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Private highs: Investigating university overmatch among students from elite schools

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Inequality in elite college attendance is a key driver of intergenerational mobility. This paper shifts the focus upstream to examine how elite high school attendance – specifically, enrollment in UK private, fee-paying schools – shapes university destinations across the academic ability distribution. Using linked administrative data, we show that the main advantage conferred by private schools is not that their high-achieving students are more likely to access elite degree courses, but rather that their lower-achieving students are more likely to 'overmatch' by attending more selective degree courses than might be expected given their grades. In particular, we show that lower attaining pupils from fee-paying high schools enrol in university courses around 15 percentiles higher ranked than similarly qualified state school students. The greater propensity of private school students to overmatch is driven largely by differences in application behavior, with even the weakest private school students aiming higher than their higher achieving state school peers.

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Highlights

- Recent work has highlighted significant socioeconomic “match” gaps in higher education: high socioeconomic background (SEB) individuals enrol in higher ranked degree courses than their lower SEB peers with the same qualifications.
- Using linked educational administrative data from the UK, we investigate inequalities in higher education match across different 16-18 school types.
- We find even larger match gaps than those between high- and low-SEB students in state schools, with private school students attending courses between 5 and 20 percentiles higher ranked than their state-school peers with the same qualifications.
- We explore the mechanisms behind our results and find that these differences are not driven by different subject choices but by institution attended.
- We are also able to exploit new data on application choices and find that differences in application behaviour can explain up to 75% of these gaps.
- Finally, we compare these match gaps before and at the start of the COVID-19 pandemic to analyse the impact of exam cancellations in 2020 on mismatch and find little to no impact. This adds futher support to our finding that applications are a key driver as these exam cancellations occurred *after* students had submitted their applications.

Why does this matter?

We document yet another advantage conveyed by attendance at elite, fee-paying private schools that excacerbates existing inequalities and is a barrier to improving social mobility.

Private highs: investigating university overmatch among students from elite schools

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Abstract

Inequality in elite college attendance is a key driver of intergenerational mobility. This paper shifts the focus upstream to examine how elite high school attendance - specifically, enrollment in UK private, fee-paying schools - shapes university destinations across the academic ability distribution. Using linked administrative data, we show that the main advantage conferred by private schools is not that their high-achieving students are more likely to access elite degree courses, but rather that their lower-achieving students are more likely to 'overmatch' by attending more selective degree courses than might be expected given their grades. In particular, we show that lower attaining pupils from fee-paying high schools enrol in university courses around 15 percentiles higher ranked than similarly qualified state school students. The greater propensity of private school students to overmatch is driven largely by differences in application behavior, with even the weakest private school students aiming higher than their higher achieving state school peers.

Keywords: higher education, educational economics, college choice, mismatch, private schools

JEL codes: I22, I23, I28

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1 Introduction

The university a young person attends and the subject they study can have an important and lifelong impact. Elite positions in society are dominated by alumni of the most prestigious and selective universities.[1] It is therefore unsurprising that differences in enrolment by institution (and subject in the UK) are an important mechanism through which advantages are transmitted across generations. Chetty et al. (2020) demonstrates that the majority of earnings differences between children from the top and bottom quartile of the parental income distribution can be accounted for by differences in the colleges they attend. Britton et al. (2019) shows that subject and institution of degree is responsible for around half of earnings differences among those from richer and poorer families in the UK, despite the UK college access system being more egalitarian at face value.

While much attention has been paid to the consequences of attending selective universities and courses in terms of future income and employment prospects, relatively less is known about the pathways that lead students there in the first place. Chetty et al. (2020) show that for the most selective elite private colleges, prior attainment is key to access. Widening participation to these colleges is therefore challenging since children from low-income families typically lack sufficiently high SAT/ACT scores required for entry. On the other hand, their work shows evidence of 'undermatch' at colleges outside the most selective; at any given level of SAT/ACT scores, children from higher-income families attend more selective colleges than their disadvantaged peers. Studies have pointed to family wealth and being from a highly educated neighborhood as factors that make students less likely to be undermatched and likely to be overmatched (Hoxby and Avery, 2012; Dillon and Smith, 2017).

This paper shifts the focus upstream to investigate one determinant of selective college attendance: the role of elite high schools. In the UK, students from fee-paying private schools make up only 7% of the student body at age 16, yet elite positions in society (such as senior judges and civil servants) are dominated by their alumni (Hecht et al., 2020). These elite schools are also known to bestow important advantages on their students, such as enhanced academic preparation, advice on future pathways, and increased social capital (Cattan et al., 2022), hence they may play a significant role in perpetuating educational and economic inequalities across generations (Macmillan et al., 2015). Understanding the role elite high schools play in promoting access to selective universities can therefore help us understand how educational inequalities are produced and reproduced, not only at the level of college access, but earlier in the educational pipeline.

In this paper we provide new evidence on the role of elite school types in propagating disadvantage gaps in university enrolment. Using the mismatch framework developed

[1] In the UK 6% of the population attended the elite Russell Group of Universities and 1% attended Oxford and Cambridge. Alumni of these institutions have been calculated to make up 49% and 24% of those in elite occupations in the UK (Sutton Trust, 2019).

by Campbell et al. (2022), we document the extent to which students from private and academically selective state schools are more likely to 'overmatch' (attend better ranked university courses than might be expected, given their grades) and less likely to 'undermatch' (the reverse) throughout the prior attainment distribution, compared to their state school peers.

Our context is unique in that unlike the US, students do not face differential fees across institutions, and we do not have legacy enrolement policies (Chetty et al., 2020; Cattan et al., 2022). Despite this, recent evidence indicates that mismatch is widespread in both the UK and US, and that undermatch is more common among students from disadvantaged backgrounds (Campbell et al., 2022; Dillon and Smith, 2017).[2] Campbell et al. (2022) show that the majority of the difference in matching behaviour between SES groups is explained by differences between schools. Dillon and Smith (2017) find that being from a high school where many students go on to college makes students less likely to undermatch and more likely to overmatch. By focusing here explicitly on differences in mismatch by school type, we can start to unpack these findings.

We split schools into four types for our analysis: private, grammar, state, and further education (FE). Private schools are independent, fee-paying schools attended by around 7% of secondary school students, a figure which rises to 18% among those taking A-levels[3] (Green, 2024). With average fees of over GBP 15,000 a year in 2023, these are attended by the most socio-economically advantaged students, on average, although the sector caters for a spread of abilities (Sibieta, 2023). Grammar schools are selective state schools, that are free to attend but select students based on a test at the end of primary school, the "11+". The requirement to pass this rigorous entry exam means that grammar schools' academic performance rivals that of the highest-achieving private schools - indeed these schools are sometimes seen as 'free substitutes for private schools' for those who meet the ability threshold criteria. Unsurprisingly, there is substantial competition for grammar school places, and private tutoring for the test is widespread. These schools were mostly abolished between the mid 1960s and mid 1970s, and hence only 9% of our sample of university attendees attend grammar schools. These are concentrated in particular local areas (see Section 2.1 for more details). The largest group in our sample are state schools, which includes all state-funded, non-selective schools, attended by 57% of university attendees. Finally, we also separate out further education (FE) colleges which offer a combination of academic and vocational courses post-16, their graduates

[2] A recent literature, (Dillon and Smith, 2020; Arcidiacono et al., 2016) suggests that college and student quality are complementary, implying that a perfect positive match between student ability and course quality would be efficient. This implies that a reallocation of college places across those from different school types could have benefits in terms of both equity and efficiency.

[3] A-levels are the traditional, academic post-16 (level 3) qualification leading to university enrolment. Students are able to enrol in university after studying equivalent level 3 qualifications such as BTECs but the majority take A-levels (60% of applicants in 2017 held (or would hold) only A-level qualifications at level 3, UCAS, 2019).

make up 22% of university attendees.

We follow methods pioneered by Campbell et al. (2022) to create our measure of match. Specifically, we rank students nationally based on their performance in A-levels, which are the high-stakes exams necessary for college entry, taken at age 18. We also rank university-subject pairs or "courses" by their median student's A-level score.[4] Our measure of (mis)match is obtained by taking the difference between the percentile ranking of the student and the degree. We then compare (mis)match across pupils from different school types — private, grammar, state and FE — throughout the prior attainment distribution. Thus, we go beyond merely looking at students at the top of the ability distribution (Hoxby and Avery, 2012), and colleges at the top of the quality distribution, to focus on gaps in match by these schooltypes across the entire ability-quality distribution.

Our results show that students from private schools and grammar schools are more likely to overmatch, and less likely to undermatch than similarly achieving pupils from 'regular' state schools and FE colleges. Much of the advantage enjoyed by grammar-school pupils compared to those attending other state provision can be explained by earlier achievement, but this is not the case for private-school pupils; they attend much better ranked university courses than than their peers of similar measured ability across the entire distribution. Perhaps surprisingly, the greatest disparities in mismatch between state and private school pupils occurs in the bottom half of the ability-quality distribution rather than at the very top. Among the highest achievers, private-school students enrol in courses around 5 percentiles higher ranked than those from other school types. But among those from the 3rd-5th decile of attainment, private-school pupils enrol in courses as much as 15 percentiles higher than students from other school types.

The private school advantage, in terms of accessing better-ranked university courses, is to date undocumented and unexplored in the literature, and is a key new finding of this paper. This paper makes several further contributions to the mismatch literature. Our detailed adminstrative data allows us to understand the ways through which this private school advantage occurs. Our analysis is the first to demonstrate that this is mainly driven by differences in the application behaviour of those coming from different school types. UK students make up to five applications to university-major combinations through a centralised applications service. Looking at the range of applications made gives us a unique insight into the application strategies employed by young people from different school types. We see that young people who attend private schools are much more ambitious in their applications, particularly among their 'safety' or lower-ranked applications. This may be down to greater confidence (Terrier et al., 2023), less risk aversion, or it may be that they are better informed about the most fruitful applications

[4]The latter sets us apart from much of the mismatch literature, which looks purely at mismatch by institution. Students in the UK choose their major before enrolling in university, making this approach possible in the UK context

strategies to make.

We are also able to disentangle institution choice from subject choice in our setting. Our analysis indicates that this private school advantage is driven by differences in the higher education institutions that students from different school types attend, rather than by the subjects they choose. This is in line with the results for socio-economic gaps observed in Campbell et al. (2022).

Finally, by examining enrolment patterns of pupils from elite schools compared to other school types (particularly grammar schools) we make a further contribution by discussing the potential role of pupil, parent, and institutional factors in driving this increased propensity to overmatch (and reduced likeliness to undermatch). At the pupil level, the disparities appear to be linked to greater confidence, lower risk aversion, and stronger financial safety nets among private-school students. Parental strategy and school-level resources also play a role, with private institutions offering superior guidance and support throughout the application process. Even after controlling for application behaviour, private-school pupils enjoy higher acceptance rates, suggesting possible institutional preferences although difference in other aspects of applications, such as predicted grades and personal statements, make this harder to draw conclusions about.

The paper proceeds as follows. In section 2 we explain the institutional background, and section 3 covers the datasets used in this analysis and the methods we employ. In section 4 we present results. We explore the role of institutions, subjects and applications in generating these results in section 5. Section 6 concludes.

2 Background

2.1 Institutional setting

We analyse inequalities in match in higher education in the UK. The structure of the UK education system means that students make a number of crucial subject and qualification decisions as early as age 13 or 14.

Pre-university qualifications. At the age of 13 or 14, students choose the type of qualifications and, crucially, the subjects that they will study in their final two years of compulsory schooling, most often for 10 subject-specific General Certificates of Secondary Education (GCSEs). Those who stay on after the end of compulsory schooling at 16 face another set of important decisions regarding their qualification and subject choices from age 16 to 18, the most common choice among those planning to attend university is Advanced Level qualifications (A-Levels) in three subjects.

University applications. Students wanting to study for bachelor's degrees have to choose an institution-subject pair, which is generally referred to as a "course". In a normal year, students apply to a maximum of 5 courses around a year before entry, through a centralised clearing house called UCAS. Typically, students apply to one subject at a range of institutions. As they have not yet sat their final exams, they apply on the basis of teacher predicted grades, which they submit alongside a personal statement with their applications. They then receive offers which are conditional on their achieving certain grades in the exams. They must accept a preferred ("firm") and "insurance" offer before they sit the exams which will determine which course they enrol on. Universities are legally obliged to accept the student if they meet the offer, and the student generally enrols on their firm or insurance choice dependent on their grades.[5] This system creates a significant amount of uncertainty for both students and universities, as students effectively apply to and choose a university without knowing whether they will actually secure a place. Similarly, universities make offers "blind", without knowing if a student will get the grades to achieve their offer, let alone if they will decide to accept it. In particular, restricting students to only five choices (and then narrowing them to two) when they do not know their final grades introduces a lot of risk into the process, risk which students from different school types may react to very differently.

2.2 School types

Private schools. English private schools are socially exclusive and expensive. Three-quarters of the children at private schools are drawn from families in the top three income deciles, and most of these from the richest decile (Henseke et al., 2021). In 2022-2023 average private school fees were GBP 15,200 per year, having risen by 20% in real terms since 2000 (Sibieta, 2023), this is almost half of median household income (Office for National Statistics). High private school fees combined with stagnating state school funding means that private-school pupils have 90% more resources dedicated to their education (Sibieta, 2023) and experience pupil teacher ratios that are half the level in the state sector (Green, 2024). As shown in table 1, 11% of the students in our sample attended private school, and average over a grade higher per entry at GCSE than their state-educated peers, and nearly 3 grades higher overall at A-level. Henderson et al. (2020) find no additional advantage of private schooling in access to elite (Russell Group) universities beyond that conferred by students' A-level subjects and results. However, our ranking of university courses based on average grade allows us to rank university quality with more nuance than this simple binary definition.

[5]There is another round of student-course matching post results known as "clearing", which is aimed and marketed at those students who miss their firm and insurance offers. However, it is also possible for students to enter clearing having made their offer(s). In 2019, 73% of accepted applicants enrolled on their firm choice, 10% on their insurance choice, and 13% were placed through clearing.

Grammar schools. Nine percent of the individuals in our sample are attending a grammar school when they take their A levels. Grammar schools, which are academically selective state funded schools, are highly concentrated in some areas of England, and 75% of English education authorities do not contain any grammar schools (Danechi, 2020). The pupils who attend grammar schools are much less disadvantaged than the population of pupils in their area, with only 3% of grammar school pupils eligible for free schools meals in 2016, compared to 17% in areas with grammar schools (Sibieta, 2016). This is expected as grammar schools are academically selective, and disadvantaged children have weaker results at age 11. However, grammar schools also include fewer disadvantaged pupils even among those with the same school attainment at age 11 (Burgess et al., 2018).

While attending a grammar school has educational benefits for the marginal child (Clark and Del Bono, 2016; Clark, 2010), those in grammar school areas who do not attend these schools do worse than expected (Atkinson et al., 2006). Combined, these facts have led to researchers concluding that grammar schools, as they currently exist, serve to increase educational inequality in school attainment (Sibieta, 2016; Buscha et al., 2023). Indeed, Burgess et al. (2020) finds a substantial relationship between earnings inequality and selective schooling arrangements in the local area. It is possible that university course attendance contributes to this inequality; this is the first study to assess this potential mechanism in detail.

Sibieta (2017) shows that 12% of year seven pupils in grammar schools were not in the state system in the previous year. This implies that children move from private schools into grammar schools at age 11, suggesting that grammar schools are seen by some parents as a substitute for private schools. However, there is a sharp difference in funding, as grammar schools received less funding than other state schools during our sample period. This is for a variety of reasons, but primarily because disadvantaged students receive a greater allocation, and grammar schools include fewer of these types of students (Panjwani, 2018).

Further education (FE) colleges. Further education colleges offer both academic and vocational education for those aged 16-19. They are larger (particularly after recent mergers) than other types of state sixth form provision and their funding is generally higher per student. This is due to a combination of the more expensive vocational qualifications that they teach and the more disadvantaged students they serve (Drayton et al., 2025).

State schools. State provision not described above comprises 11-18 comprehensive schools which offer A-level study and Sixth Form colleges which offer only A-levels to 16-18 year olds. Historically, which option is available in the local area depends upon the size and social mix of local schools. Sixth Form colleges were created where there

were judged to be insufficient pupils in individual schools to make the provision of A level study in each school feasible and efficient. However, the switch to running schools as autonomous academies (Eyles et al., 2016) may have led school sixth forms to increase in popularity (Wilby, 2016), by their nature, academies lead to less coordination of provision at local level. In addition, funding pressures have led Government to encourage mergers between state Sixth Form and Further Education Colleges. According to the Association of Colleges, 82 college-to-college mergers occurred between 2015 and 2024, with 54 of these occurring before 2019. This means that some of the students that we classify as in Further Education Colleges would have been in colleges that shifted to this category very recently.

3 Data and methods

3.1 Data

We use individual-level administrative data on the population of state and independent school students in England, from two different datasets: the National Pupil Dataset linked to the Higher Education Statistics Authority dataset (NPD-HESA) and the Grading and Admissions Dataset for England (GRADE). Our main sample is from NPD-HESA and includes all students who took A-level exams or equivalents in England in summer 2019, and who then enrolled in university in autumn of that year, aged 18 (the traditional age for university entry in England). Students who applied (and were accepted) to university in 2019 but who did not enrol are excluded, meaning students taking a gap year are not in our analysis sample.

The NPD covers our sample members up to their A-levels (or equivalents), and includes basic demographic information — gender, ethnicity, English as an additional language (EAL), special educational needs (SEN) status — alongside externally set and marked exam results at ages 11 (SATs), 16 (GCSEs), and 18 (A-levels).[6] As our focus is the subset of these students who go on to university, we then restrict our sample to students for whom we have information on exam results at age 18 in academic year 2018/2019 and who enrolled in university in 2019, giving a final sample of 184,070.

We use HESA data to identify which students enrolled in university in 2019, the autumn after the cohort takes their A-levels (i.e. in the same calendar year). These data contain information on every student in every higher education establishment in the UK, including the subject (major) of their degree. Our main estimates use a 23 subject classification to distinguish courses within institutions. This classification distinguishes

[6]There is significantly less data available for pupils in independent schools, as these are not required to complete the schools census (the source of ethnicity, EAL and SEN data) and independent school pupils do not sit SATs.

Table 1: Sample summary statistics by school type (2018/2019)

School type	**Private**	**Grammar**	**State**	**FE**
Female	10,500 (50%)	9,225 (53%)	58,740 (56%)	24,815 (60%)
Ethnicity				
Other	- (-%)	245 (1%)	2410 (3%)	20 (5%)
Asian	- (-%)	3415 (20%)	15300 (16%)	80 (22%)
Black	- (-%)	985 (6%)	7630 (8%)	55 (16%)
Chinese	- (-%)	345 (2%)	680 (1%)	0 (0%)
Mixed	- (-%)	970 (6%)	4845 (5%)	25 (7%)
Unclassified	- (-%)	220 (1%)	1465 (2%)	20 (6%)
White	- (-%)	10825 (64%)	60870 (65%)	150 (43%)
FSM eligible	- (-%)	405 (2%)	6890 (7%)	30 (9%)
SEN status				
No SEN	- (-%)	16165 (95%)	89070 (96%)	325 (94%)
SEN w/o statement	- (-%)	805 (5%)	3680 (4%)	15 (5%)
SEN w/ statement	- (-%)	35 (0%)	450 (0%)	0 (1%)
Unclear	- (-%)	0 (0%)	0 (0%)	10 (1%)
Language				
English	- (-%)	14375 (85%)	72750 (78%)	245 (71%)
Other	- (-%)	2575 (15%)	19920 (21%)	95 (27%)
Unclassified	- (-%)	55 (0%)	530 (1%)	10 (3%)
Avg. pts per GCSE	6.91 (1.46)	6.94 (1.11)	5.77 (1.26)	5.66 (1.27)
Total KS5 pts	139 (51)	141 (49)	107 (43)	98 (47)
Attainment decile				
1 *(lowest)*	895 (4.2%)	555 (3.2%)	10,015 (9.6%)	7,160 (17.4%)
2	1,070 (5.1%)	820 (4.7%)	12,190 (11.7%)	5,030 (12.3%)
3	1,010 (4.8%)	755 (4.4%)	11,510 (11.0%)	4,425 (10.8%)
4	2,180 (10.3%)	1,780 (10.3%)	17,350 (16.6%)	6,190 (15.1%)
5	1,495 (7.1%)	1,210 (7.0%)	10,245 (9.8%)	3,480 (8.5%)
6	1,460 (6.9%)	1,385 (8.0%)	9,290 (8.9%)	3,150 (7.7%)
7	1,805 (8.6%)	1,590 (9.2%)	8,225 (7.9%)	2,845 (6.9%)
8	3,455 (16.4%)	2,675 (15.5%)	11,820 (11.3%)	4,005 (9.8%)
9	2,990 (14.2%)	2,365 (13.7%)	6,985 (6.7%)	2,370 (5.8%)
10 *(highest)*	4,710 (22.4%)	4,145 (24.0%)	6,965 (6.7%)	2,385 (5.8%)
N	21,075 (11%)	17,285 (9%)	104,590 (57%)	41,035 (22%)

Source: NPD-HESA.

Notes: For all categorical variables the count per value is displayed (with the share as a percentage in parentheses); for continuous variables, the mean is displayed (with the standard deviation in parentheses). The majority of the private school pupil are missing data on background characteristics.

"Medicine & Dentistry" from "Nursing", and "Economics" is separately classified from other Social Science disciplines.[7]

Applications. In section 5, we explore potential mechanisms that might be driving mismatch, one of which is application behaviour. For this we use data on where students applied to university, from the Universities and Colleges Admissions Service (UCAS), the charity which oversees undergraduate university admissions in the UK. This data has been linked to the NPD and data on qualifications from Ofqual (the qualifications regulator) in a new dataset known as GRADE (ofqual et al., 2024). The data used in this section is therefore slightly different to NPD-HESA linked dataset described above and used in the rest of the paper. The key difference is that the 2019 UCAS data only includes 18-year-olds in English schools applying in 2019,[8] whereas 2019 HESA data covers all students enrolled in UK universities in 2019. We have also restricted our sample to include only applicants who make 4 or 5 UCAS choices,[9] to ensure that our ranking of students' choices is consistent across students. As students do not rank their application choices when applying, we rank students' application choices using the same metric we use to calculate the course ranking for mismatch (see subsection 3.2). It is unclear how we should rank the choices of students who make one, two or three choices relative to those making four or five. As the majority (nearly 92%) make 4 or 5 choices, we drop the other 8% from our sample for this part of the analysis. In practice our GRADE and NPD-HESA samples are very similar, and we show that we can very closely replicate our main findings using GRADE in appendix A.

3.2 Measuring student-degree (mis)match

We are interested in the match between student and degree. We rank students according to their A-level results. We rank degrees based on the median achievement of students on each degree in 2019.

Our match measure is calculated in three steps, following Campbell et al. (2022):

1. Calculate student percentile: we rank individuals in the distribution of age-18 achievement based on their performance in their Key Stage 5 (KS5, A-level or

[7]The 23 subjects are: "Agriculture & Related Subjects", "Architecture, Building & Planning", "Biological Sciences (excluding Psychology)", "Business & Administrative Studies", "Combined", "Computer Science", "Creative Arts & Design", "Economics", "Education", "Engineering & Technology", "English Studies", "Historical & Philosophical Studies", "Languages (excluding English Studies)", "Law", "Mass Communications & Documentation ", "Mathematical Sciences", "Medicine & Dentistry", "Nursing", "Physical Sciences", "Psychology", "Social Studies (excluding Economics)", "Subjects Allied to Medicine (excluding Nursing)", and "Veterinary Science".

[8]We also do not observe whether a student actually enrols in a university in the UCAS data, although we do see where they were finally placed at the end of the UCAS applications process.

[9]Students can make a maximum of 5 UCAS applications in any application cycle.

equivalent) exams.[10]

2. Calculate course percentile: we rank each university-subject combination in a distribution of course quality, based on the median student's total KS5 points.

3. Calculate match, M_i: We subtract the student's percentile in the KS5 points distribution from the percentile of their course in our course ranking.

$$M_i \equiv \textit{course percentile}_i - \textit{student percentile}_i \tag{1}$$

We therefore have a continuous measure of (mis)match for each student. The continuous nature of our outcome allows us to analyse inequalities across the severity of mismatch, rather than relying on arbitrary thresholds (such as $\pm$ 20%) to categorise students as matched or not. The measure represents the distance of each student's chosen course from their position in the achievement distribution. Thus, a student at the 50th percentile of the GCSE distribution would be considered matched if they are enrolled on a course at the median of the quality distribution. If a student attends a course at a lower percentile than their own percentile in the student quality distribution, we consider them undermatched. If they attend a course which ranks above their position in the student quality distribution, we consider them overmatched.

3.3 Empirical methods

To understand the nature of student matching we use two distinct methods to present the results. First, we show a plot of students' achievement decile against average degree quality for all students in that decile, for each cohort. If all students were perfectly matched to their degrees this line would be straight and at a 45-degree angle.[11] The vertical distance between each point and the 45-degree line indicates how overmatched these students are on average, and similarly the distance below the 45-degree line reveals the extent of undermatch. It imposes minimal assumptions beyond those involved in the creation of the metrics. Plotting this match-line for students from different types of school allows us to study inequalities in match across the achievement distribution.

Second we estimate school-type gaps in match, conditional on individual characteristics and prior achievement at age 16 (GCSEs). Specifically, we estimate the following

[10] We consider only the students who go on to university, so the relevant exam results distribution is that of university attendees. Some students take other qualifications that are official equivalents to A-levels. The Department for Education has created points scores to allow comparisons. We use the total points achieved from A-levels or equivalents, variable `KS5_TOTPTSE` in the NPD.

[11] This is feasible, although it would require there to be no variation in student quality within a degree. For example, the courses at the top percentile of the quality distribution would need all their students to be from the top percentile. There is evidence of near perfect matching in our data; for the top-ranked degree of Maths at Cambridge more than half of the 92 students enrolled have 'best 3' A-grades in either Physics, Maths, Further Maths, or in Chemistry, Physics, Further Maths.

regressions:

$$M_{ia} = \beta_0 + \sum_{j \in J} \beta_j \mathbb{1}_{\{D_i = j\}} + \gamma female_{ia} + \delta X_{ia} + \pi P_{ia} + \varepsilon_{ia}, \Delta a, \tag{2}$$

where M_{ia} is our measure of match, $\hat{\beta}_j$ represents the estimated school type gap in match relative to the reference group,[12] and $\hat{\gamma}$ is the estimated gender gap in match, conditional on background characteristics, X_{ia}, and prior achievement at 16, P_{ia}.

4 Results

Figure 1 shows the distribution of our measure of mismatch. The first thing to notice is that private-school students experience less undermatch; the solid line is to the right of the other lines. Grammar-school pupils are more likely to be well matched than state-school students, while those attending Further Education Colleges are the most likely to undermatch. The story about overmatching is a little more nuanced. At moderate levels of overmatch there are only small differences by school type, with Further Education students slightly more likely to fall into this bracket. But this pattern reverses once we consider students who are 50 percentiles higher in the course quality distribution than we would expect based on their A-level results, the probability of being included in this small group is higher for private-school students.

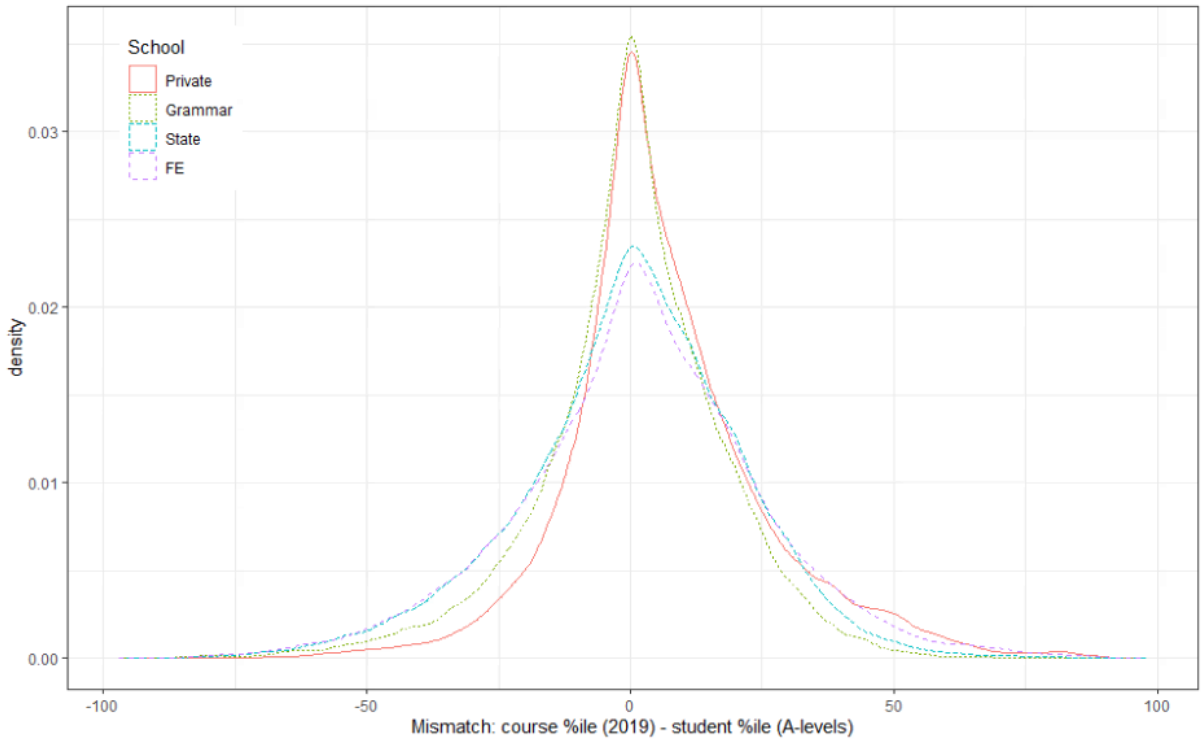
4.1 Inequalities in match gaps

Figure 2 plots our degree-quality measures against student achievement for each school type illustrating raw gaps in match across the achievement distribution. In all cases we see that the relationship is approximately linear and is flatter than 45 degrees, meaning that low-attainers are more likely to overmatch and high-attainers are more likely to undermatch (reflecting floor and ceiling effects).

It is clear that students from independent schools attend higher-ranked degrees than those from state schools and further-education (FE) colleges at every decile of the attainment distribution, with the gaps being substantially wider than found between low and high SES pupils in Campbell et al. (2022). Students from private schools are overmatching at all ability deciles apart from at the very top (where it is mechanically impossible to overmatch). This finding suggests independent school pupils have a marked advantage in accessing higher-ranked courses than their state school and FE counterparts with the same A-level grades. The gap between those attending private schools and others is particularly substantial in deciles 2-4 of the age 18 attainment distribution, indicating

[12] For school type, we set private school as the reference group, so $J = \{\text{grammar, state, FE}\}$.

Figure 1: Distribution of academic-based student-degree match by school type

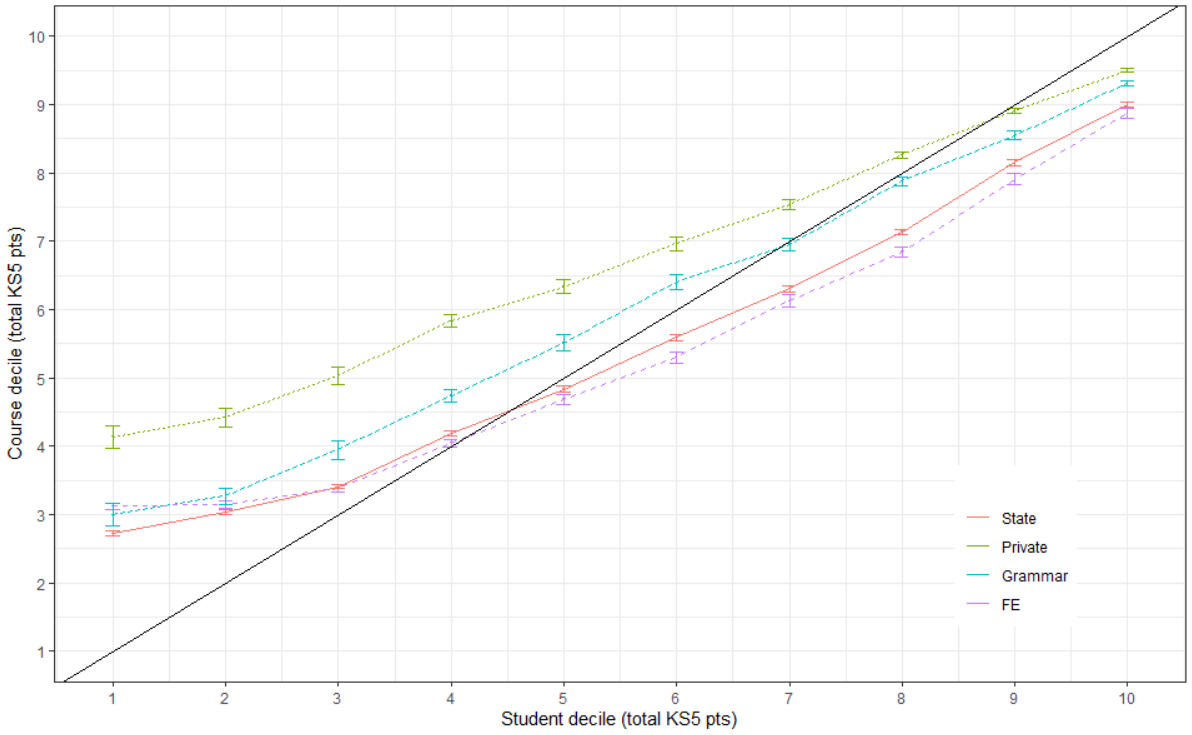


	All	Private	Grammar	State	FE
Matched	70.2%	75.7%	78.8%	69.4%	65.9%
Overmatched (≥ 20 pctiles)	16.1%	18.7%	10.8%	15.5%	18.7%
Undermatched (≤ -20 pctiles)	13.6%	5.6%	10.3%	15.1%	15.4%

Source: NPD-HESA.

Notes: $N = 21,075$ (Private school); $N = 17,825$ (Grammar school); $N = 104,590$ (State school); $N = 41,035$ (Further Education college). Academic-based match defined by degrees' median student achievement (KS5 total points) percentile minus student's achievement percentile. Students enrolled in university in 2019.

Figure 2: School type match by student achievement and course quality decile



Source: NPD-HESA.

Notes: See table 1 for counts. The 45-degree line represents perfect matching throughout the achievement distribution. Students are ranked by their total Key Stage 5 points (A-levels and equivalents, variable `KS5_TOTPTSE` in the NPD). Courses are ranked by the median student's total KS5 points. Points represent the mean course decile for students at each school type (colour) and at each decile of achievement (x-axis). Error bars represent 95% confidence intervals.

that lower-performing A-level students particularly benefit from the advantages of private schooling for university entry.

Figure 2 also shows revealing patterns for other school types. Grammar school pupils are more likely to overmatch than state school and FE college students, and this is especially true for those in the middle of the achievement distribution (4th to 6th deciles). Results for students at FE Colleges indicate they are more likely to undermatch, and this is especially pronounced for those with A-level results above the median. In fact, state and FE students are undermatched on average from the 5th decile onwards, whereas grammar school students are overmatched until the 7th decile, and private-school students until the 9th decile.

4.2 Conditional match gaps

Figure 3 panel (a) presents estimates of the match gaps at age 16 across the distribution of achievement, for each school type compared to private-school pupils (i.e. the vertical gaps between the lines in figure 2). Each point represents a separate regression for each achievement decile, estimating the model in equation 2 plotting the match gap between private-school pupils and each other type. Panel (b) shows the same coefficients conditional on student characteristics and prior achievement.

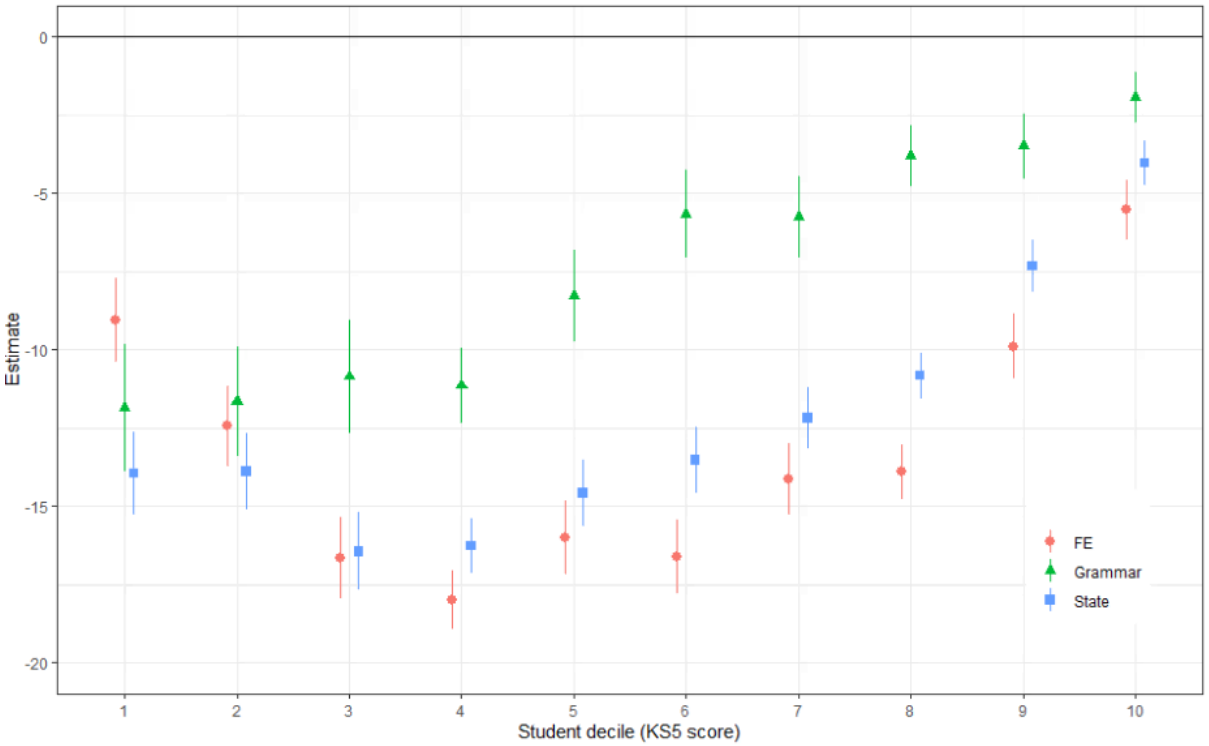
Panel (a) indicates that private-school pupils tend to match with better ranked courses than those who attended all other school types (apart from at the very highest and lowest achievement deciles). Grammar school pupils do worse than private-school pupils but much better than other state school types – for example those in the 6th decile will on average be matched to courses six percentiles lower than those who went to private schools but 7 percentiles better than those who attended standard state schools. Differences between state and FE colleges are smaller, but as we saw before there is evidence that those in the upper deciles at FE colleges match to lower quality courses than those from other non-selective state provision.

Conditioning on prior attainment in panel (b) demonstrates how much of the differential performance of those from different school types can be explained by prior attainment and individual characteristics.[13] Two differences stand out when comparing panels (a) and (b): the first is a reduction of the size of the coefficients for non-selective state education, indicating that GCSE results are relatively weaker in these schools and this explains some of their poorer matching outcomes. However, these coefficients are still substantial and widest in the 2nd to 5th deciles of attainment, where independent school pupils attend courses that are around 12 percentiles higher ranked than state school pupils with the same A-level points. The other striking finding is that the grammar school coefficients change little in absolute magnitude (and even increase), meaning that the advantage over

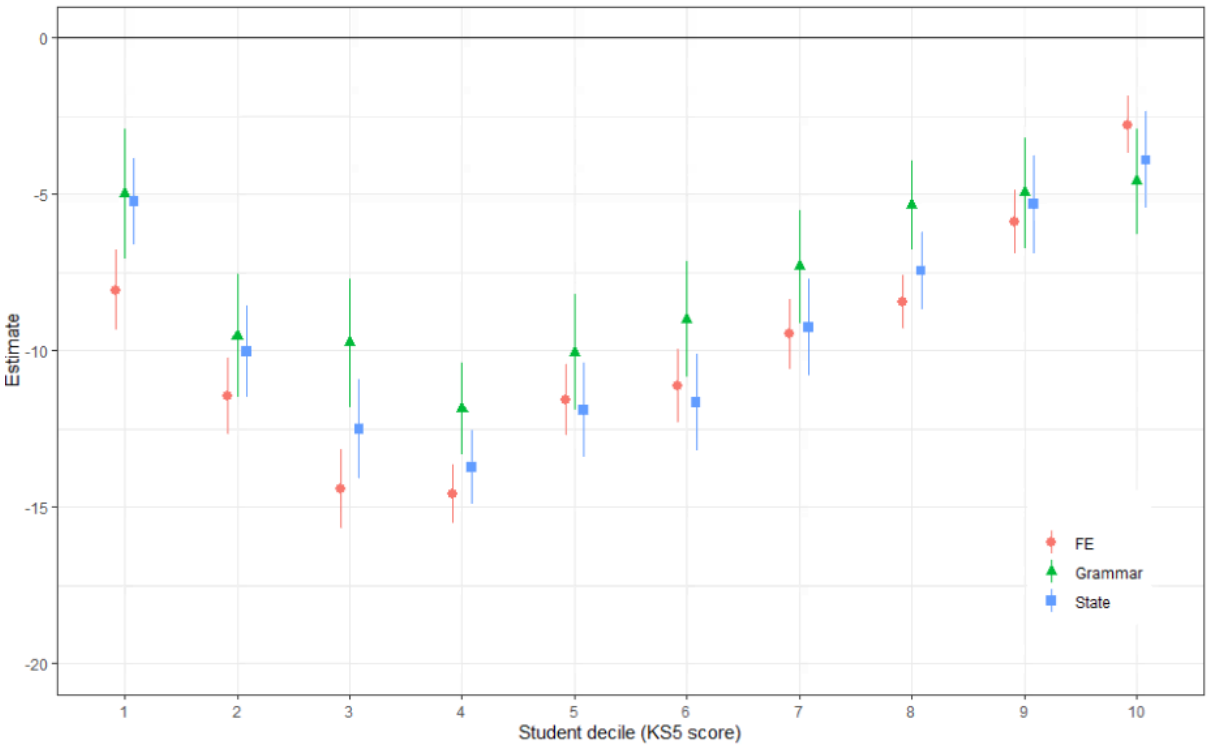
[13]Note that ethnicity, SEN and EAL are mostly unavailable for private schools so the conditioning of these gaps is mostly driven by prior attainment.

Figure 3: Conditional school type match gaps by student achievement decile (ref. private)

(a) Raw gap



(b) + prior attainment and other characteristics



Source: NPD-HESA.

Notes: For counts, see table 1. The points are estimates of β_j in equation (2), for the private-state gap (blue squares), the private-FE gap (green circles), and the private-grammar gap (red triangles), with extending vertical lines 95% confidence intervals. (b) Controls are gender, prior attainment (GCSE), ethnicity, special educational needs (SEN) status, and English as an additional language (EAL).

state schools demonstrated in panel (a) is reduced substantially. As shown in Table 1 there is only a small gap in GCSE results between private- and grammar-school pupils, but here we show a substantial gap in degree course match. The advantage that fee-paying school pupils have, in terms of accessing better-ranked university courses, is to date undocumented and unexplored in the literature, and is a key new finding of this paper.

5 Mechanisms

5.1 Subject and institution

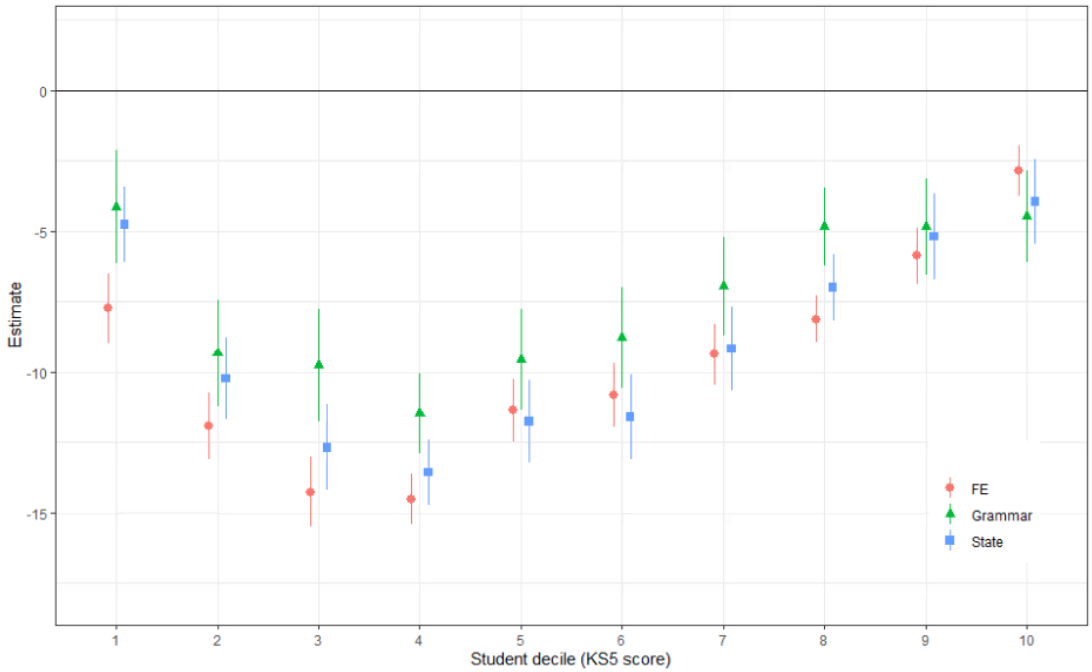
In the UK students enrol on university courses, defined by a combination of institution and subject. It has been noted that there are important differences in employment and earnings on both margins (Britton et al., 2022). As in Campbell et al. (2022), we are able to investigate if mismatch is driven by students attending different institutions or studying different subjects. Figure 4 shows results re-estimating the conditional results in Figure 3 controlling for the subject studied in Panel (a) and then institution attended in Panel (b). The results are extremely clear; almost all of the difference in mismatch is driven by differences in the institution that students attend, rather than the subject they study. Panel (a) shows that among students at the second decile of age 18 attainment who take the same subject, those from private schools are matching to courses almost 15 percentiles higher in our course ranking than those from state schools and FE colleges. When we look at those in the same attainment decile who attend the same institutions, the gap between private school and state/FE students is less; one point and barely significant. Similar patterns are observed in the ability distribution. It is notable that among the highest attaining A-level students who are at the same institution, those who have attended grammar or state schools study, on average, slightly more competitive subjects.

5.2 Applications

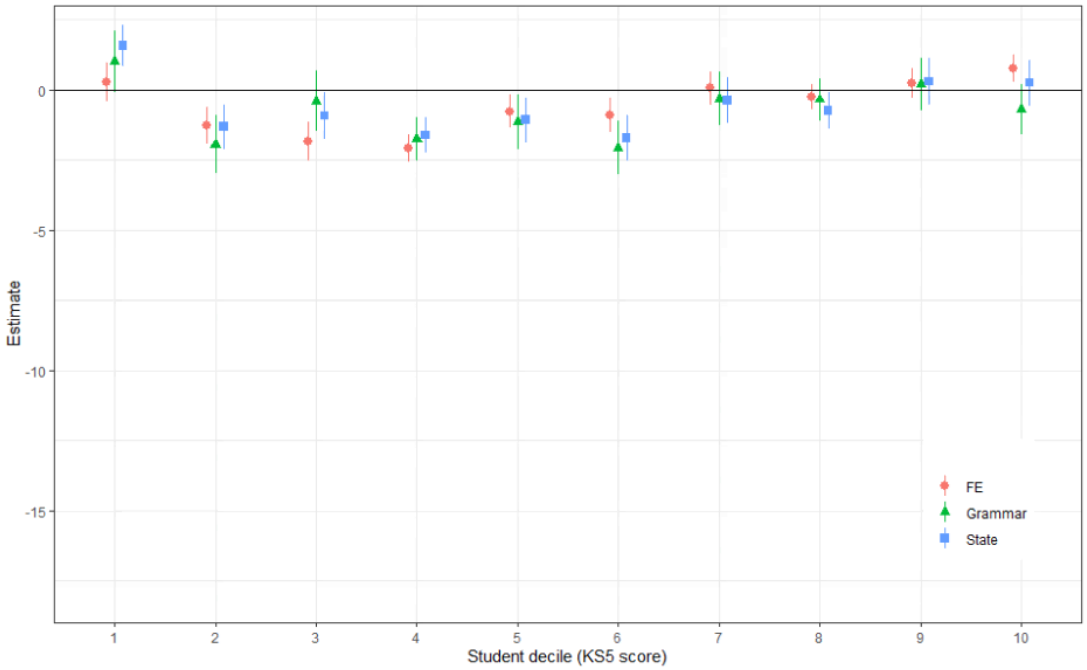
Figure **??** demonstrates the impact of controlling for students' application behaviour. Panel (a) repeats the conditional results in figure 3 while in panel (b) we have added variables to capture the (mis)match of students' applications. Specifically, we add four continuous variables corresponding to the mismatch of their top four UCAS choices. The coefficients move closer to zero implying that application behaviour plays an important role in generating the differences in matches by school type that we observe. For those in the top half of the attainment distribution, once application controls are included, the gaps between private schools and all of the other school types disappear - suggesting that student decisions on where to apply are the driving force behind the gaps in enrolment that we see. However, for those in the bottom half of the distribution (aside from the

Figure 4: Is subject or institution driving mismatch?

(a) + subject fixed effects



(b) + institution fixed effects



Source: NPD-HESA.

Notes: See table 1 for sample sizes. The points are estimates of β_j's in equation (2), for the private-state gap (black dots), the private-FE gap (green triangles), and the private-grammar gap (blue squares). The extending vertical lines represent 95% confidence intervals. In addition to gender and prior attainment (GCSE), the controls include ethnicity, special educational needs (SEN) status, and english as an additional language (EAL). Panel (a) adds subject group fixed effects, and panel (b) adds institution fixed effects to the baseline specification used to obtain the estimates in figure 3.

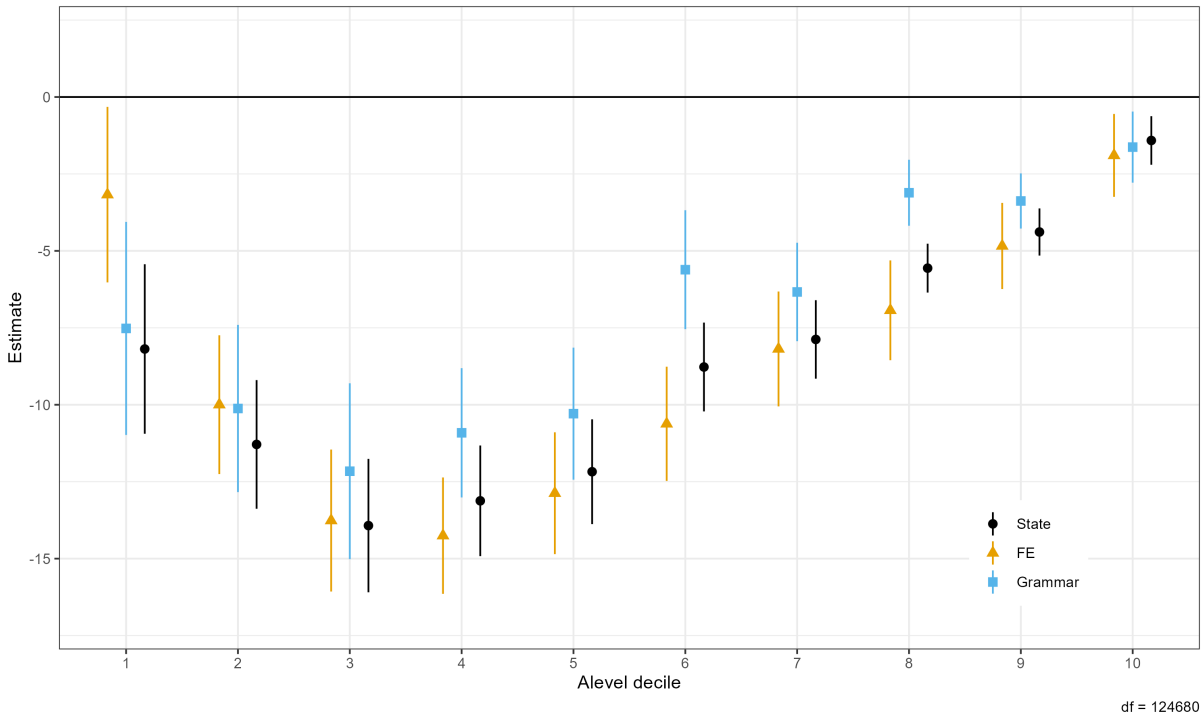
lowest decile), there are still significant advantages to being educated in a fee-paying school for university placement, though these are reduced by up to half compared to the results. This result suggests that application behaviour is driving some, but not all of the gaps in enrolment we see, and points to university admissions decisions as the other part of the explanation. We will return to this point below. It is clear that there are no statistically significant differences in Panel (b) between grammar, state schools and FE colleges at any point in the attainment distribution. All the differences in match between students in these school types are explained by the applications they make.

As discussed in Section 2.1 English students apply for up to five different university courses through UCAS, a central clearing house. We are able to discover more about how applications affect matching outcomes by ranking the applications (using the median prior achievement of the students on that course in 2019, as before). Figure 6 shows the mismatch that would occur if students matched with the highest quality course they apply to, labeled here as 'Choice 1', right through to the lowest quality course to which they apply: 'Choice 5'. The first panel reveals that most students aim high with their first choice. Almost all students who are outside the top decile of attainment would be overmatched if they managed to enrol in their first choice. Differences by school type are minor, although there is evidence that top students at FE Colleges do not aim as high as others, even with the most selective application that they make. Gaps by school type widen as we compare students' relatively less selective applications. Evidence suggests that private-school students are prepared to take more risks in their applications, choosing more selective courses throughout, implying that the course they choose as their 'insurance' offer is likely to be more selective.

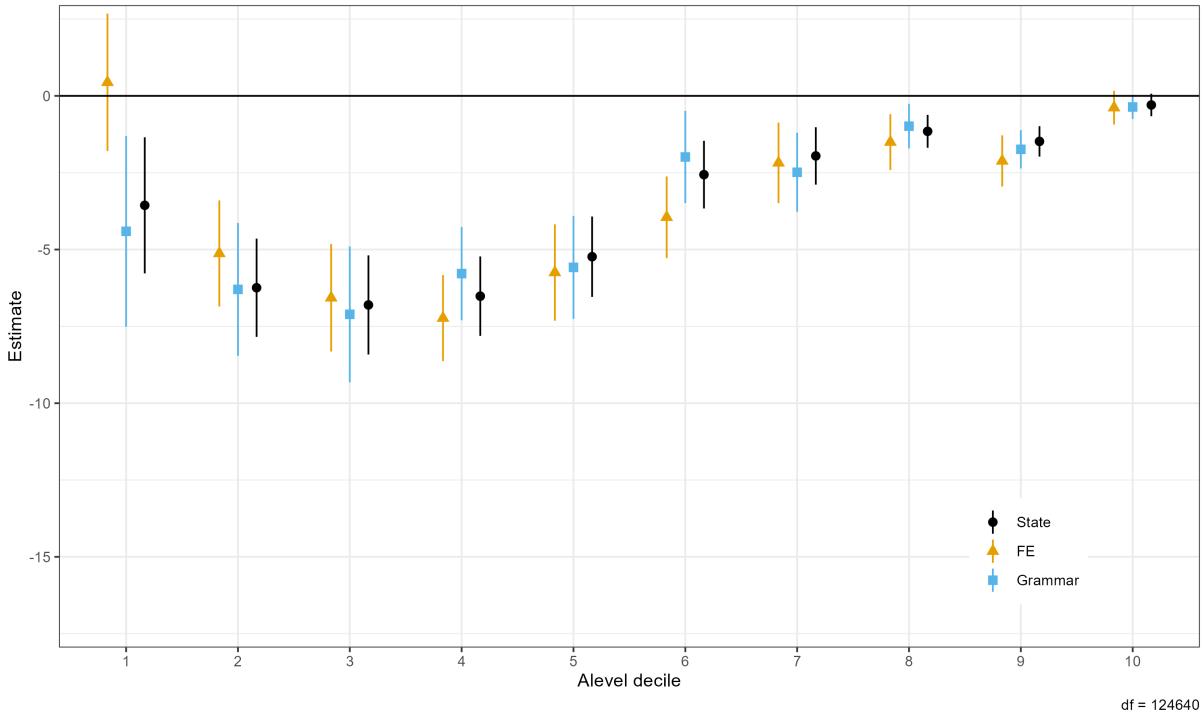
As we compare Choice 1 with students' lower ranked choices we observe that the gaps between the lines becomes larger. Differences in application behaviour (and therefore a substantial part of matching) appear to be driven largely by students from state schools and FE colleges applying to lower-ranked courses relative to their private-school peers. This is increasingly true as we move down their choices, with lower-ability students (particularly those in deciles 2-5) in private schools attempting to overmatch much more with these applications than those from other school types, while the higher ability students from FE colleges are notably less ambitious than those from other school types. The applications made to relatively lower-ranked courses might indicate risk aversion, i.e. that private-school pupils are less risk averse (or more confident) than state-school pupils, while those in FE colleges are more risk averse. Note that the influence of these risk preferences is amplified by the current system in England which requires students to apply to (and accept) places at university "blind", i.e. without their grades.

Figure 5: Mismatch controlling for applications

(a) with individual controls



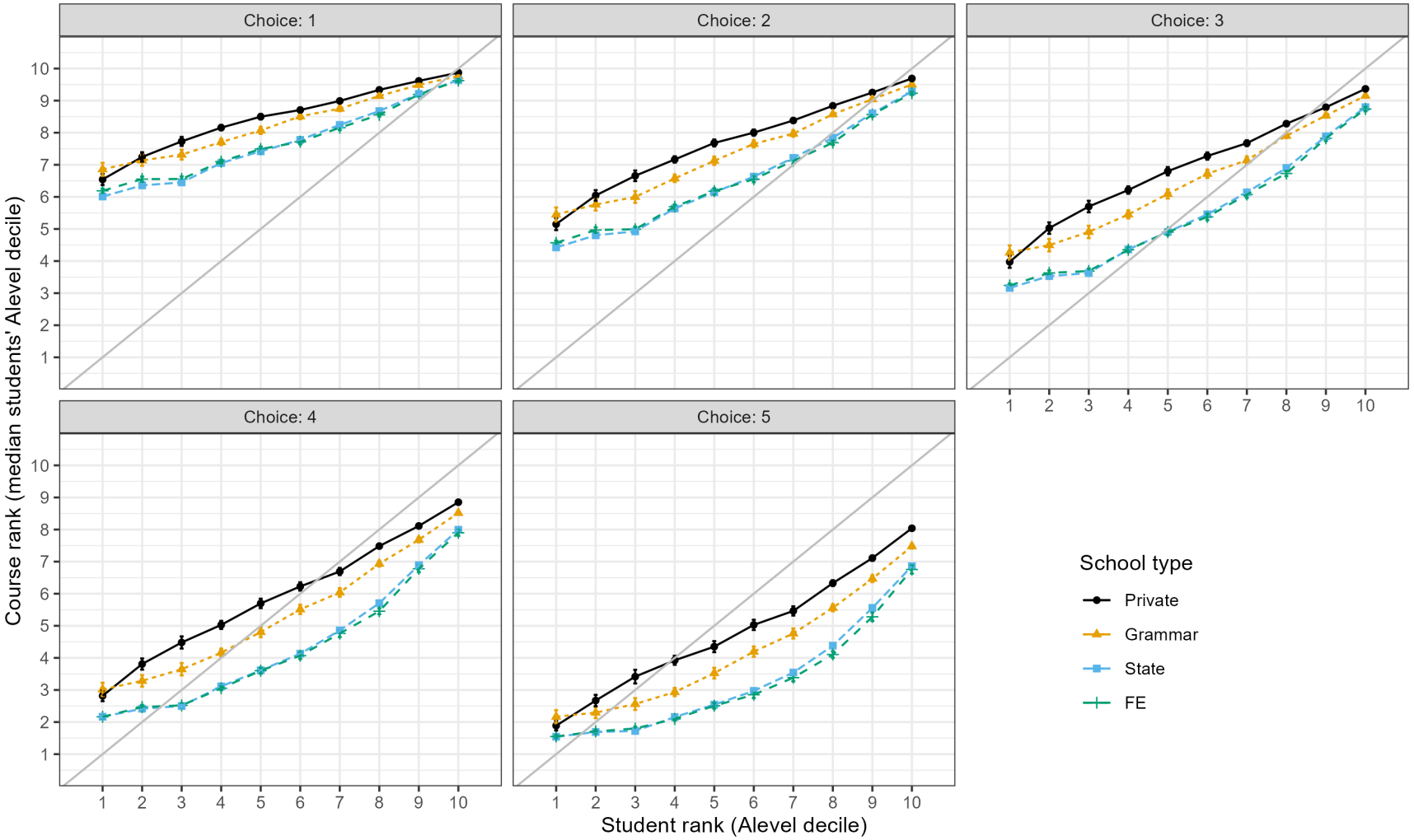
(b) + controls for application mismatch



Source: GRADE.

Notes: See table 1. The points are estimates of β_j's in equation (2), for the private-state gap (black dots), the private-FE gap (green triangles), and the private-grammar gap (blue squares). The extending vertical lines represent 95% confidence intervals. In addition to gender and prior attainment (GCSE), the controls include ethnicity, special educational needs (SEN) status, and english as an additional language (EAL). To this baseline specification we add four continuous variables corresponding to the mismatch of their top 4 UCAS choices.

Figure 6: Mismatch in Applications



Source: GRADE.

Notes: Here we reproduce the student decile-course decile plot from figure 2 for the universities students applied to (rather than enrolled in). Students can make at most five "choices" through UCAS (the applications portal in the UK). They do not rank their choices, so we have ranked their choices in the same way we rank courses for our mismatch measure, presented in panels labelled correspondingly (from "Choice 1" through to "Choice 5"). Only students who made 4 or 5 choices are included in the sample for this figure.

5.3 Discussion

So far, we have found that private-school pupils are more likely to overmatch, and less likely to undermatch, than pupils from other school types. This is particularly the case for pupils in the lower half of the attainment distribution, where private-school pupils attend courses as much as 15 percentiles higher ranked than those from the state sector. We have also learned that this is primarily driven by institution, rather than subject. That is, even for students studying the same major, those from private schools are enrolling in higher-quality institutions. Finally, we have seen that much of these patterns are driven by the students' own application decisions. That is, students from private schools make far more ambitious applications than those from the other school types. Controlling for this application behaviour entirely wipes out the match gaps in the top half of the student ability distribution, though gaps in enrolment match still remain in the bottom half of the distribution.

Examining these mismatch patterns of pupils from private schools compared to other school types can help us to pin down the potential mechanisms through which this increased propensity to overmatch (and reduced likeliness to undermatch) among private-school students could occur. It is particularly of use to compare the patterns of private school and grammar school pupils, since these school types have much in common, allowing us to rule out particular explanations. We can broadly categorize the potential mechanisms into 'pupil factors', 'parent factors', 'school factors', and 'university factors'. We discuss each of these in turn.

Pupil factors. First, it may be the case that private-school pupils simply have higher levels of cognitive or non-cognitive skills than those in other schools. However, we are explicitly comparing pupils with the same university entry grades and prior (age 16) academic attainment, and we still observe substantial differences in the quality of courses private-school students apply to compared to similar students from grammar and other school types. Moreover, grammar school pupils typically receive private tutoring in the years leading up to selection Jerrim and Sims (2019). It is also unlikely that the differences are driven by greater levels of *unobserved* academic preparation or non-cognitive skills possessed by private-school pupils; grammar schools adopt rigorous academic selection procedures, including tests and interviews, which are likely to encompass these skills.

Perhaps private-school pupils have higher academic expectations, and this explains their increased likeliness to aim high in their applications. However, grammar school pupils, while more socioeconomically diverse than private-school pupils, are still a relatively selective and motivated group, suggesting this is unlikely to provide the whole explanation. Confidence and risk aversion could provide some of the explanation, though. Our analysis of the applications of different pupils show that private-school pupils are less likely than all other groups to make 'safety school' applications - almost all of their

applications are to overmatched courses - implying that private-school pupils may simply be more confident, and willing to take risks. The greater financial safety net enjoyed by private-school pupils may also lessen the risk of making bolder applications. Similarly, the high degree of social capital generated through networks, relationships, and access to opportunities that students gain through their attendance at private schools may play a role (Cattan et al., 2022).

Parent factors. Second, there may be differences in the parental attitudes of these pupils. For example, the parents of private-school pupils may be more motivated to help their children gain a place at a high ranked institution, and better equipped to coach them to make more strategic applications. While we cannot fully rule this out, it is important to note that grammar school places are scarce, and accessing a place requires a good degree of parental 'nouse' and ability to navigate a complex system Jerrim and Sims (2019). As noted previously, it is also commonplace for parents to pay for private tutors in the years leading up to the grammar school entry test. Therefore parental motivation is unlikely to be the full story. It is plausible, however, that the parents of private school children are better connected, increasing their children's knowledge of selective universities through family and alumni networks.

School factors. Third, school factors such as a culture towards university progression, or financial resources may provide the explanation. Private schools are likely to have a strong culture of elite university progression and social capital. However, grammar schools send high proportions of pupils to university, including selective university (Montacute and Cullinane, 2018), suggesting the difference is not about a general culture of university aspiration within the school. The most likely remaining explanation is financial resources. Private schools are significantly better resourced than those in the state sector (Sibieta, 2023) and are therefore more able to offer higher quality information, advice and guidance with university applications, likely increasing pupil chances of gaining a place on a higher ranked course (McGuigan et al., 2016). The fact that parents have paid considerable sums of money to gain access to these schools may also generate greater incentives for these schools to ensure their pupils are placed at such universities.

University factors. Finally, university admissions departments may play a role. Our results showed that, for pupils in the top half of the attainment distribution, applications behaviour was the main driving force behind the gaps in match that we observe. However, for lower attainers, gaps remained even once we controlled for applications. This suggests that even when pupils apply to similarly ranked institutions, private-school pupils have more chance of being accepted. As discussed in section 2.1, university applications consist of i) predicted A level grades, ii) a personal statement, though admissions departments will

also be able to see information about the student, including school attended. Therefore the differences that we see could be down to university preferences towards private-school pupils. But it could also be down to differences in predicted grades (increasing students' likeliness to get an offer) or personal statements. Work by Murphy and Wyness (2020) showed that private-school students receive higher predicted grades than those from other school types (including grammar schools), so this could be a factor. Analysis of personal statements by Jones (2013) shows they may disfavor young people from certain educational backgrounds/schools - though he also notes many more similarities between grammar and private-school students versus state school students.

We conclude that the large differences in the quality of courses similarly achieving private-school students apply to and enrol in, versus other groups, are not driven by pupil academic preparation or ambition, parental motivation or know-how, or school culture. Our conclusion instead is that pupil confidence and lower risk aversion, coupled with school (and parental) financial resources, provide the explanations most consistent with our results. There may also be some role for university decision-making in favour of private-school pupils, especially for lower-attaining students.

6 Conclusion

This paper adds important detail to the analysis of the mismatch between students and degree courses, focusing on disparities across different types of schools. We document substantial differences in how students from private, grammar and state schools, and from FE colleges match to university courses. Notably, private-school students are more likely to overmatch – attending higher ranked courses than their attainment distribution would suggest – while students from state and FE colleges are more prone to undermatch; this is especially pronounced among the highest achieving pupils at FE colleges.

Much of this difference is driven by application behavior, with private-school students showing more ambition and confidence in their application choices, resulting in better placements. While the private school 'advantage' is apparent across the entire distribution, it is greatest in the bottom half of the student attainment distribution, suggesting that private schools are particularly adept at helping their lower ability students to access more selective courses. Importantly, the findings highlight how inequalities in university course placements perpetuate social inequalities, as the type of school attended plays a key role in influencing these outcomes.

Overall, our findings highlight the need for more equitable application support and guidance across school types to address persistent inequalities in higher education access. We also plan to study to what extent the peculiarities of the English university admissions system – pre-qualification admissions and a limited number of applications – exacerbate these inqualities.

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A GRADE dataset

As discussed in section 3, we use a different data source (GRADE) to study applications as a mechanism as our main data source (NPD-HESA) does not contain data on applications. Note that for the GRADE data we impose an additional selection criteria and only include those who made four or five UCAS applications in the 2019 cycle.

In this appendix we present descriptive statistics for the GRADE dataset and reproduce some of our main analyses. First, we reproduce the summary statistics presented in table 1 for our main sample, in table A.1 for our GRADE sample. Although the

Table A.1: Summary statistics for the GRADE data sample

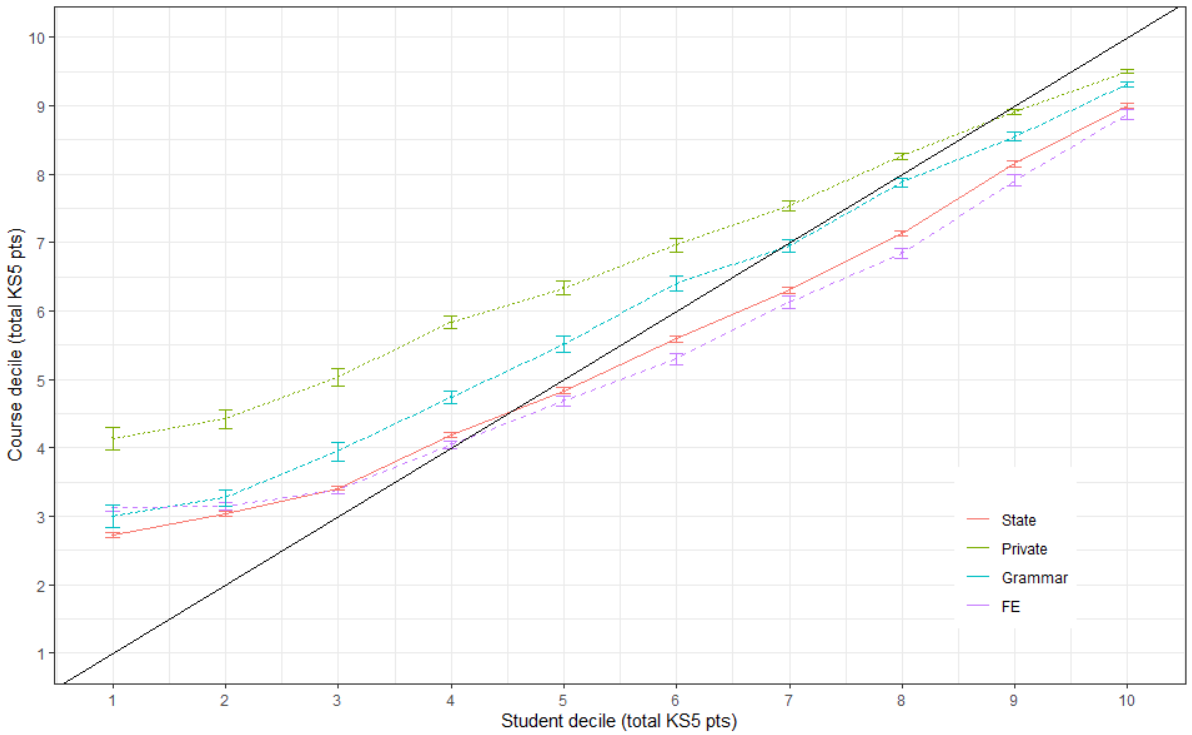
School type:	**Private**	**Grammar**	**State**	**FE**
Female	7,187 (50%)	6,782 (54%)	41,472 (57%)	15,384 (61%)
Ethnicity				
Other	- (-%)	141 (1.1%)	1,411 (1.9%)	394 (1.6%)
Asian	- (-%)	2,287 (18%)	10,364 (14%)	3,154 (13%)
Black	- (-%)	623 (4.9%)	4,834 (6.7%)	1,528 (6.4%)
Chinese	- (-%)	217 (1.7%)	450 (0.6%)	170 (0.7%)
Mixed ethnicity	- (-%)	715 (5.7%)	3,590 (4.9%)	1,047 (4.4%)
Unclassified	- (-%)	144 (1.1%)	910 (1.3%)	219 (0.9%)
White	- (-%)	8,478 (67%)	51,125 (70%)	17,430 (73%)
FSM	- (-%)	377 (3.0%)	6,081 (8.4%)	1,874 (7.8%)
SEN status				
No SEN	- (-%)	11,862 (94%)	68,855 (95%)	22,941 (96%)
SEN w/o statement	- (-%)	719 (5.7%)	3,487 (4.8%)	885 (3.7%)
SEN w/ statement	- (-%)	24 (0.2%)	342 (0.5%)	116 (0.5%)
Language				
English	- (-%)	10,444 (83%)	56,777 (78%)	19,445 (81%)
Other	- (-%)	2,120 (17%)	15,494 (21%)	4,465 (19%)
Unclassified	- (-%)	41 (0.3%)	413 (0.6%)	32 (0.1%)
Total KS5 points	142 (49)	145 (48)	111 (42)	106 (45)
Avg. pts per GCSE	6.93 (1.35)	7.00 (1.05)	5.81 (1.27)	5.77 (1.24)
A-level decile				
1 *(lowest)*	491 (3.4%)	303 (2.4%)	6,243 (8.5%)	3,445 (14%)
2	615 (4.3%)	484 (3.8%)	7,171 (9.8%)	2,504 (10.0%)
3	583 (4.0%)	478 (3.8%)	7,536 (10%)	2,503 (10.0%)
4	1,352 (9.4%)	1,098 (8.7%)	12,098 (17%)	3,865 (15%)
5	911 (6.3%)	804 (6.4%)	7,243 (9.9%)	2,199 (8.8%)
6	988 (6.9%)	952 (7.5%)	6,655 (9.1%)	2,061 (8.2%)
7	1,235 (8.6%)	1,072 (8.5%)	5,645 (7.7%)	1,868 (7.4%)
8	2,630 (18%)	2,192 (17%)	9,460 (13%)	3,030 (12%)
9	2,264 (16%)	1,914 (15%)	5,561 (7.6%)	1,831 (7.3%)
10 *(highest)*	3,345 (23%)	3,321 (26%)	5,467 (7.5%)	1,814 (7.2%)
N	14,414 (12%)	12,618 (9.7%)	73,079 (58%)	25,120 (20%)

Source: GRADE.

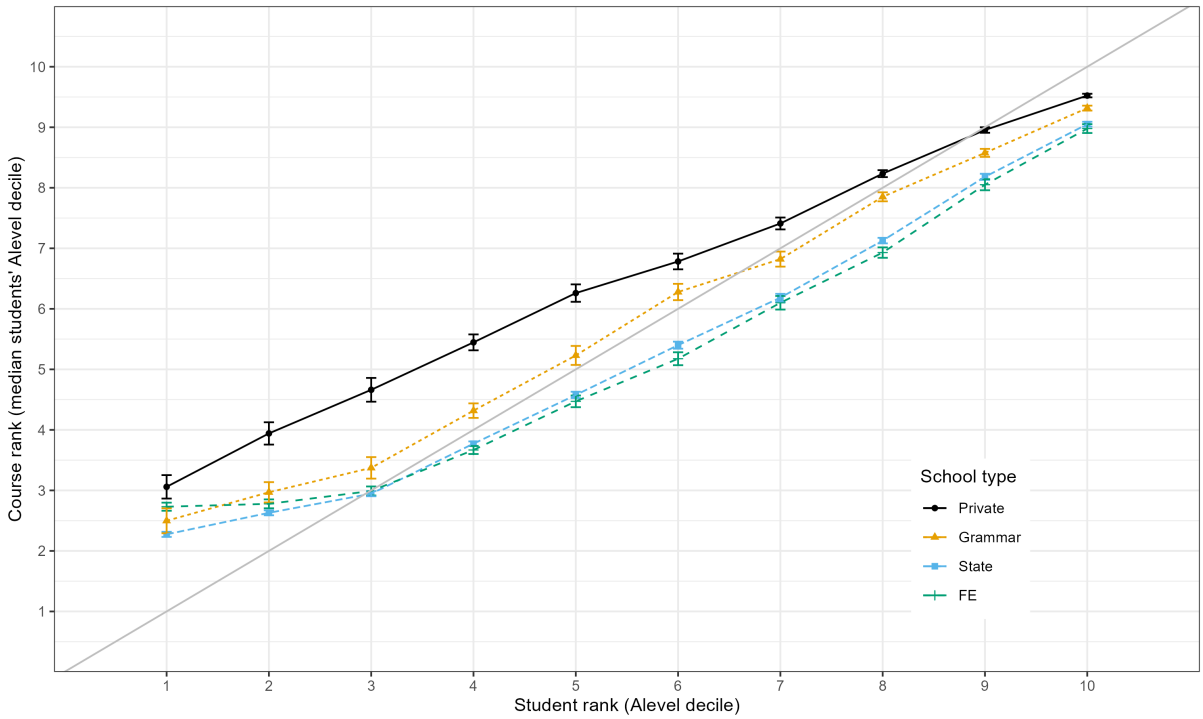
Notes: For all categorical variables the count per value is displayed (with the share as a percentage in parentheses); for continuous variables, the mean is displayed (with the standard deviation in parentheses). The majority of the private school pupil are missing data on background characteristics. Students can make at most five "choices" through UCAS (the applications portal in the UK). Only students who made 4 or 5 choices are included in the sample.

Figure A.1: Decile-decile plots using NPD-HESA and GRADE data sources

(a) NPD-HESA



(b) GRADE



Source: (a) NPD-HESA. (b) GRADE.

Notes: Here we reproduce the student decile-course decile plot from figure 2 using the GRADE dataset and present it next to the same plot using the NPD-HESA data. Students can make at most five "choices" through UCAS (the applications portal in the UK). Only students who made 4 or 5 choices are included in the sample for the figure in panel (b).

absolute sample size is smaller for GRADE, which is likely driven by only including students applying to four or five places through UCAS, the proportions of students across school types, and background characteristics, and the attainment distributions are all reassuringly similar. In figure A.1 we show the decile-decile enrolment mismatch plot using NPD-HESA data in panel (a) and reproduced using GRADE data in panel (b). The patterns across the two panels are very similar, with only a slight difference for the lowest attaining private-school students. Finally, comparing figure 3b and 5a, reproduced side-by-side in figure A.2, we again see very similar patterns in terms of conditional match gaps throughout the attainment distribution across NPD-HESA (a) and GRADE (b).

B COVID-19

B.1 Disruption from the COVID-19 pandemic

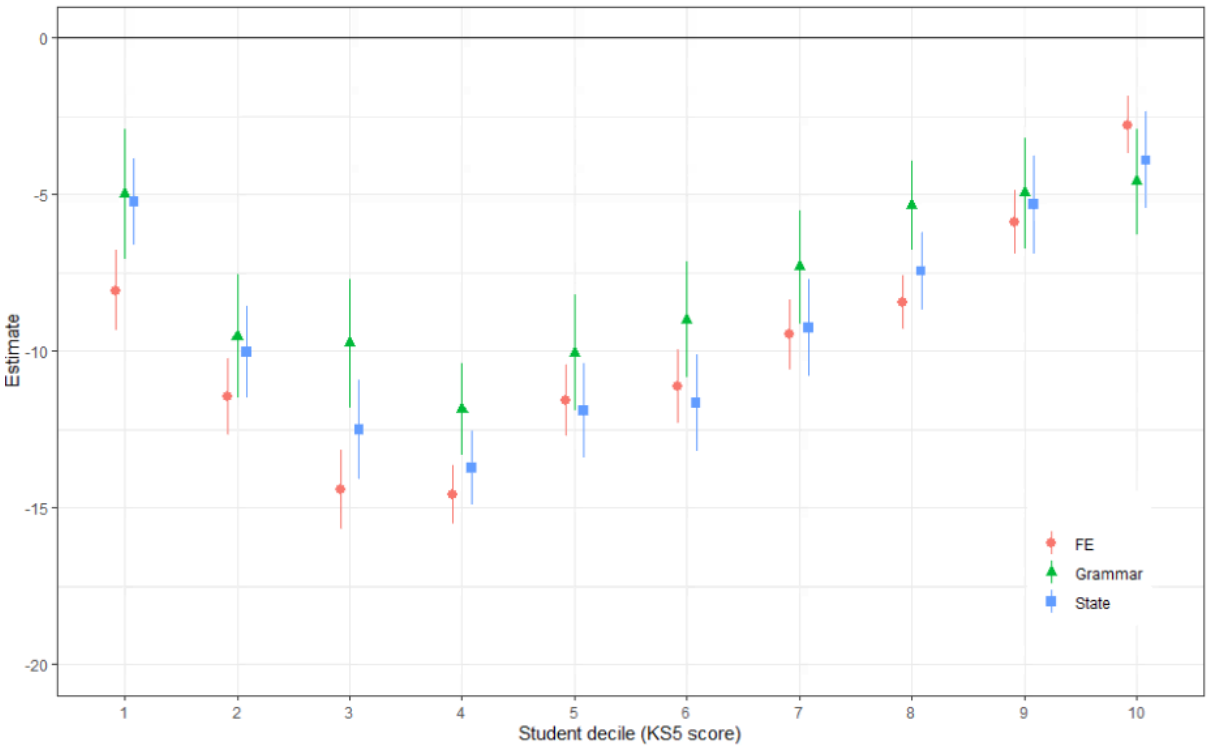
The disruption to formal examinations in 2020 was unprecedented and the impact on students is likely to be felt in multiple ways for years to come. A-level examinations were cancelled as a result of the pandemic, and students were assigned Centre Assessed Grades (CAGs), predicted by their teachers. Following fears that schools would be incentivised to over predict their pupils to maximise their chances of gaining a university or college place, or a better job, CAGs were meant to be standardized using an algorithm which would deflate overoptimistic grades, by comparing them to the history of grades in that school/subject. However, when standardized grades were revealed, many pupils believed they had been unfairly treated by the algorithm, particularly if they attended a school with a history of low performance, and a public outcry ensued. The result was that the standardized grades were overturned and the teacher predictions — which were made under the assumption that they would be standardized, and therefore may have been affected by that — became the official results. Replacement of exam results with CAGs may therefore have significant implications for university enrollment patterns and student-to-degree mismatch in 2020.

Compounding this, each year universities make 'offers' to applicants, conditional on them meeting A level requirements. In 2020, the majority of these offers were made on the assumption the student would sit exams. Despite the replacement of exam results with CAGs, leading to unprecedented grade inflation (e.g. FFT Education Datalab, 2022, showed the proportion of students gaining a C or above increased from 75.8% to 87.9%), universities were legally obliged to accept students whose CAGs matched the offer.

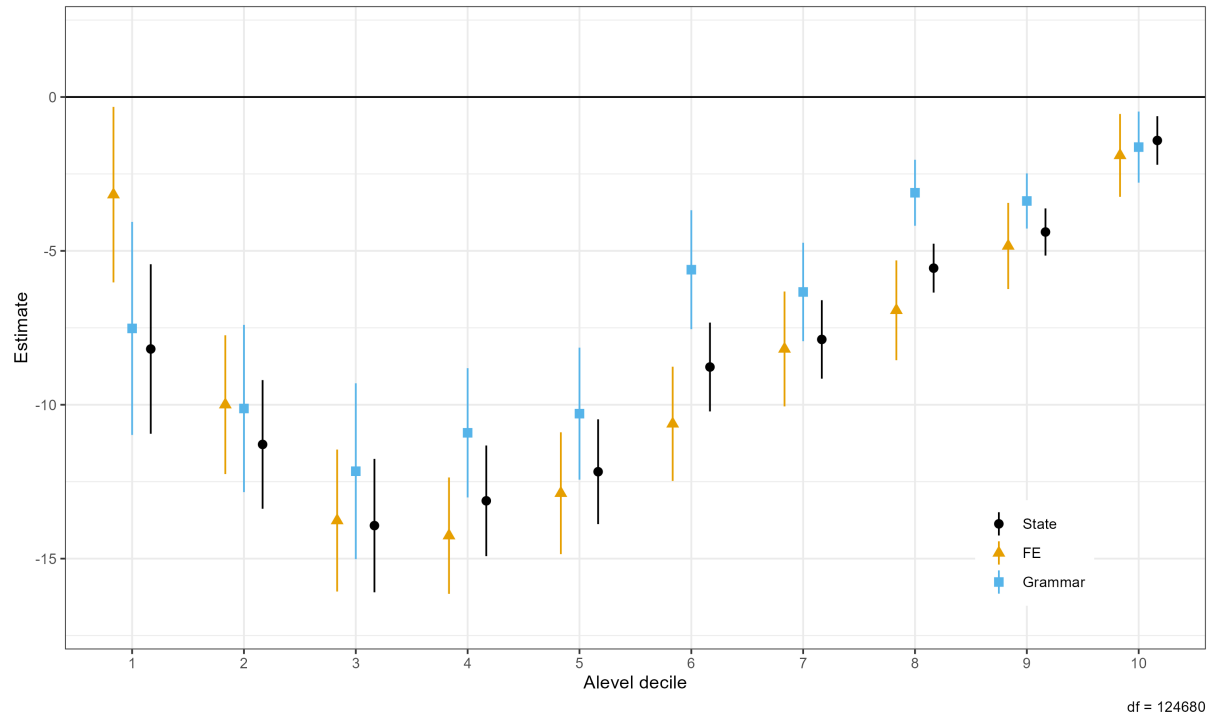
There were other important elements impacting HE enrolment in 2020 — concern over falling applications from overseas students led universities to make more offers to domestic students, and there were also concerns that many students would defer their places by a year, although according to 2020 data deferral rates are similar to 2019 (at about 17% of

Figure A.2: Comparison of conditional match gaps across datasets

(a) NPD-HESA



(b) GRADE



Source: (a) NPD-HESA. (b) GRADE.

Notes: Here we display the conditional mismatch gap plots from our two datasets next to each other. The plot in panel (a) is the same as in figure 3b and in (b) this is the same plot as in 5a. See the original plots for further notes.

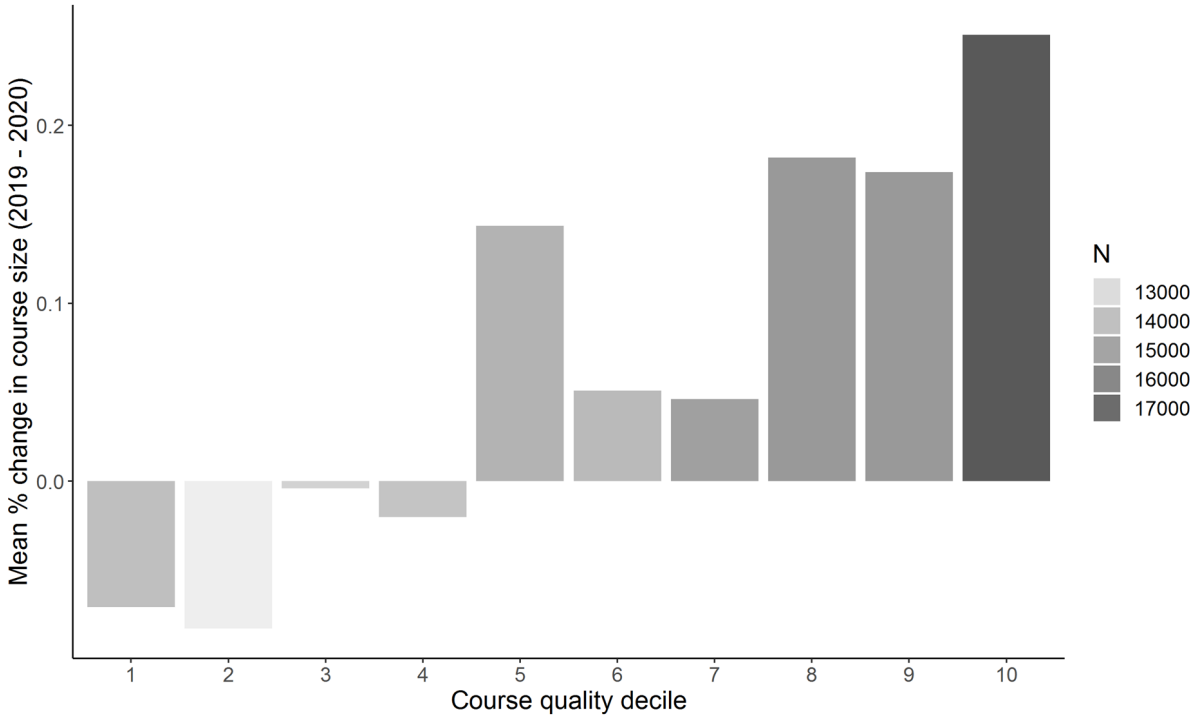


Figure B.1: Change in course size 2019 to 2020 by course decile

placed students).

Figure B.1 shows the expansion of courses between the 2019 and 2020 entry years by course quality decile as calculated in 2019. Courses with students in the top decile of quality expanded by 20 percent, with smaller but still substantial increases in the fifth, eighth and ninth deciles. In summary, more students were "over-matched" in 2020 compared to previous years. From an equity point of view it is of interest to know if these additional over-matched students are concentrated within particular school types. In addition, the nature of the disruption, occurring after students had submitted their applications, allows us to understand more about the mechanisms that generate mismatch. Increased mismatch by school type in 2020 indicates that mismatch differences by school type is generated by which course students attend within those they apply for. No change indicates that mismatch might be primarily influenced by students' application choices. We are also able to assess these two mechanisms directly, as described below.

B.2 Mismatch in the Covid-19 pandemic

Students doing their A-levels in 2020 had a very different experience to those in our main sample from the year before. Here, we assess whether this had differential benefits for those who attended private schools. We know that A-levels were awarded based on teacher assessment, without the adjustment that was initially intended. Figure B.2 demonstrates the extent of grade inflation between 2019 and 2020 by school type. In Panel (a) we see that the distribution of Key Stage 5 points shifts to the right across all types of provision.

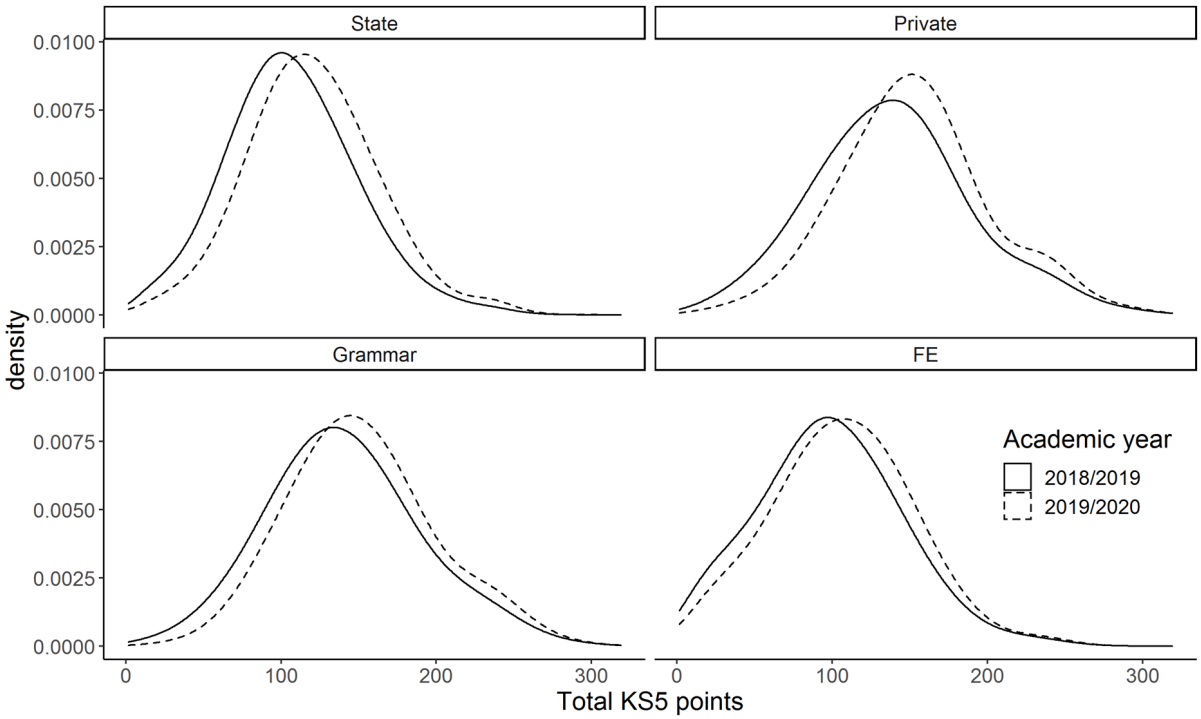
There is evidence that there is a stronger shift upward for those with relatively low scores in private schools, leading to a tighter distribution around a higher mean. Panel (b) looks at grade inflation directly by showing the increase in points score at each percentile of the A-level points distribution for each school type. This demonstrates that grade inflation was largest in the second quartile, where most students gained between 16 and 17 points; equivalent to two grades across all A levels taken (usually three). The slightly greater grade inflation among private-school students is observed in Panel (b) as the higher dotted line, between the 25th and 70th percentiles, this is in the lower range of attainment among these students, who generally do better than those in other school types.

In the upper panel of Figure B.3 we show the full pattern of matching by school type while the lower panel shows the conditional private school coefficient as in Figure 3 for both 2019 and 2020. Although there is slight evidence of greater overmatch in 2020 for private-school students in deciles three and four, there are no significant differences in the coefficients. Overall, there is no evidence that the exceptional circumstances in 2020 exacerbated the matching advantage experienced by private-school students. Earlier we discovered that much of the private school advantage in 2019 is explained by differences in students' application decisions. As applications proceeded as usual in 2020, matches are not as strongly affected by the COVID disruption in that year as we might have anticipated a priori.

This analysis shows the impact of the COVID-19 pandemic on university admissions, finding that although grade inflation occurred, there was little evidence of significant changes in mismatch patterns by school type. This confirms that application behavior, rather than changes in the admission process during the pandemic, drive the differences in educational outcomes we have documented.

Figure B.2: Grade inflation by school type, 2019 vs 2020

(a) KS5 points distribution



(b) Distribution of difference in KS5 points 2019 vs 2020

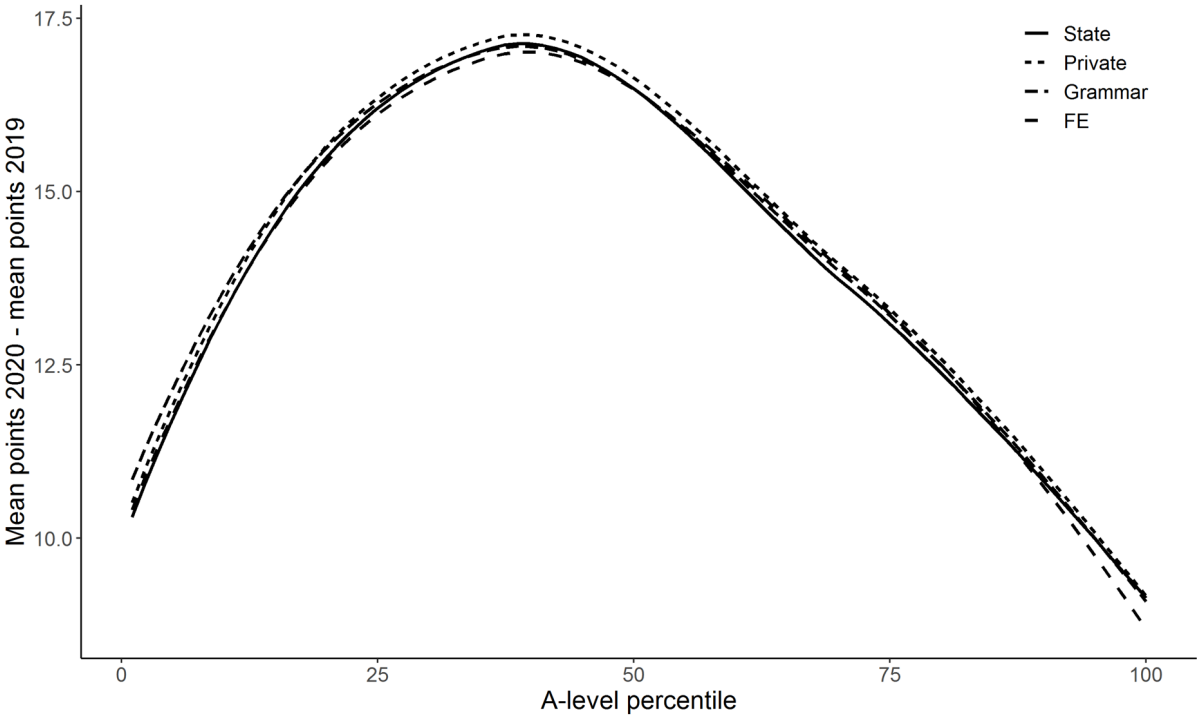
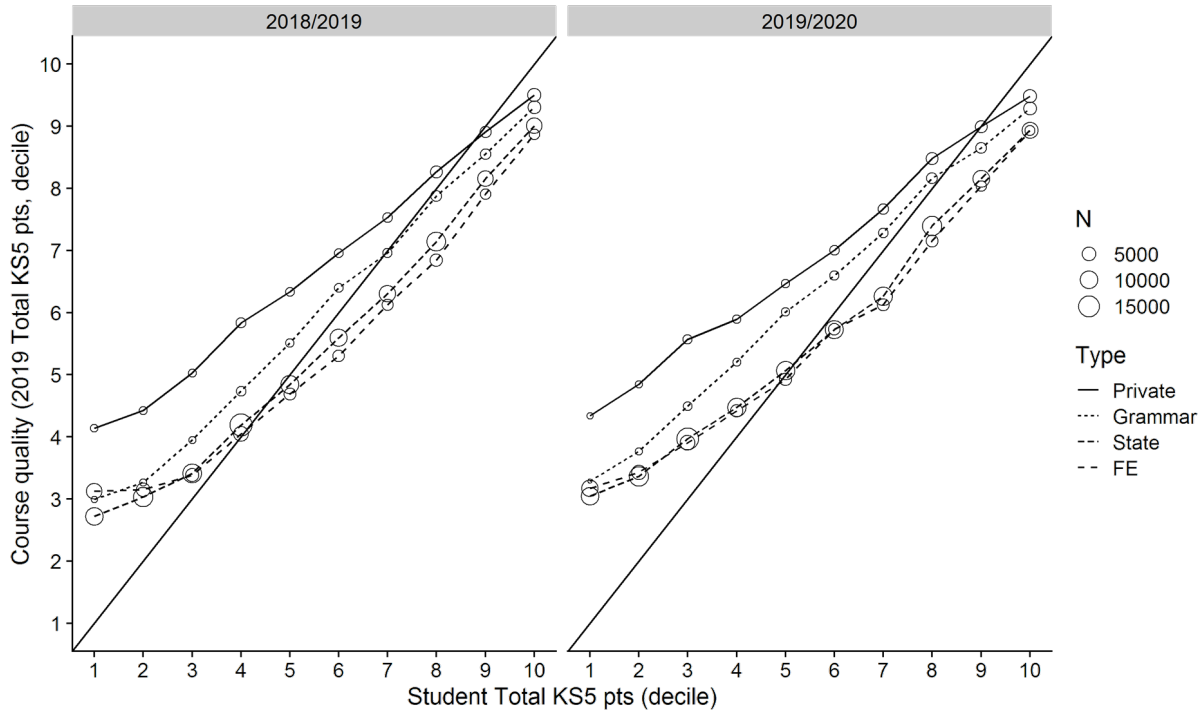
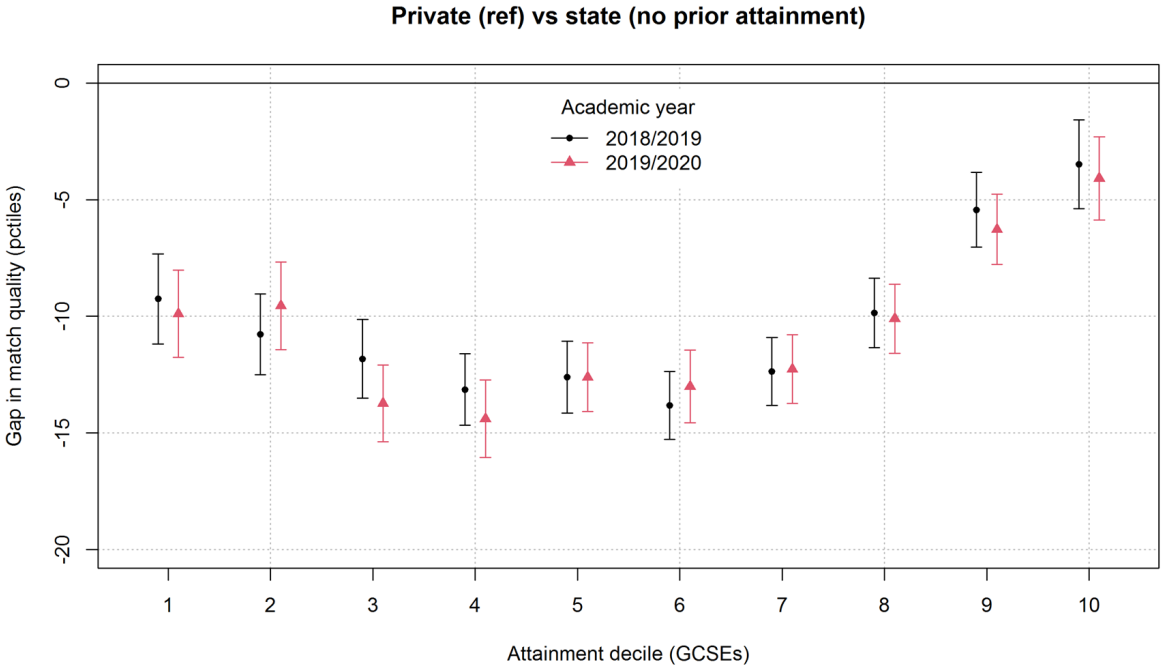


Figure B.3: Mismatch before and during Covid

(a) School type match



(b) Conditional match gaps



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