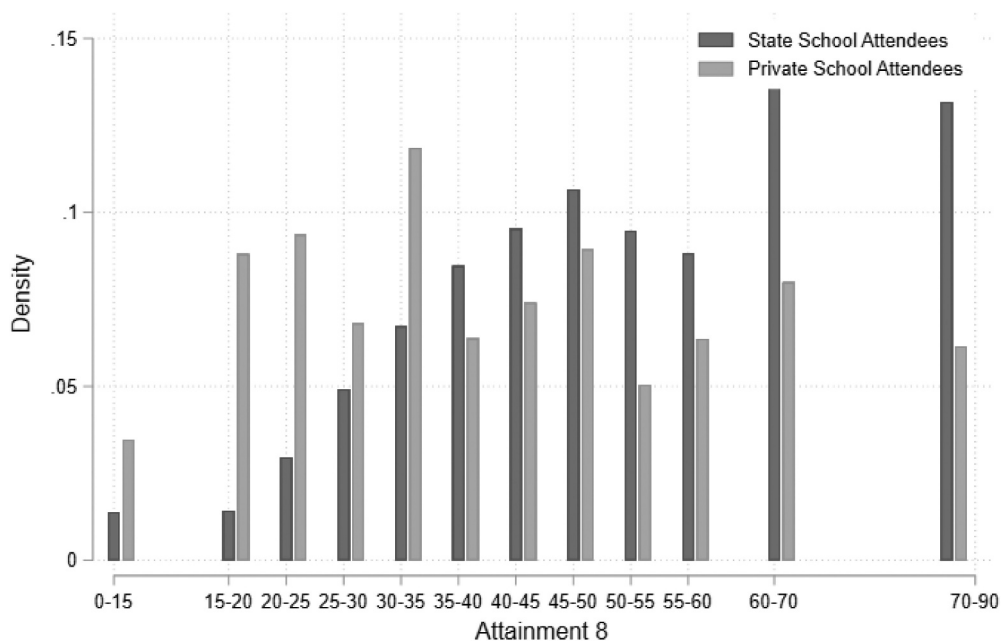

Figure 1. Distribution of pupils' Attainment 8 scores by whether or not they report attending a private school at age 14. *N* = 4,137. Categories are grouped to minimise statistical disclosure risks. Analyses are weighted to reflect sample design and non-response up to Wave 7.

driven by a large proportion of private school pupils being counted as having fewer than eight GCSEs to include in the measure.

To address this issue, given the overriding priority to ensure comparable measures between the two sectors in order to answer our research questions, we instead make use of participants' self-reported GCSEs attained.[3] As with Attainment 8, we take pupils' best eight grades (they often report more than eight, but we truncate to best eight to avoid measured performance being overwhelmed by quantity over quality, as in the case of Attainment 8), but prioritise inclusion of English and Maths qualifications in the measure and assign them double weighting. We acknowledge concerns that these could be less accurate than administrative records, for example due to recall or social desirability biases, and some residual differences in the construction of our measure from individual grades compared to Attainment 8.

Nevertheless, when directly comparing their distributions (Figure 2), we can see that the distributions are reasonably similar, albeit that the self-reported record does appear to result in some under-reporting at the lower end of the distribution and over-reporting at the upper end of the distribution. Our constructed and the official measures correlate with Pearson's correlation coefficient of 0.87.

In any case, the administrative records are not an accurate picture of the attainment of pupils in independent schools either. We judge that, while not perfect, the self-reported measure is the one that is likely to be more consistent between state and private school pupils and, hence, provide a better basis for
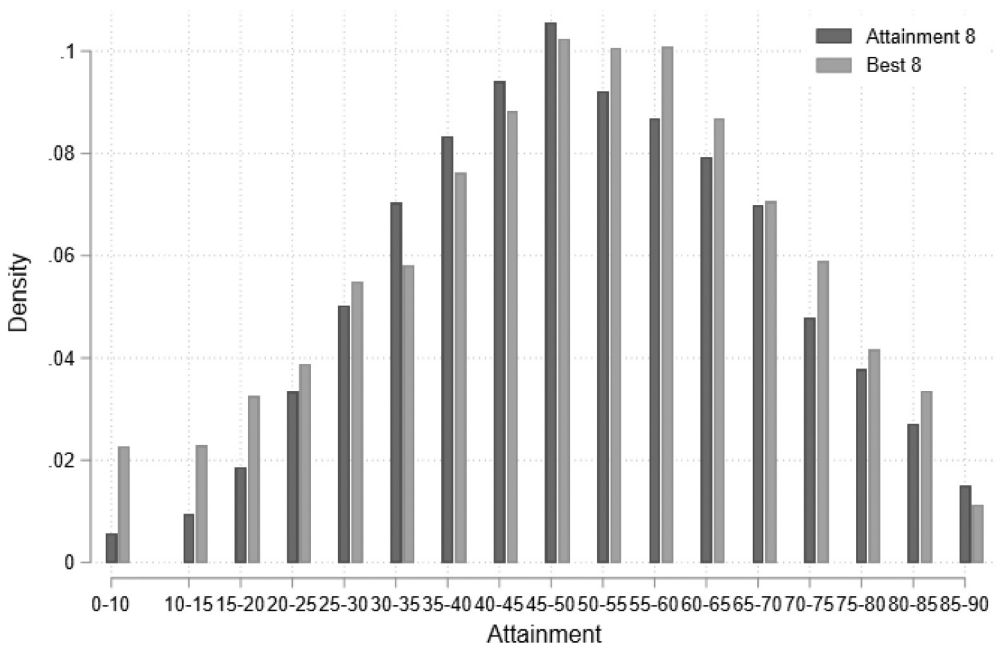

Figure 2. Distribution of pupils' Attainment 8 scores and self-reported best eight GCSE scores. $N = 4137$ for Attainment 8 scores; $N = 4,423$ for 'Best 8 GCSE Score'. Categories are grouped to minimise statistical disclosure risks. Analyses are weighted to reflect sample design and non-response up to Wave 7.

comparing and understanding differences in age 16 attainment between these two groups. Now, when we compare state and private school attendees' performance based on this self-reported measure (which we refer to as 'Best 8 GCSE Score' to distinguish it from the official Attainment 8 measure) we can see (in Figure 3) that, on average, private school pupils outperform their state school colleagues, consistent with previous evidence and expectations driven by correlations between academic attainment and socioeconomic status at other phases of the education system.

However, we want to understand to what extent these raw differences in attainment are driven by pre-existing differences in pupils' other characteristics, which may drive selection into private schooling but are not themselves affected by having attended a private secondary school. Specifically, we look at:

- Socioeconomic status: the MCS includes measures of family income (which has been equivalised by dividing by square root of family size), parental occupational status (NS-SEC), and whether or not the family owns their own home.
- Other demographics: gender and ethnicity
- Cognitive attainment tests available from Waves 2 and 5 of the MCS. KS2 attainment is also available, but is largely missing for those who attended private primary schools (who largely attend private secondary schools, too) so does not help provide a good baseline when comparing state and primary pupils, as we are here.
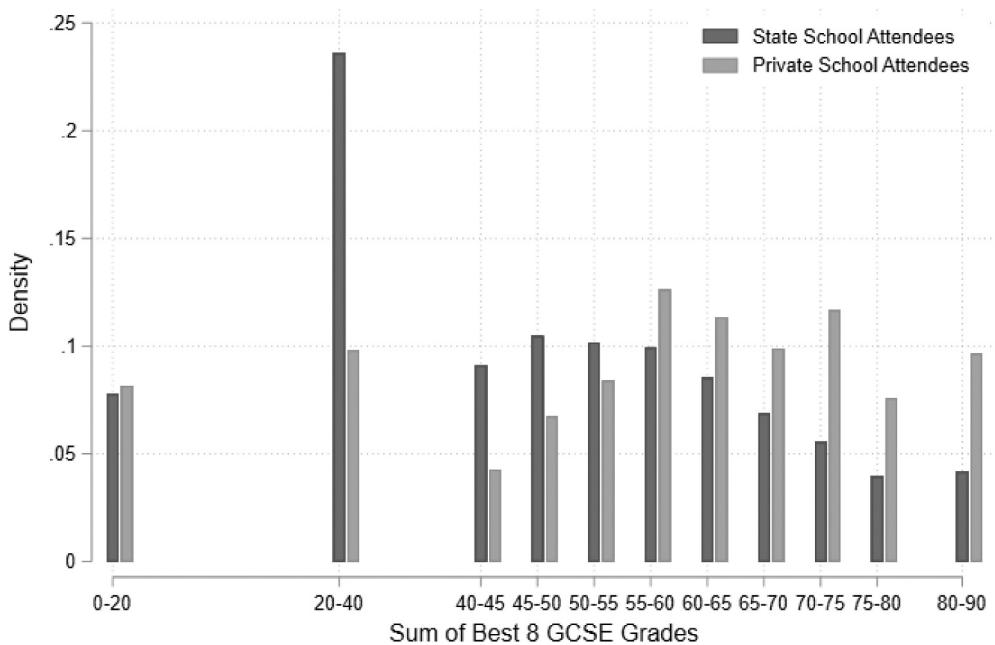

Figure 3. Distribution of pupils' 'Best 8 GCSE Scores' by whether or not they report attending a private school at age 14. *N* = 4,423. Categories are grouped to minimise statistical disclosure risks. Analyses are weighted to reflect sample design and non-response up to Wave 7.

- Values: liberal, traditional and educational values constructed using parental responses at Wave 1 using the approach set out by Anders et al. (2020)
- Geography: regions of England, and distance to the nearest primary and outstanding school (derived by Church, 2018), given the potential for this to affect sorting into state/private schools (also as documented in Anders et al., 2020)

In Table 1 we report how these characteristics differ by whether pupils attended a state or private secondary school. In terms of pupil attainment, we can see that pupils in private schools achieve a Best 8 GCSE Score of 56.5, some 8.7 points higher (corresponding to three-quarters of a grade per qualification). It certainly seems to be the case, in answer to our first research question, that young people in private schools perform better in their age 16 exams than their peers in state schools.

However, the picture is not so clear-cut in terms of attainment in individual subjects. Private school pupils do almost a quarter of a grade better in GCSE English than their state school peers, but there are only very small differences in Maths and Science qualifications (slightly worse in Maths; slightly better in Science). By contrast, among those who study for an Arts subject, they perform more than a grade better, on average, in these qualifications than those who study for one in a state school.

Turning to the wider set of characteristics, there are, unsurprisingly (Anders et al., 2020), substantial differences between those attending state and private schools. Young people in private schools on average live in homes with substantially higher equivalised weekly household incomes, have parents with higher occupational status, and performed better on cognitive attainment tests as part of the Millennium Cohort Study at ages 3 and 10.

Table 1. Analysis sample means by whether pupils attend a state or private secondary school.

Variable	State	Private	Overall	(SD)
Best 8 GCSE Score	47.84	56.51	48.35	(19.25)
Average of GCSE English grades	5.12	5.47	5.14	(1.71)
Average of GCSE Maths grade	5.11	5.01	5.10	(1.94)
Average of GCSE Science grades	4.87	4.91	4.87	(1.74)
Average of GCSE Arts grade	5.36	6.67	5.45	(1.80)
Equivalised weekly household Income	299.73	526.63	312.99	(152.96)
NS-SEC: professional/managerial	0.44	0.80	0.46	(0.50)
NS-SEC: intermediate	0.15	0.08	0.15	(0.35)
NS-SEC: small employers/self-employed	0.11	0.09	0.11	(0.32)
NS-SEC: intermediate	0.15	0.08	0.15	(0.35)
NS-SEC: (semi-)routine	0.34	0.10	0.33	(0.47)
Own house	0.64	0.93	0.66	(0.47)
Female	0.51	0.53	0.51	(0.50)
Non-white	0.83	0.82	0.83	(0.38)
Verbal sims ability score at 10 (Z-score)	0.01	0.49	0.03	(0.91)
Bracken School Readiness at 3 (Z-score)	0.00	0.50	0.03	(0.92)
British Ability Scales: Vocab at 3 (Z-score)	0.01	0.35	0.03	(0.97)
Liberal values (Z-score)	−0.01	0.04	0.00	(0.99)
Traditional values (Z-score)	−0.02	0.21	0.00	(1.00)
Educational values (Z-score)	−0.06	0.32	−0.04	(1.00)
Minutes to closest independent school	11.24	9.26	11.12	(7.33)
Minutes to closest outstanding school	10.55	11.14	10.58	(7.50)
N	**4126**	**297**	**4423**	

Analyses are weighted to reflect sample design and non-response up to Wave 7. Final column (SD) reports standard deviation.

As such, it may be the case that these differences in the characteristics and wider circumstances account for the differences in performance that we observe. We turn to linear regression in order to help us to compare pupils' performance conditional on these differences.

Empirical strategy

In order to compare pupils' performance in their GCSEs conditional on a range of explanatory factors, we use linear regression modelling. Specifically, we estimate models of the following form:

$$y_i = \alpha + \beta Private_i + \gamma' X_i + \varepsilon_i$$

Where:

- y_i is pupil is self-reported performance in their Best 8 GCSEs or, for some models, performance in a sub-set of their GCSEs (focusing on specific subjects; further details below);
- α is a constant term, which will estimate the average value of y when all other predictors are set to 0;
- *Private* is a categorical variable taking a value of 0 if pupil i attended a state school at age 14, or a value of 1 if they attended a private school at age 14, hence β recovers the estimated average difference between pupils in these two groups conditional on other covariates included in the model;
- X is a vector of covariates capturing other pupil characteristics that may affect selection into private school, but are not, themselves, affected by having attended a private secondary school. As such, they are all fixed characteristics or were measured prior to age 11, and we discuss these further below;
- ε is the error term, capturing idiosyncratic differences between an individual pupil's predicted performance and their actual performance.

Models are estimated taking into account the stratification in the MCS survey design, and allowing for non-response weighting, using the *svyset* command in Stata as recommended in the user guide.[4] This also means that standard errors are estimated taking into account clustering within the MCS primary sampling units and, hence, that statistical inference is robust to this clustering.

We consider several outcome measures to explore if there are changes in the differences in attainment depending upon GCSE subject area:

- Our overall attainment measure, as described above, is pupils' self-reported Best 8 GCSE Score, which for the purposes of interpretation we divide by 10, since it is composed of eight qualifications, two of which (English and Maths) have been double weighted, such that our estimates will report differences in the scale of a single GCSE qualification (and, thus, are also consistent with the following analyses of individual grades).[5]
- Average English grade (averaged across language and literature qualifications where the individual has taken both)

- Average Maths grade (averaged across Maths and Statistics qualifications where the individual has taken both)
- Average Science grade (averaged across any Science subjects taken: Physics, Chemistry, Biology, Computer Science and any combined science qualifications e.g. 'double-award' Science)
- Average 'Arts' grade (averaged across any Arts subjects taken including Art and Design, Dance, Drama, Theatre Studies, Performing Arts, Film Studies, Music and any combinations thereof)

When looking at each of these outcome variables, we employ a sequential modelling strategy building from an unconditional model to one adjusting for a rich set of characteristics. These are built up as follows.

M0 is our unconditional model, and provides evidence relevant to our first research question. It includes only the private school attendance predictor and, hence, allows us to recover unadjusted average differences in GCSE attainment between state and private school attendees, replicating our descriptive analysis reported above and providing inferential testing of our estimated differences.

The remaining models all help us to address our second research question. First, M1 is as M0, but adding covariates capturing pupils' socioeconomic status, specifically through 'permanent' equivalised family income (entered in a piecewise linear fashion, following Anders et al., 2019), five category family highest NS-SEC, and whether the family owns their own home (either outright or with a mortgage). Next, M2 also adds demographic characteristics for gender and ethnicity. M3 then allows us to understand differences condition on pupils' prior cognitive attainment, as measured through Bracken School Readiness and British Ability Scales vocabulary assessments from Wave 2 of the MCS when participants were aged three.

M4 takes into account differences in parental values, which may shape the educational environment provided to pupils as well as the decision whether or not to send the child to a private school (Anders et al., 2019), by adding estimated factor scores for the pupils' parents 'values scores' (as described in Anders et al., 2019) covering their liberal values, traditional values and education values. Finally, M5 adjusts for the potential importance of geography by adding geographical characteristics, specifically region of England (given the unequal geographical distribution of private schools), distance to the nearest private school, and distance to the nearest outstanding state school (since these have been shown to be linked to the decision to send a child to private school).

Results

In all of our results, we focus on the (conditional) difference in performance between state and private school pupils, as estimated by the β coefficient in the regression equations set out above. Other coefficients are not reported here since the models are designed to support interpretation of the conditional association between private school attendance and attainment, rather than any other conditional associations.

We begin by looking at overall reported performance in pupils' best eight GCSEs, reported in Table 2. As per our initial analysis, M0 estimates that private school pupils obtain 0.83 of a grade higher across each of their best eight GCSEs (8.3 grades across their

Table 2. Change in best eight GCSE performance associated with attending private secondary school.

	M0	M1	M2	M3	M4	M5
Attended private school	0.87	0.05	−0.06	−0.12	−0.16	−0.18
	(0.00)***	(0.73)	(0.69)	(0.43)	(0.30)	(0.23)
Socioeconomic status	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Prior cognitive attainment	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4420	4420	4420	4420	4420	4420
R^2	0.011	0.184	0.219	0.275	0.278	0.284
Model degrees of freedom	197	197	197	197	197	197

Note: p-values in parentheses; stars indicate statistical significance as follows: * indicates $p < 0.05$, ** to $p < 0.01$, *** to $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.

best eight, divided by 10 due to the double weighting of English and Maths). However, once we take into account socioeconomic status (M1), this difference attenuates and flips to be close to zero and statistically insignificant. Adding further covariates in the subsequent models has a cumulative further effect that strengthens the now negative relationship, although none of these estimated differences are statistically significant. Overall, it is clear that, even with quite minimal adjustment, average differences in private school performance are entirely accounted for by the socioeconomic status differences of those who attend them: there is no evidence of a private school 'effect' on pupils' performance at age 16.

Since a majority of private school pupils will also have been privately educated at the primary stage, prior cognitive attainment is likely to be correlated with socioeconomic background. As a check on the particular importance of socioeconomic status (SES) in accounting for the difference in GCSE performance, therefore, we also build up models in an alternative sequence, which swaps ordering of the introduction of covariates. Model 1 adds our prior cognitive attainment measures; Model 2 adds our demographic characteristics; and then Model 3 introduces our SES measures. From this point the models proceed in the same manner (meaning that only in Models 1 and 2 do covariates differ compared to our main approach). This alternative sequence of models is reported in Appendix 1, with the analogue to Table 2 being Appendix Table A1 (as well as analogues for the other outcome measures: Table 3 to Appendix Table A2; Table 4 to Appendix Table A3; Table 5 to Appendix Table A4; and Table 6 to Appendix Table A5). This shows

Table 3. Change in GCSE English grade associated with attending private secondary school.

	M0	M1	M2	M3	M4	M5
Attended private school	0.34	−0.17	−0.27	−0.32	−0.36	−0.38
	(0.05)	(0.33)	(0.13)	(0.08)	(0.04)*	(0.04)*
Socioeconomic Status	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Prior cognitive attainment	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4263	4263	4263	4263	4263	4263
R^2	0.002	0.121	0.174	0.215	0.219	0.226
Model degrees of freedom	197	197	197	197	197	197

Note: See Table 2.

Table 4. Change in GCSE Maths grade associated with attending private secondary school.

	M0	M1	M2	M3	M4	M5
Attended private school	−0.10	−0.66	−0.72	−0.77	−0.80	−0.84
	(0.62)	(0.00)**	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Socioeconomic status	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Prior cognitive attainment	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4148	4148	4148	4148	4148	4148
R^2	0.000	0.103	0.114	0.153	0.155	0.164
Model degrees of freedom	197	197	197	197	197	197

Note: See Table 2.

Table 5. Change in GCSE Science grade associated with attending private secondary school.

	M0	M1	M2	M3	M4	M5
Attended private school	0.05	−0.41	−0.48	−0.52	−0.54	−0.57
	(0.81)	(0.02)*	(0.01)**	(0.00)**	(0.00)**	(0.00)**
Socioeconomic status	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Prior cognitive attainment	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4043	4043	4043	4043	4043	4043
R^2	0.000	0.079	0.091	0.119	0.121	0.136
Model degrees of freedom	197	197	197	197	197	197

Note: See Table 2.

that prior cognitive attainment by private school pupils accounts on its own for about half the achievement gap; however, again, once SES is controlled for in Model 3, the private school advantage disappears. Thus, this alternative sequencing does not alter the interpretation of the findings.

Does this differ when focusing on specific subjects? Beginning with English (Table 3), we see a similar pattern to the one for overall performance. Private school pupils do an average of a third of a grade better in their English GCSE than their state school peers, although this is not statistically significant. However, this difference, if anything, reverses direction once adjustments are made for differences in pupils' characteristics, with a statistically significant negative relationship emerging once parental values are included.

Table 6. Change in GCSE performance in Arts subjects (including Art and Design, Drama/Theatre Studies and music) associated with attending private secondary school.

	M0	M1	M2	M3	M4	M5
Attended private school	1.31	0.54	0.44	0.38	0.36	0.30
	(0.00)***	(0.00)**	(0.02)*	(0.04)*	(0.05)*	(0.10)
Socioeconomic status	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Prior cognitive attainment	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	1128	1128	1128	1128	1128	1128
R^2	0.030	0.137	0.156	0.203	0.204	0.224
Model degrees of freedom	189	189	189	189	189	189

Note: See Table 2.

The pattern in Maths (Table 4) and Science (Table 5) are quite similar: the unadjusted difference in performance between state and private school pupils is negative, but not statistically significant. However, after adjusting only for parents' socioeconomic status, there are substantive and statistically significant differences in performance in favour of those attending state schools.

Things are different, however, in Arts subjects (Table 6). Here, private school pupils perform more than a grade better than state school pupils before adjustment (almost one and a third grades better on average) and, while this difference attenuates (to just under a third of a grade after including our full set of covariates), it remains in favour of private school pupils, albeit not statistically significant once we adjust for all covariates.

Conclusions

It has been well documented in many countries that the socioeconomic status of the family is an important factor behind educational inequality, affecting the educational attainment of children, and helping to dampen upward and downward social mobility. For Britain, fee-paying private schooling for a minority of around 6% of the pupil population, mainly segmented from other pupils, is a long-standing particular feature of the education system, sustained by persistent and growing wealth and income inequality (Henseke et al., 2021). An important overarching question behind the body of literature surrounding this feature is whether the private/state divide significantly adds to that educational inequality. Hitherto, studies have answered that question in the affirmative, in that private schooling, on average, is associated with cumulative educational advantage at primary and upper secondary stages, though with respect to the lower secondary stage the previous studies have been less unanimous. These findings accord with much of the public discourse which, presuming that there are normally advantages in terms of exam performance, has focused on the fairness or otherwise of the system, and on whether the schools should continue to receive tax subsidies.[6]

In this paper, we show that the overall differences in GCSE performance in 2016 between state and private school pupils are associated with differences in pupils' socioeconomic status. The pattern varies somewhat across subjects, with differences in favour of private school pupils' performance overall entirely mediated by socioeconomic status, but much smaller unconditional differences in 'core' subjects (Maths, English and Science) becoming differences in favour of state school pupils' performance once background characteristics have been accounted for. By contrast, differences in favour of private school pupils' performance in Arts subjects are more pronounced and remain in the same direction even when adjusting for background characteristics.

These findings are a contrast to, and more nuanced than previous findings. The particular focus on Maths, English and Science curricula in state schools, which has been criticised by some for being too narrow (Tambling & Bacon, 2023), appears to be reflected in these results. State school pupils appear to do better in these subjects than their private school peers, adjusting for prior attainment measures and socioeconomic status. Arguably, this represents an important achievement for state schooling given the resource gap between state and private schools (Sibieta, 2021). It may also be seen as encouraging for equalising life chances between those in state and private schools given the economic returns to mathematics, for example (Dolton & Vignoles, 2002).

It should be recalled that our findings assume equivalence between GCSEs and IGCSEs, which may not be strictly justified. It can be noted that previous studies do not take cognisance of any differences between GCSEs and IGCSEs, and of the selectivity (revealed in this paper) of the results entered into the NPD in respect of the private sector. The objective evidence – as estimated from subsequent performance at upper secondary level (Department for Education, 2019) – shows no evidence that IGCSEs are harder than GCSEs; this finding suggests that the overall performance of state school pupils is not being over-estimated in the analysis here, relative to that of private school pupils. If one were to adjust for the estimated differences in difficulty based on the DfE study, any such adjustments would be variable across subjects, and in any case relatively small. Any reasonable adjustment would therefore not alter the general conclusions of our analysis.

The fact that, by contrast, private school pupils do much better in non-core subjects arguably reflects a wider curriculum and greater available resourcing for these subjects (Ashton & Ashton, 2023). This gap is concerning for the ability of young people who attend state schools to have a level playing field with those who attend private schools in subsequent access to opportunities necessary to pursue a career in the creative sector. The gap has the potential to perpetuate, or worsen, the domination of creative sectors by those from high socioeconomic status backgrounds (Brook et al., 2020).

From the perspective of parents making schooling choices and concerned about the core subjects, these findings may appear to question whether they would receive value for money for any outlays on private schooling, given that the findings lower the expected overall cumulative attainment benefit of private schooling throughout a pupil's childhood. However, the findings do not negate the potential non-academic benefits from lower secondary private schooling; nor do they subtract from the comprehensive academic benefits that have been demonstrated at the primary and upper secondary levels. From the wider perspective of the public discourse on the role of private education in society, the findings emerge in the context of a debate that is often ideologically driven, rather than by evidence of what schools actually do or achieve in different subject areas. It is an aspiration, however, that the findings, by contributing evidence surrounding Britain's private schools' effects in the pre-pandemic twenty-first-century world, can also underpin a more rational, evidence-based public discourse than hitherto. This evidence could usefully be augmented in future to take account of the potential differential effects of the experiences of lockdown in private and state schools.

Notes

1. Controlling for prior attainment links such studies of private school performance with the literature on value added in schools, e.g. Leckie and Prior (2022).
2. For a brief period, regulated IGCSEs were available and used by state schools. However, they were never widely adopted, and recognition was withdrawn as reforms to GCSEs were completed from 2017 onwards.
3. Pupils may take other 'equivalent' qualifications at age 16, such as BTECs. We exclude these from our measure for closest comparability between state and private school performance. However, including these qualifications in our measure makes no substantive difference to our findings.
4. MCS User Guide, Surveys 1–5, 9th Edition, August 2020 (ukdataservice.ac.uk)
5. Performance in BTECs as equivalent qualifications is not included, although we have re-estimated our model including these and it makes no substantive differences to our findings.

6. The new government announced in the Autumn of 2024 that it would levy Value Added Tax on school fees from 2025.

Data availability statement

The data that support the findings of this study (the Millennium Cohort Study, MCS) are openly available from the UK Data Service (University College London UCL Institute of Education Centre for Longitudinal Studies, 2017d, 2018; 2021).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Ethics

This project was carried out under the British Educational Research Association's Ethical Guidelines and was approved through the prescribed process set out by the UCL Institute of Education Ethics Committee (REC 1001).

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Appendix. Additional regression outputs

Table A1. Change in Best 8 GCSE performance associated with attending private secondary school: alternative model sequencing.

	M0	M1	M2	M3	M4	M5
Attended private school	0.75	0.37	0.34	−0.17	−0.21	−0.23
	(0.00)***	(0.02)*	(0.03)*	(0.26)	(0.16)	(0.12)
Prior cognitive attainment	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Socioeconomic Status	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4423	4423	4423	4423	4423	4423
R^2	0.009	0.146	0.166	0.265	0.268	0.274
Model degrees of freedom	197	197	197	197	197	197

Notes: *p*-values in parentheses; stars indicate statistical significance as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.

Table A2. Change in GCSE English grade associated with attending private secondary school: alternative model sequencing.

	M0	M1	M2	M3	M4	M5
Attended private school	0.34	0.06	0.03	−0.32	−0.36	−0.38
	(0.05)	(0.76)	(0.86)	(0.08)	(0.04)*	(0.04)*
Prior cognitive attainment	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Socioeconomic Status	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4263	4263	4263	4263	4263	4263
R^2	0.002	0.099	0.138	0.215	0.219	0.226
Model degrees of freedom	197	197	197	197	197	197

Notes: *p*-values in parentheses; stars indicate statistical significance as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.

Table A3. Change in GCSE Maths grade associated with attending private secondary school: alternative model sequencing.

	M0	M1	M2	M3	M4	M5
Attended private school	−0.10	−0.39	−0.42	−0.77	−0.80	−0.84
	(0.62)	(0.07)	(0.05)	(0.00)***	(0.00)***	(0.00)***
Prior cognitive attainment	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Socioeconomic Status	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4148	4148	4148	4148	4148	4148
R^2	0.000	0.079	0.090	0.153	0.155	0.164
Model degrees of freedom	197	197	197	197	197	197

Notes: *p*-values in parentheses; stars indicate statistical significance as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.

Table A4. Change in GCSE Science grade associated with attending private secondary school: alternative model sequencing.

	M0	M1	M2	M3	M4	M5
Attended private school	0.05	−0.17	−0.20	−0.52	−0.54	−0.57
	(0.81)	(0.38)	(0.31)	(0.00)**	(0.00)**	(0.00)**
Prior cognitive attainment	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Socioeconomic status	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	4043	4043	4043	4043	4043	4043
R^2	0.000	0.062	0.069	0.119	0.121	0.136
Model degrees of freedom	197	197	197	197	197	197

Notes: p-values in parentheses; stars indicate statistical significance as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.

Table A5. Change in GCSE performance in Arts subjects (inc. Art and Design, Drama/Theatre Studies and Music) associated with attending private secondary school: alternative model sequencing.

	M0	M1	M2	M3	M4	M5
Attended private school	1.31	1.04	0.97	0.38	0.36	0.30
	(0.00)***	(0.00)***	(0.00)***	(0.04)*	(0.05)*	(0.10)
Prior cognitive attainment	No	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
Socioeconomic status	No	No	No	Yes	Yes	Yes
Values	No	No	No	No	Yes	Yes
Geography	No	No	No	No	No	Yes
N	1128	1128	1128	1128	1128	1128
R^2	0.030	0.122	0.137	0.203	0.204	0.224
Model degrees of freedom	189	189	189	189	189	189

Notes: p-values in parentheses; stars indicate statistical significance as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Analyses are weighted to account for study design and non-response up to Wave 7; statistical inference is also adjusted for the study's design.