Entry into Grammar Schools in England

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1. Introduction

In the English education system, there are 164 grammar schools remaining. Some of these schools are 'stand-alone' grammars – selective schools that coexist alongside comprehensive schools and attract able children from a very wide geographical area. Other grammar schools are part of selective local authority education systems, such as those found in Kent or Buckinghamshire. Whether stand-alone or part of a wider selective system, grammar schools have been criticised for admitting very low proportions of children from more socio-economically disadvantaged backgrounds. In this report, we attempt to shed some light on this issue by analysing the extent to which grammar schools and grammar systems admit students who are eligible for free school meals and from deprived socio-economic backgrounds more generally. We also explore whether some grammar schools are more or less likely to admit such students, taking account of the socio-economic profile of their local area.

To do this, we model how family background and other pupil characteristics affect the likelihood that a pupil will attend a grammar school. In quite general terms, there are two main reasons why pupil or family characteristics might affect their probability of attending a grammar school. First, they might affect the probability that pupils apply to attend a grammar school in the first place – for example, due to differences in attitudes to education, beliefs in their own ability, distance from a grammar school or perhaps a preference for single-sex schooling, given the tendency for many grammar schools to be single-sex. Second, conditional on applying, pupils with different characteristics might have different chances of passing the test to attend a grammar school. This could be due to differences in cognitive ability or due to different levels of preparedness for the test, though these are clearly hard to distinguish.

We will compare the characteristics of pupils attending selective schools with those of pupils attending other schools, and provide further evidence on the likely drivers of these differences. In particular, in Section 3, we compare the characteristics of pupils attending grammar schools with those of pupils attending other types of schools in the local area. These characteristics include those identified in the previous literature as affecting academic achievement – namely, socio-economic background, ethnicity, educational needs, month of birth, prior level of attainment at Key Stage 2 and type of primary school attended. We also examine the proportion of pupils attending grammar schools who are new to the state-funded system at age 11 and hence who may have transferred in from the private sector. We will then use multivariate regression analysis in Section 4 to dig deeper into how pupil characteristics directly affect the probability of attending a grammar school – for example, whether deprived pupils are less likely to attend grammar schools simply because they have lower levels of attainment by age 11.

2. Data and methodology

In order to analyse the characteristics of pupils attending grammar schools, we use two main sources of data. First, we use the National Pupil Database, which is a large administrative data set recording every pupil in state schools in England. This provides some limited background information on all pupils (e.g. whether they are eligible for free school meals or whether they have English as an additional language), as well as their attainment in Key Stage 2 tests. Second, we use data from Edubase (the Department for Education's register of all educational

establishments in England and Wales) to identify various school characteristics and policies, such as school type and their admissions policies. Together, these data sets allow us to analyse the characteristics of pupils attending grammar schools and other types of schools. We are mindful that these administrative data do not contain detailed measures of individuals' socio-economic background. Chowdry et al. (2013) show that eligibility for free school meals and neighbourhood-based measures of socio-economic disadvantage provide adequate proxies for an individual's socio-economic background, though clearly such measures are not ideal.

Throughout, we focus on the most recent cohorts of Year 7 pupils to enter grammar and other secondary schools at age 11. As a result of our focus on pupils in Year 7, we exclude from our analysis three grammar schools that start at later ages – one school in Kent and two schools in Poole. Our analysis therefore only looks at 161 of the 164 grammar schools remaining in England.

Data available to us include the records from the National Pupil Database for three successive cohorts: those entering secondary school in September 2009, 2010 and 2011. However, much of our analysis excludes the 2010 cohort as a boycott of Key Stage 2 (KS2) tests by primary school teachers meant that attainment data for this cohort are incomplete. In that year, around one-fifth of the cohort did not take the KS2 tests.

Grammar schools are not present in all local authorities. Furthermore, where they are present, they vary in their number. Kent and Buckinghamshire are still wholly selective local authorities, with 32 and 13 grammar schools, respectively. However, sometimes grammar schools are relatively isolated, with only one or two grammar schools in the local authority. In the latter case, we might expect the schools to have a more selected intake, as there may be more pupils competing for places at these schools. We also expect grammar schools in London to show a different pattern as these schools often have very large catchment areas in terms of pupil population as well as geography. Therefore, when we compare the characteristics of pupils attending grammar schools with those of other pupils in their local area, we classify local authorities into three different groups:

- **selective local authorities** – identified on the basis of 10% or more pupils in the local authority attending a selective school;[1]
- **isolated grammar schools** – local authorities containing at least one grammar school, but with less than 10% of pupils attending a selective school;
- **London** – we compare pupils attending grammar schools in London with all pupils attending state-funded schools in London. These local authorities are excluded from the above two groups.

The local authorities in each group are shown in Table 2.1, together with the proportion of pupils in the state education system attending a grammar school. As pupils may attend grammar schools in one local authority but live in another, we also show the proportion of pupils at grammar schools who live outside the local authority.

[1] This is essentially an arbitrary threshold, but it is the same as that used by Atkinson, Gregg and McConnell (2006).

Table 2.1. Proportion of pupils attending grammar schools, by local authority, 2009–10 to 2011–12

Local authority (LA)	Proportion of pupils in LA at grammar schools	Proportion of pupils at grammar schools living outside LA	Number of schools
All	**0.040**	**0.249**	**161**
Selective local authorities	***0.252***	***0.193***	***106***
Trafford	0.385	0.285	7
Buckinghamshire	0.360	0.192	13
Slough	0.324	0.600	4
Kent	0.284	0.068	32
Southend-on-Sea	0.283	0.534	4
Torbay	0.276	0.406	3
Medway	0.275	0.120	6
Wirral	0.258	0.089	6
Lincolnshire	0.227	0.177	15
Bournemouth	0.188	0.378	2
Reading	0.188	0.750	2
Plymouth	0.148	0.345	3
Gloucestershire	0.126	0.045	7
Calderdale	0.117	0.300	2
Isolated grammar schools	***0.046***	***0.276***	***36***
Birmingham	0.082	0.312	8
Warwickshire	0.079	0.228	5
Telford and Wrekin	0.078	0.556	2
Walsall	0.056	0.454	2
Stoke-on-Trent	0.056	0.664	1
North Yorkshire	0.053	0.294	3
Wiltshire	0.049	0.216	2
Wolverhampton	0.043	0.508	1
Lancashire	0.041	0.142	4
Kirklees	0.034	0.182	1
Essex	0.029	0.213	4
Liverpool	0.025	0.277	1
Cumbria	0.022	0.000	1
Devon	0.017	0.135	1
London grammar schools	***0.129***	***0.508***	***19***
Sutton	0.274	0.630	5
Bexley	0.221	0.409	4
Kingston upon Thames	0.169	0.684	2
Barnet	0.105	0.656	3
Bromley	0.073	0.358	2
Redbridge	0.072	0.136	2

Enfield	0.049	0.551	1

Note and Source to Table 2.1
Note: Includes all grammar schools that have an intake at Year 7.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

For London, we only show these figures for the local authorities that contain at least one grammar school. However, we will compare the characteristics of these pupils with those of pupils in state-funded schools in London as a whole.

Around 4% of Year 7 pupils nationally attended a grammar school in the years 2009–10 to 2011–12. This figure is naturally much higher (25%) in selective local authorities. Amongst these selective local authorities, Trafford, Buckinghamshire, Slough and Kent see the largest shares of pupils attending grammar schools (as a proportion of all pupils attending state schools in these authorities). However, in the case of Slough, this mainly results from large numbers of pupils attending grammar schools in Slough but living in different local authorities. Large numbers of grammar school pupils living outside the local authority can also be seen for other geographically small authorities, such as Reading, Southend-on-Sea and Torbay.

Focusing on local authorities containing isolated grammar schools, we naturally see smaller proportions of pupils attending grammar schools (5%) than in selective local authorities. However, the proportion ranges from about 2% in the case of Devon to about 8% in Birmingham. Furthermore, around 28% of pupils attending isolated grammar schools live in a different local authority from the one where the school is located, which is greater than the average seen in selective local authorities (19%). In other words, stand-alone grammar schools draw in children from a wider geographical area and certainly from beyond local authority borders. Like selective authorities, we also see greater proportions living in a different local authority for grammar schools in geographically small local authorities such as Stoke-on-Trent, Telford and Wrekin, and Wolverhampton.

In London, around 4% of pupils attend a grammar school, around the national average. The greatest proportions of pupils at a grammar school are seen for Sutton and Bexley. However, the proportion of pupils at grammar schools who live in a different local authority is much higher in London (51%) and is particularly high for Kingston upon Thames, Barnet and Sutton. This suggests very wide catchment areas for grammar schools in London. It is for this reason that we will compare the characteristics of pupils attending grammar schools with those of *all* pupils attending state schools in London. However, it is worth noting that pupils in London are generally more likely to attend schools in a different local authority from the one in which they reside as compared with the rest of England.[2] This tendency is therefore not particular to grammar schools.

3. Characteristics of pupils at grammar schools

This section examines the characteristics of pupils attending grammar schools, compared with pupils attending other state schools in the same local authorities. We do this separately for the

[2] Additional Tables 1 at https://www.gov.uk/government/publications/schools-pupils-and-their-characteristics-january-2012.

three types of local authority – selective local authorities, isolated grammar schools and London. The data allow us to observe both individual pupil characteristics, such as their distance to the nearest grammar school and their KS2 attainment, and various primary-school-level characteristics.

Individual pupil characteristics

Appendix Tables A.1–A.3 present detailed comparisons of the average characteristics (measured in Year 7) of pupils attending grammar schools and of pupils attending other state-funded schools in the same local authority. They also indicate whether differences along each dimension are statistically significant. We look at the following characteristics:

- **socio-economic background** – eligibility for free school meals[3] (FSM) and quintile of IDACI scores (an area-based indicator of child deprivation);
- **ethnicity**;
- **quarter of birth**;
- **English as an additional language (EAL)**;
- **special educational needs (SEN)**;
- **distance to nearest grammar school**;
- **Key Stage 2 test results in English and mathematics**;
- **whether or not pupil attended a state-funded school in Year 6** – pupils who did not attend a state-funded school will have attended either an independent school or a school outside England.

A number of points emerge from these comparisons, which are illustrated in Figures 3.1 to 3.7:

- Grammar schools contain a significantly lower proportion of deprived pupils than live in the local area.
- Non-white pupils are more likely to attend grammar schools than pupils from white backgrounds even before we condition on prior attainment and socio-economic background. Previous research (Wilson, Burgess and Briggs, 2011) has indicated that non-white pupils also outperform white students once one controls for socio-economic background.
- Pupils born in the autumn are more likely to attend grammar schools than pupils born in the summer, consistent with the finding from previous research that summer-born children have lower achievement (see, for example, Crawford, Dearden and Greaves (2013)).
- Pupils who get into grammar schools tend to have higher KS2 results, particularly in maths.
- Conditional on achievement in both English and maths, poorer pupils are still less likely to attend grammar schools, particularly in London.

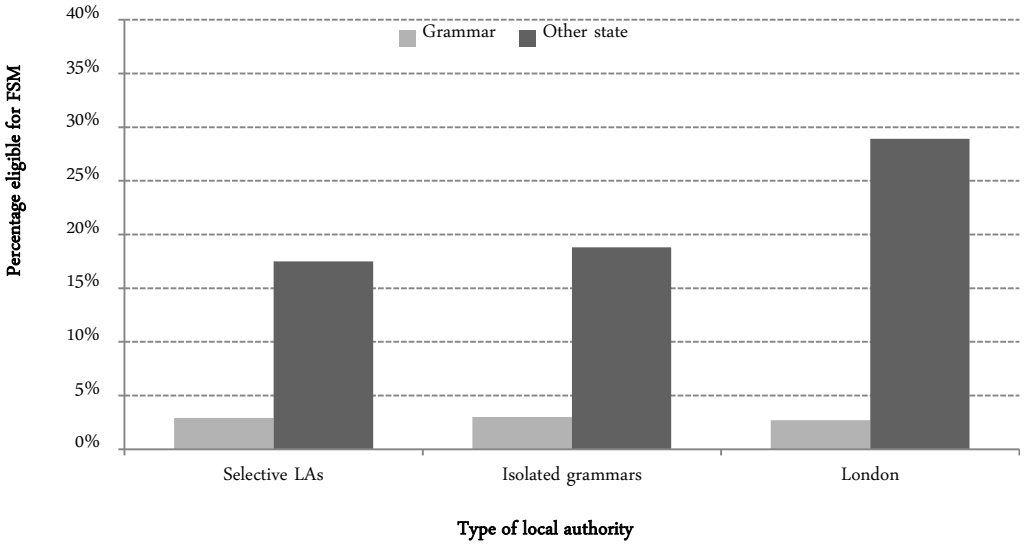
As has been shown before (Atkinson, Gregg and McConnell, 2006), grammar schools contain a much smaller proportion of pupils from deprived backgrounds than other state-funded schools in the same local authority. Poorer students are significantly less likely to attend a grammar

[3] Children are eligible for free school meals if a parent is receiving an out-of-work benefit, such as income support, income-based jobseeker's allowance or income-based employment and support allowance.

school. This is true both in terms of the proportion of pupils eligible for FSM and based on their IDACI scores.

Figure 3.1 shows the proportion of pupils eligible for FSM at grammar and other state-funded schools for the three different local authority types. Across each type of authority, around 3% of pupils at grammar schools are eligible for FSM. This compares with about 18% at other state-funded schools in selective local authorities and 19% in areas where grammar schools are somewhat isolated. However, the gap is much larger for London as it is generally more deprived, on average. About 29% of pupils at non-grammar schools are eligible for FSM in London, creating a gap of about 26 percentage points between grammar and non-grammar schools in London. Therefore, pupils in grammar schools are far less deprived than those in other schools in their local area, with the gap being that much larger for London.

Figure 3.1. Percentage of Year 7 pupils eligible for FSM at grammar and other state-funded schools, 2009–10 to 2011–12



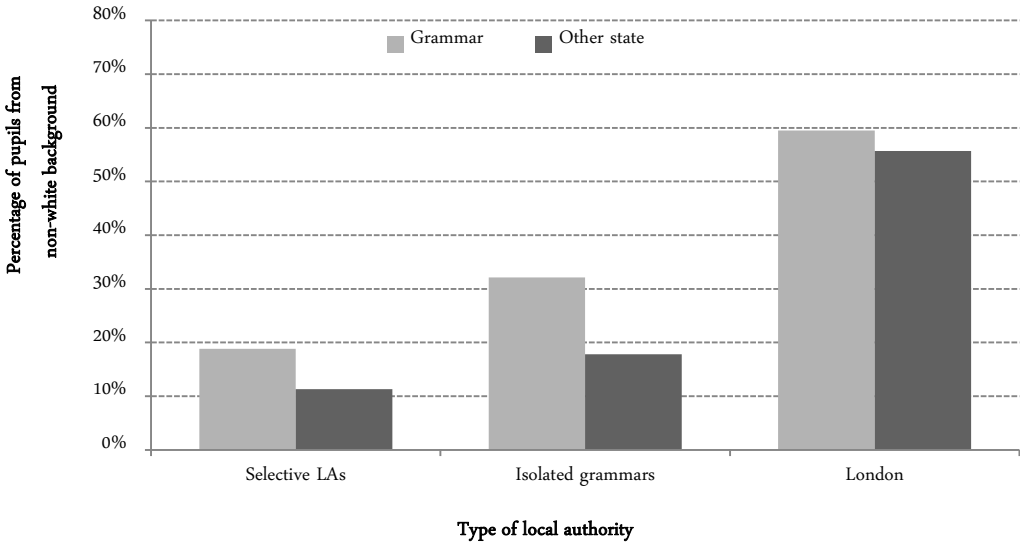
Note: As reported in Tables A.1–A.3, the differences between grammar and other state schools are all statistically significant at the 1% level.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

As we have already seen, a lower proportion of pupils in London attend grammar schools than in selective local authorities and there is more evidence of pupils crossing local authority borders to attend grammar schools in London. It is therefore perhaps not surprising that London grammar schools are more selective along socio-economic dimensions. What is more surprising is the fact that there appears to be a similar gap in terms of FSM eligibility across selective local authorities and isolated grammar schools outside of London. One might have expected isolated grammar schools to be more selective and to show similar patterns to those seen for London. This is not evident in the data.

Across each type of local authority, we also see that the proportion of pupils from non-white backgrounds is higher in grammar schools than in non-grammar schools (see Figure 3.2). In other words, relative to their representation in the pupil population as a whole, non-whites are over-represented in grammar schools. The magnitude of this gap is largest for isolated grammar

schools. The detailed data in Tables A.1–A.3 reveal that in non-London local authorities, this difference is mostly driven by larger proportions of pupils from Asian and Chinese backgrounds at grammar schools. In London, the ethnic mix is very different from that in the rest of England. Here, we again see larger proportions of pupils from Asian and Chinese backgrounds attending grammar schools. This is also true for the non-London isolated grammar schools, although of course the level of participation by minority ethnic students is much lower due to differences in population demographics. However, in London and in areas with isolated grammars, we see a lower proportion of pupils from black backgrounds at grammar schools than at other schools.

Figure 3.2. Percentage of Year 7 pupils from non-white backgrounds at grammar and other state-funded schools, 2009–10 to 2011–12



Note: As reported in Tables A.1–A.3, the differences between grammar and other state schools are all statistically significant at the 5% level or more.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Previous research has shown that pupils from minority ethnic backgrounds tend to outperform children from white backgrounds once one controls for socio-economic background (Wilson, Burgess and Briggs, 2011). Here, we see that pupils from non-white backgrounds are more likely to attend a grammar school even before we control for other aspects of their background. This is a strong finding and could possibly result from differences in educational attitudes and aspirations.

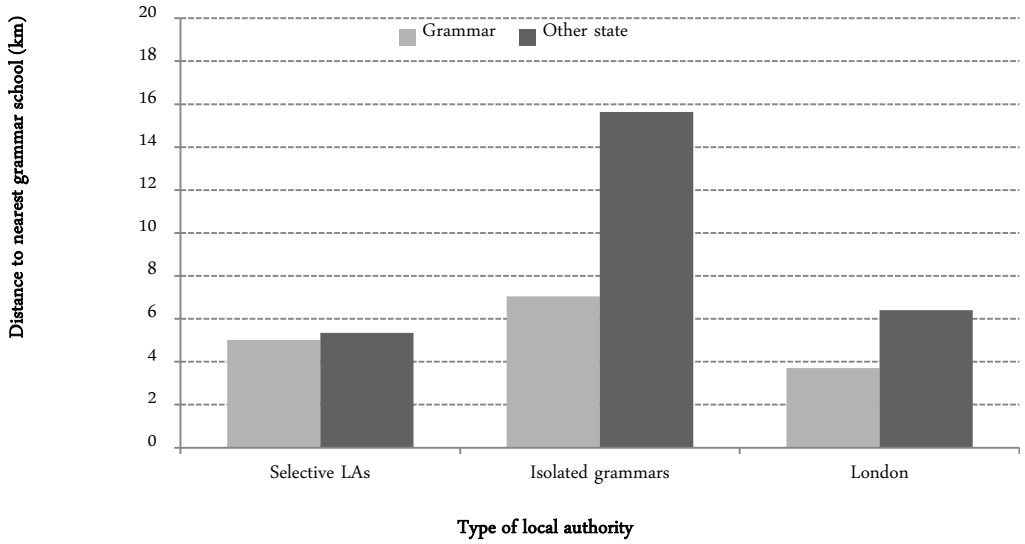
Tables A.1–A.3 also show that there are differences across grammar and non-grammar schools in terms of when children are born. Grammar schools contain about 3–4 percentage points more pupils born in the autumn than non-grammar schools and about 3–4 percentage points fewer pupils born in the summer. There are a number of potential explanations for such a pattern. We know from other research that summer-born children perform worse on national tests because they are younger (see Crawford, Dearden and Greaves (2013)). However, tests for entry to grammar school are often age normalised in an attempt to account for this pattern. Therefore, the differential pattern across quarter of birth could reflect an application effect if the relative low performance of summer-born children relative to their year group makes summer-born children less likely to apply to grammar schools (either because of their own

beliefs or because of lower teacher expectations). It might also reflect imperfect age normalisation of grammar school entry tests. Therefore, in later analysis, we ask whether these patterns change once we account for KS2 results.

Outside of London, the proportions of pupils with English as an additional language are similar at grammar and non-grammar schools. This is quite a striking finding as it suggests that not speaking English as a first language does not appear to be a significant barrier to attending a grammar school in these areas, possibly because of a focus on analytical skills in entry exams. Within London, there is a different story, with 10 percentage points fewer pupils with English as an additional language at grammar than at non-grammar schools. This may reflect the lower achievement of students who have English as an additional language; therefore we assess the robustness of this finding when we take account of pupils' prior achievement at KS2.

In terms of special educational needs, very few pupils with statements of special educational needs attend grammar schools (less than 0.5% at grammar schools, compared with 4–5% at non-grammar schools). There is also a lower proportion of pupils with School Action or School Action Plus at grammar schools than at non-grammar schools, with around 1.5–3.5% at grammar schools and well over 20% at non-grammar schools. This may reflect the lower achievement of students who have SEN and hence we assess the robustness of this finding when we take account of pupils' prior achievement at KS2.

Figure 3.3. Average distance to nearest grammar school for pupils currently attending grammar and other state-funded schools, 2009–10 to 2011–12



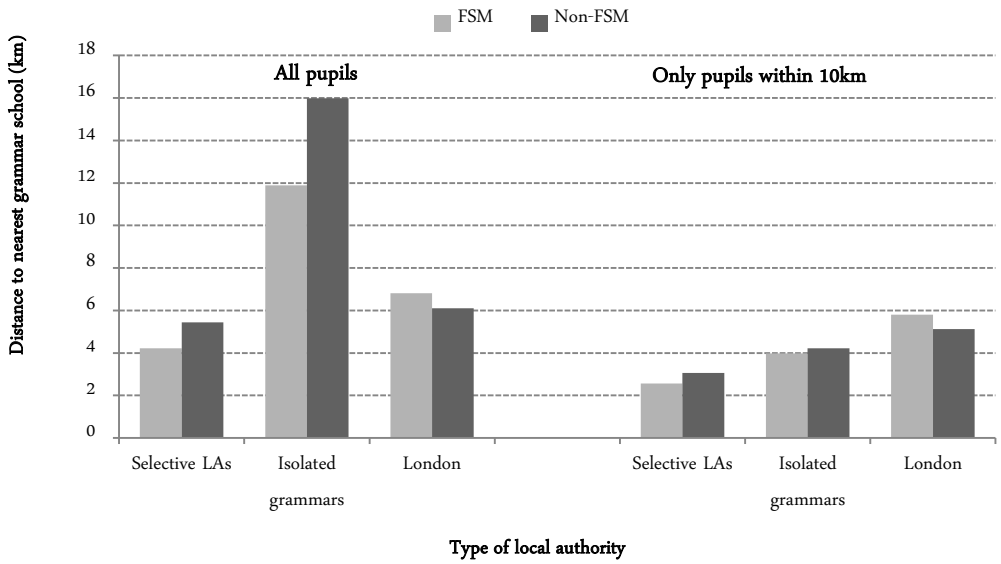
Note: As reported in Tables A.1–A.3, the differences between grammar and other state schools are all statistically significant at the 5% level or more.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Distance may act as a barrier to being able to attend a grammar school, particularly in the case of isolated grammar schools, which may be a long way away from where some pupils live. In Figure 3.3, we therefore show the average distance to the nearest grammar school for pupils

attending grammar and non-grammar schools in Year 7,[4] again separately by the three types of authority. This shows very little difference for pupils at grammar and non-grammar schools in selective authorities. This is not surprising as there are more grammar schools within these authorities. For isolated grammar schools, we see that the average distance to the nearest grammar school is much greater for all pupils, which should not be surprising. However, we now see that pupils attending non-grammar schools live about twice as far away from a grammar school as pupils who are at grammar schools in these areas. This suggests that distance could potentially be a barrier to grammar school attendance in such areas. In London, it also seems as if pupils attending grammar schools live much closer to grammar schools than pupils attending non-grammar schools.

Of particular interest is whether distance to the nearest grammar school is higher for poorer pupils than for their richer counterparts. Figure 3.4 shows that this is not the case for pupils outside of London. Pupils eligible for free school meals actually live nearer to grammar schools than pupils who are not eligible in these areas. In London, pupils eligible for FSM live slightly further away from grammar schools. If we only look at pupils who live within 10 kilometres of a grammar school, we see that the distance to the nearest grammar school is actually very similar for pupils eligible for FSM and other pupils across all three types of local authority.

Figure 3.4. Average distance to nearest grammar school by FSM eligibility, 2009–10 to 2011–12



Note: The differences between pupils eligible and not eligible for free school meals are statistically significant at the 1% level in all six cases.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

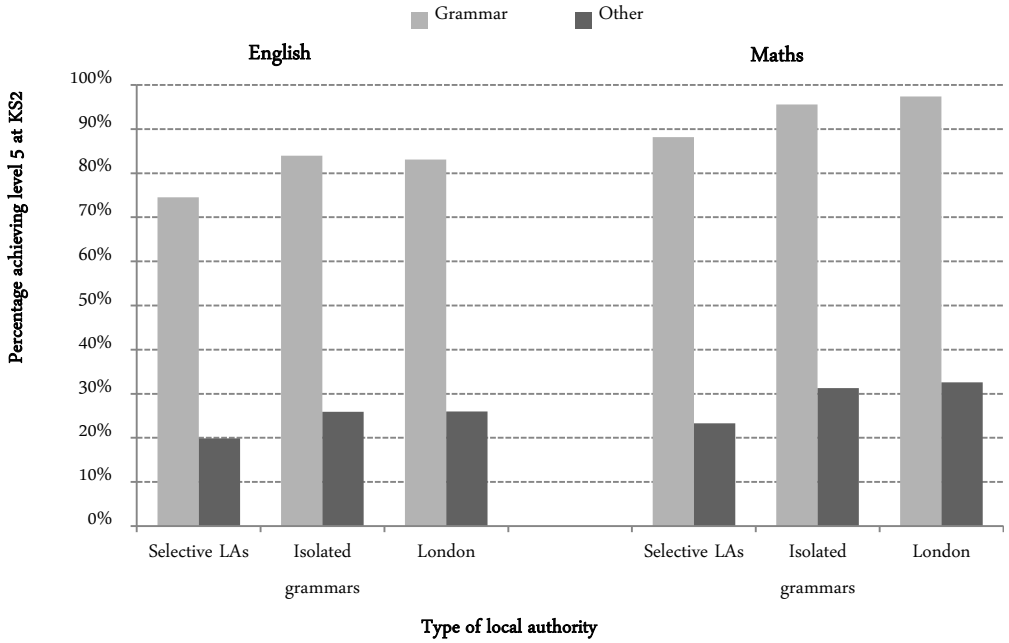
Therefore, with the exception of London, it does not seem as though grammar schools are located nearer richer pupils. However, the distances are still relatively large for both groups. As

[4] Here, we are measuring distance to nearest grammar school based on pupils' residential location in Year 7. We acknowledge that parents could move nearer to a grammar school if pupils gain entry.

such, the cost of travelling to a grammar school every day could still act as a barrier for poorer pupils.

Given that grammar schools select by academic ability, we would also expect pupils attending grammar schools to have achieved higher results at Key Stage 2. It is important to note here that, while previously-studied characteristics such as FSM eligibility are observable in Year 7 (and are therefore observable for all pupils in grammar schools and other state schools), attainment is measured by Year 6 tests. Therefore, any pupil who was not in the state school system in Year 6 does not have a KS2 attainment record. Furthermore, due to the boycott of KS2 examinations in 2010–11, we only examine differences in the 2009–10 and 2011–12 cohorts.

Figure 3.5. Percentage of Year 7 pupils who have achieved level 5 in English and maths at KS2 at grammar and other state-funded schools, 2009–10 and 2011–12



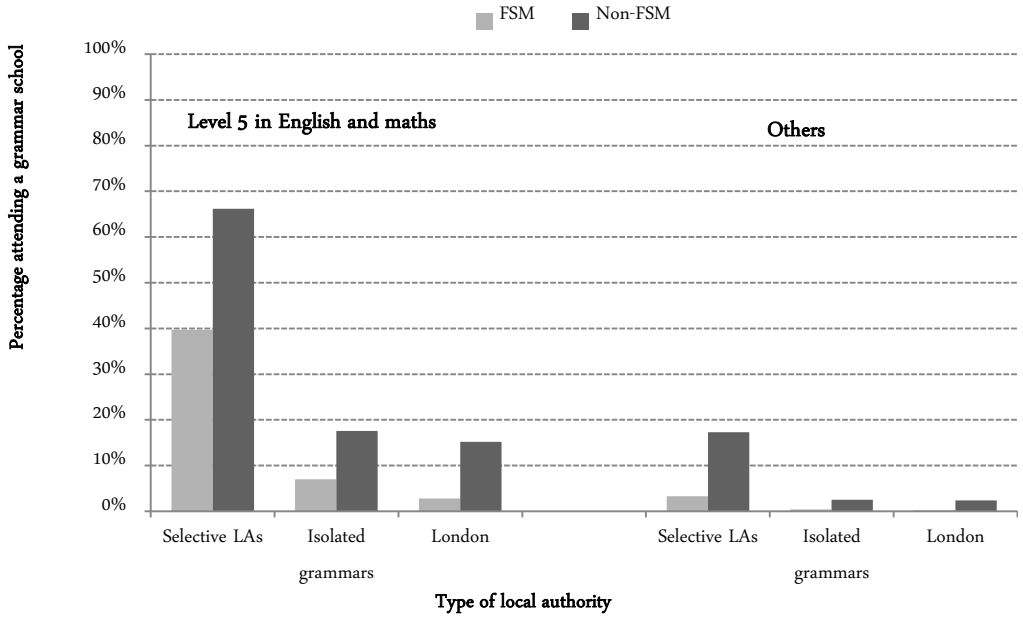
Note: The differences between grammar and other state schools are all statistically significant at the 1% level.
Source: Authors' calculations using the National Pupil Database, 2009–10 and 2011–12.

Having noted these caveats, Figure 3.5 makes clear that, again unsurprisingly, grammar school pupils do indeed have higher test scores. It shows that the proportion who have achieved level 5 in maths or English is higher in grammar than in non-grammar schools. However, two other facts emerge. First, and perhaps unsurprisingly, the proportion achieving level 5 in either subject is higher in London and isolated grammar school areas than in selective local authorities. This may just reflect the fact that KS2 performance in these areas is generally higher, on average. Indeed, the absolute gaps between grammar and non-grammar schools in these areas are very similar. Second, achieving level 5 in maths appears to be a better predictor of going to a grammar school than achieving level 5 in English. Although the proportions achieving level 5 in maths are higher in non-grammar schools as well, the absolute difference between grammar and non-grammar schools is higher for maths than it is for English. The reason for this discrepancy may be that grammar schools use admission tests that favour mathematical and analytical ability more than language skills. Alternatively, however, it might

be that students who are seen as able in maths are more likely to be identified by parents and teachers as able, and hence will be more likely to apply to a grammar in the first place.

One of the reasons why more disadvantaged pupils might be less likely to attend a grammar school is their lower educational achievement up to age 11, on average. Therefore, it is also important to consider whether pupils who achieve high KS2 results are equally likely to go to a grammar school irrespective of their socio-economic background. Figure 3.6 addresses this question by showing the probability that Year 7 pupils attend a grammar school given that they have achieved level 5 in English and maths at KS2, shown separately for pupils eligible and not eligible for FSM. It demonstrates that even if pupils achieve level 5 in English and maths, those eligible for FSM are still less likely to attend a grammar school than pupils not eligible for FSM. The effect is larger for isolated grammar schools and in London. Indeed, in London, 15% of pupils not eligible for free school meals attend a grammar school if they got level 5 in both subjects, compared with less than 3% of pupils with level 5 in both subjects who are eligible for free school meals. We explore these relationships further in a multivariate context, using finer measures of prior academic achievement, in Section 4.

Figure 3.6. Percentage of pupils attending a grammar school, by FSM eligibility and KS2 attainment, 2009–10 and 2011–12

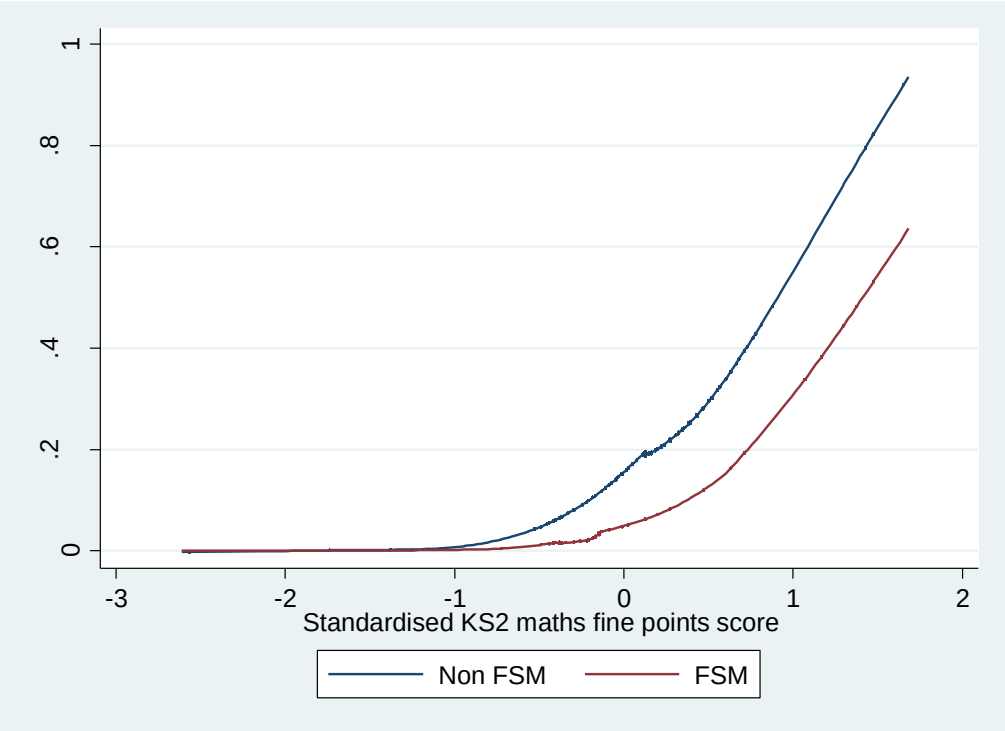


Note: The differences between pupils eligible and not eligible for free school meals are statistically significant at the 0.1% level in all six cases.
Source: Authors' calculations using the National Pupil Database, 2009–10 and 2011–12.

Although it is interesting to look at the overall attainment differences between grammar school pupils and other pupils, the relationship between test scores and entrance to grammar schools is unlikely to be a simple linear one. Since grammar schools are highly selective, it seems unlikely that the difference in probability of entering between pupils with average and low test scores is as large as between those with very high test scores and those at the mean. Furthermore, the relationship may also differ across pupils from higher and lower socio-economic backgrounds.

To grasp whether this is indeed true, we use an alternative measure of Key Stage 2 achievement – the fine points score, which measures how well a pupil did on the test rather than their level. This points score is standardised to have mean 0 and a standard deviation of 1 in each year (nationally). Using a local linear regression,[5] we can estimate the probability of entering grammar school for any level of maths attainment; we do this separately for pupils who are FSM eligible and those who are not. The results are shown in Figure 3.7 for pupils in selective local authorities; the equivalent results for local authorities with isolated grammar schools and for London can be found in Appendix Figures A.1 and A.2.[6]

Figure 3.7. Probability of attending a grammar school for FSM and non-FSM pupils in selective local authorities, given KS2 maths points score, 2009–10 and 2011–12



Source: Authors' calculations using the National Pupil Database, 2009–10 and 2011–12.

This highlights that for pupils with a test score one standard deviation below the mean,[7] there is effectively no chance of them attending a grammar school whether or not they are eligible for FSM, which is not surprising. The relationship between FSM and entrance to grammar schools changes as the test scores increase. Two points are evident. First, for any given level of maths attainment, pupils who are eligible for FSM have a noticeably lower probability of attending a grammar school. Indeed, a non-FSM student with an average maths score[8] has the same probability of entering a grammar school as an FSM pupil with a score 0.7 standard deviations

[5] For more details, see Härdle and Linton (1994) and Cleveland (1979).

[6] Although not shown here, the pattern of results is very similar when we use the English fine points score.

[7] 'Standardised score of –1' in Figure 3.7.

[8] Standardised score of 0.

above average. Second, the gap in probability of attendance between FSM and non-FSM pupils actually widens substantially: non-FSM pupils with test scores one standard deviation above average[9] have a 55% likelihood of attending a grammar school in selective local authorities, whereas similar pupils who are eligible for FSM have only a 30% chance of attending a grammar school. This is suggestive that bright pupils from deprived families are not attending grammar schools as much as their attainment would suggest they might. It is possible that another variable is driving this effect, a possibility we examine in Section 4.

Primary school characteristics

Having looked at the mix of pupils at grammar schools compared with the mix in other state-funded schools, we now examine the extent to which pupils attending grammar schools also differ in terms of what sort of primary school they attended.

Appendix Tables A.4–A.6 show the average characteristics of primary schools attended by pupils who are currently in grammar and non-grammar schools, with each table showing this for a different type of local authority (selective, isolated grammar schools and London). From this broad set of statistics, a number of interesting patterns emerge:

- **Type of school** – Pupils attending grammar schools are more likely to have attended a voluntary-aided or voluntary-controlled school, and less likely to have attended a community school. Given that many voluntary-aided/controlled schools are also faith schools, it is unsurprising that pupils attending grammar schools are more likely to have attended a faith school.[10]
- **Socio-economic mix** – Pupils attending grammar schools are more likely to have attended primary schools with lower levels of average deprivation. For instance, the average proportion of pupils in the primary school eligible for free school meals is much lower as is the average proportion from the lowest IDACI quintile.
- **Ethnicity** – Outside London, there are not substantial differences in terms of the ethnic mix of the primary schools attended by pupils at grammar schools. Within London, the primary schools attended by pupils currently at grammar schools contain a higher proportion of pupils from white backgrounds.
- **SEN** – The proportion of pupils with SEN is slightly lower at the primary schools of pupils who then went on to grammar schools, in terms of both the proportion of pupils with statements of SEN and the proportion on School Action/Plus.

Given that pupils attending grammar schools tend to travel relatively long distances compared with pupils attending other schools, it also seems likely that they will come from a greater range of primary schools. Table 3.1 confirms this by showing the average number of feeder primary schools to grammar schools across the three types of local authority. The average number of distinct feeder primary schools attended by pupils at grammar schools is more than twice as high as for non-grammar schools outside of London. It is nearly three times as high for grammar

[9] Standardised score of +1.

[10] There are 20 grammar schools that are religious (all of them Christian or one its denominations). Seven of them are in selective LAs, nine in LAs with isolated grammar schools and four in London.

schools in London. The fact that grammar schools seem to cast their nets over a wider pool of primary schools is important. It means that only a very small number of pupils from any given primary school will go on to a grammar school each year. This may reduce the perceived value to primary schools from assisting pupils with grammar school admissions.

Table 3.1. Average number of feeder primary schools

	Grammar schools	Other state schools	Difference
Selective local authorities	70.1	32.7	37.3
Isolated grammar schools	120.9	52.5	68.4
London	95.2	34.5	60.7

Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

A number of pupils will have transferred into grammar schools from non-state English schools or from schools outside England. (These are pupils for whom the National Pupil Database has no record in Year 6.) They account for about 13% of Year 7 pupils currently at grammar schools, compared with a national average of 6.5% of 10-year-old students enrolled in private schools.[11] This figure is lowest for selective areas (12%), compared with 14–15% for isolated grammar schools and in London. This is consistent with a story whereby the intakes of isolated grammar schools and those in London are more selected. Furthermore, there might be greater incentives for parents to invest in private primary education in areas where there are fewer grammar schools, in order to maximise the child's chances of passing the grammar entry test or indeed because the parent feels private schooling is a preferable alternative for other reasons.

Table 3.2 shows the proportion of pupils who have transferred into grammar schools from outside the English state system by individual local authority (this is only shown for local authorities containing at least one grammar school). There is considerable variation. As we already know, the figure transferring in from outside the English state system is higher for isolated grammar schools than for selective local authorities. However, even amongst this group, there is a lot of variation. For example, over one-third of pupils transferred from outside the English state system in Essex, compared with about 7% in North Yorkshire. There are also great differences amongst selective areas, with high transfers in Bournemouth, Southend-on-Sea, Buckinghamshire and Reading and comparatively low levels in Lincolnshire. In London, the figures also vary substantially, with almost 25% of pupils transferring in from outside the English state system in Bromley but only 8% doing so in Bexley.

[11] Authors' calculations using https://www.gov.uk/government/publications/schools-pupils-and-their-characteristics-january-2013.

Table 3.2. Proportion of pupils attending grammar schools with no Year 6 record, by local authority, 2009–10 to 2011–12

	Proportion without a Year 6 record	Proportion of pupils at grammar schools	Number of schools
All	**0.025**	**0.040**	**161**
Selective local authorities	***0.122***	***0.252***	***106***
Bournemouth	0.224	0.188	2
Southend-on-Sea	0.221	0.283	4
Buckinghamshire	0.195	0.360	13
Reading	0.195	0.188	2
Trafford	0.155	0.385	7
Gloucestershire	0.134	0.126	7
Torbay	0.111	0.276	3
Slough	0.101	0.324	4
Kent	0.098	0.284	32
Calderdale	0.093	0.117	2
Wirral	0.091	0.258	6
Medway	0.085	0.275	6
Plymouth	0.075	0.148	3
Lincolnshire	0.073	0.227	15
Isolated grammar schools	***0.144***	***0.046***	***36***
Essex	0.339	0.029	4
Wiltshire	0.228	0.049	2
Devon	0.182	0.017	1
Telford and Wrekin	0.164	0.078	2
Liverpool	0.162	0.025	1
Wolverhampton	0.155	0.043	1
Birmingham	0.135	0.082	8
Warwickshire	0.110	0.079	5
Stoke-on-Trent	0.108	0.056	1
Walsall	0.106	0.056	2
Cumbria	0.089	0.022	1
Lancashire	0.078	0.041	4
North Yorkshire	0.073	0.053	3
Kirklees	0.059	0.034	1
London grammar schools	***0.145***	***0.129***	***19***
Bromley	0.242	0.073	2
Sutton	0.173	0.274	5
Barnet	0.158	0.105	3
Redbridge	0.148	0.072	2
Kingston upon Thames	0.143	0.169	2
Enfield	0.122	0.049	1
Bexley	0.080	0.221	4

Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

What sort of pupils transfer from outside the English state system? Table 3.3 displays the average characteristics of pupils who transfer into grammar schools from outside the English state system and compares these with the average characteristics of pupils who attended a state primary school. This indicates quite clearly that pupils transferring in are less deprived, on average, than other pupils attending grammar schools: only 1% are eligible for FSM and nearly 45% come from the richest 20% of areas. They are more likely to come from an ethnic minority background but less likely to have English as an additional language, less likely to have SEN and slightly more likely to be summer born. Interestingly, they also live slightly further away from their nearest grammar school, on average.

Table 3.3. Characteristics of Year 7 pupils attending grammar schools by absence or presence of Year 6 record (N = numbers attending grammar schools)

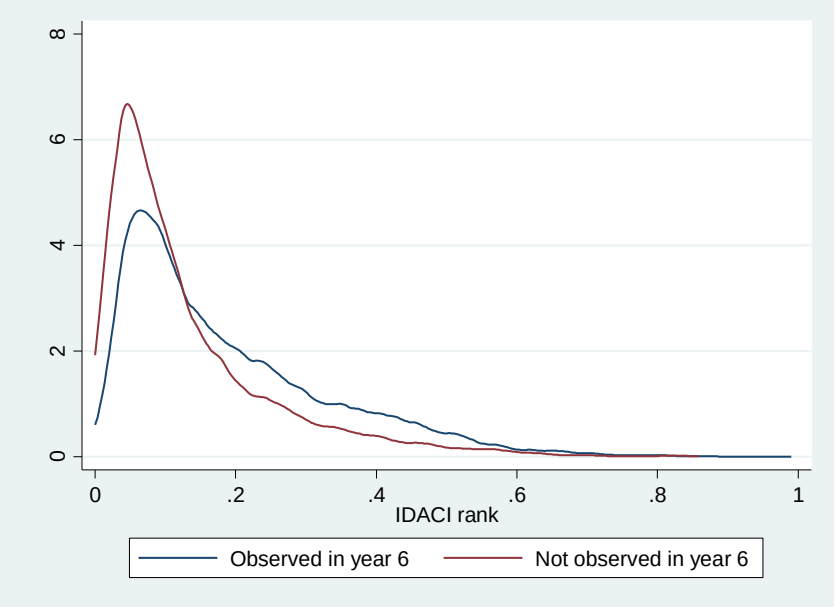
Characteristics of Year 7 pupils in grammar schools	**No Year 6 record**	**Attended state primary school**	**Difference**	**N**
Eligible for FSM in Year 7	0.009	0.032	–0.023***	65,820
Poorest IDACI quintile	0.033	0.061	–0.029***	65,820
2nd-poorest IDACI quintile	0.084	0.134	–0.050***	65,820
Middle IDACI quintile	0.177	0.208	–0.031***	65,820
2nd-richest IDACI quintile	0.270	0.272	–0.002***	65,820
Richest IDACI quintile	0.436	0.325	0.111***	65,820
White background	0.678	0.743	–0.065***	65,820
Asian background	0.180	0.143	0.037***	65,820
Black background	0.032	0.028	0.005***	65,820
Chinese background	0.019	0.015	0.004***	65,820
Mixed ethnicity	0.062	0.046	0.016***	65,820
Other ethnicity	0.028	0.026	0.002***	65,820
Autumn born	0.272	0.284	–0.012***	65,820
Winter born	0.244	0.249	–0.005***	65,820
Spring born	0.246	0.242	0.004***	65,820
Summer born	0.239	0.225	0.013***	65,820
Has English as an additional language	0.093	0.117	–0.024***	65,403
SEN statement (Year 7)	#	#	#	65,820
SEN School Action/Plus (Year 7)	0.028	0.033	–0.005***	65,820
Distance to nearest grammar school (km)	5.93	5.13	7.99***	65,820

Note: Where cell sizes are sufficiently small to be potentially disclosive, entries are marked with the symbol #.
*** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.
Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

To get a greater understanding of the relative backgrounds of grammar school pupils who were and were not in an English state school in Year 6, we compare pupils' IDACI scores. The IDACI score measures the income deprivation of their very local area (super output area), where 0 is

the least deprived area in the country and 1 is the most deprived. Figure 3.8 shows that the distribution of IDACI scores differs for pupils in grammar schools depending on whether or not they were in an English state school in Year 6. While grammar school pupils are more likely to come from relatively affluent areas, those who have transferred into the state sector to a grammar school are particularly likely to be in the least deprived 10% of areas in the country, and are in particular less likely to be from areas that are between the 10% and 60% least deprived.

Figure 3.8. IDACI rank of grammar school pupils in selective local authorities, for pupils observed in the National Pupil Database in Year 6 and those who are not



Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

The equivalent analysis for London and for local authorities with isolated grammar schools can be found in Appendix Figures A.3 and A.4. It is interesting to note that for isolated grammar schools, there is not such a striking difference in IDACI scores for those who were/were not observed in Year 6. In London, those who were not observed in Year 6 look less deprived than those who were, although many more people live in more deprived areas in London.

In summary, there seems to be a sizeable number of pupils transferring into grammar schools from outside the English state system (about 12–15% of grammar intakes). These pupils tend to be richer, on average, than other pupils attending grammar schools. There also seems to be quite a lot of difference across individual local authorities. Some of the smaller selective local authorities, such as Bournemouth, Southend-on-Sea and Reading, as well as local authorities with isolated grammar schools (e.g. Essex and Wiltshire) display the highest proportions of pupils from outside the English state system.

Unfortunately, we are unable to distinguish whether these transferring students are largely from the private sector or from abroad. However, in further analysis, we have found that the

pattern is extremely similar if we restrict attention to pupils from white-British backgrounds.[12] This indicates that pupils coming from outside the English state system are largely from white-British backgrounds, suggesting that the pattern is less likely to be driven by immigration. Furthermore, Table 3.3 showed that less than 10% of pupils transferring into state sector grammar schools had English as an additional language.

4. Multivariate regression analysis

As we have seen, there are large differences in the characteristics and attainment levels between pupils attending grammar schools and other pupils in their local authorities. However, many of these characteristics are correlated. It is therefore unclear whether poorer pupils are less likely to attend grammar schools because they come from poor families or because they possess other characteristics that affect their chances of going to a grammar school – for example, lower levels of attainment or living further away from a grammar school. The answer to this question is important as it points to the mechanism driving the lower probability of attending a grammar school amongst poorer pupils.

To shed light on what really makes pupils more likely to attend grammar schools, we use multivariate regression analysis. While we would not want to attach a causal interpretation to these results, they allow us to estimate the change in probability of attending a grammar school associated with, for example, being eligible for FSM compared with not being eligible, allowing for other observable characteristics.

In our analysis, we restrict attention to pupils who have achieved at least level 4 in both their English and maths tests at Key Stage 2. This is because it is very unlikely that anyone with less than this 'expected' attainment will gain a place at a selective grammar school, as can be seen from Figure 3.6. We also exclude all pupils who were not in an English state school in Year 6. This is because we are not able to control for their attainment at KS2, and their inclusion would bias our estimates.[13] Of course, many such pupils come from relatively well-off families. Our estimates of socio-economic differences are thus likely to be smaller than the true differences.

We estimate five separate specifications, all of which have a slightly different sample or control for a different number of background variables. Models 1 to 3 estimate the effects for pupils who achieved level 4 in both English and maths at KS2. They differ in the variables that they control for. Model 1 controls only for individual characteristics, such as FSM eligibility, ethnicity and distance from the nearest grammar school. Model 2 includes controls for Key Stage 2 attainment. Attainment is taken account of in a flexible manner, recognising that the relationship between prior attainment and grammar school attendance may be highly non-linear. Specifications that take attainment into account allow for a quadratic relationship between standardised test scores, with a separate quadratic relationship for pupils with above-average attainment; this is done separately for English and maths. Furthermore, they allow for a

[12] Due to the high degree of similarity, we are unable to show these data as it may result in secondary disclosure of confidential information in some smaller local authorities.

[13] Due to the prime importance placed upon controlling for attainment in these models, we also exclude any data from the 2010–11 cohort, as we did in examining the differences in average attainment in Section 3.

separate effect for achieving level 5 in both English and maths at KS2. Model 3 also introduces a number of primary school characteristics.[14]

Models 4 and 5 control for the same set of variables as model 3, but restrict attention to subsets of the pupil population, with higher prior attainment. Model 4 focuses attention only on those with level 5 in at least one of English and maths, while model 5 is restricted to those with level 5 in both subjects. From a policy perspective, it may well be more concerning if poorer pupils are significantly less likely to attend grammar schools, despite having high achievement.

We produce separate estimates for each of the three types of local authority defined in the previous section. The results are shown in the appendix – selective local authorities in Table A.7, isolated grammar schools in Table A.8 and London in Table A.9.[15]

For the most part, we focus on the estimated relationship between FSM eligibility and the probability of attending a grammar school, and how this changes as we control for different characteristics and focus on different groups of pupils. However, we do also discuss how other characteristics affect the probability of attending a grammar school.

Deprivation

The first row of Table A.7 indicates that amongst pupils in selective local authorities who achieved level 4 in English and maths at KS2, pupils eligible for FSM are 13.4 percentage points less likely to attend a grammar school, according to model 1. However, this difference is more than halved when we control for differences in attainment as well in model 2, with the effect reducing to about 5.5 percentage points. A further small part of the effect can also be explained by the types of primary schools attended by poorer pupils, as seen in model 3. There are also sizeable differences according to the level of deprivation in a pupil's neighbourhood, as measured by quintile of the IDACI index. For example, once we allow for differences in prior attainment across students, those living in an area in the most deprived 20% of neighbourhoods are 13.1 percentage points less likely to go to a grammar school than pupils in the top quintile.

We then focus our attention on pupils who have achieved level 5 in one subject (model 4) or both subjects (model 5). The effect of FSM eligibility is now estimated to be much larger than in model 3. This mainly results from the fact that grammar school entry is simply much higher on average amongst pupils achieving level 5 in one or both subjects (as can be seen in Figure 3.7, the absolute gap in the probability of attendance is increasing in the Key Stage 2 maths fine points score). Indeed, the estimated FSM gap is over 12 percentage points amongst pupils who achieve level 5 in both subjects. The magnitude of this gap is thus three times larger when we focus just on those achieving level 5 in English and maths, as compared with all students at level 4 or above.

[14] Each of the primary school characteristics is calculated separately for each pupil, so that it is really the average characteristics of a pupil's peers at primary school and is unaffected by the pupil's own characteristics.

[15] All regression results also contain fixed effects for the local authority in which a pupil lives and for the cohort to which they belong. These effects are not reported.

Therefore, in selective local authorities, pupils eligible for FSM are much less likely to attend grammar schools. A good proportion of this gap can be explained by the fact that poorer pupils display lower levels of academic achievement by age 11, and are thus presumably less likely to pass entrance exams. However, amongst those pupils with high levels of academic attainment, poorer pupils are still much less likely to attend grammar schools.

Table A.8 repeats this analysis for isolated grammar schools. The first point to note is that the estimated effects are much smaller in absolute terms, precisely because fewer pupils attend grammar schools in these areas. The absolute magnitudes are thus not directly comparable to those in Table A.7. However, we do observe some very similar patterns. Amongst pupils who have achieved level 4 in English and maths at KS2, pupils eligible for FSM are less likely to attend grammar schools. A sizeable amount of this gap can be explained by differences in academic achievement and a further small proportion by the types of primary school attended. Again we see that the estimated FSM gap increases when we look only at pupils achieving level 5 in one or both subjects.

The story for this second group of local authorities thus appears to be the same. Pupils eligible for FSM are less likely to attend grammar schools largely because they have lower levels of academic achievement by age 11. However, the small number of poorer pupils who do get the highest levels of achievement at age 11 are still less likely to attend a grammar school than richer pupils with similar levels of attainment.

The third set of results, in Table A.9, shows this familiar pattern for the London area. Again, we see that amongst pupils achieving level 4 in both subjects, those eligible for FSM are less likely to attend grammar schools (by about 2 percentage points in model 1). The vast majority of this gap is explained by differences in achievement by age 11. However, amongst pupils with high levels of academic achievement, pupils eligible for FSM are still less likely to attend grammar schools.

Key Stage 2 attainment

Given that grammar schools explicitly select upon academic ability, it is to be expected that those with higher academic test scores are more likely to enter grammar schools. As was shown in Section 3, and in particular in Figure 3.6, going to a grammar school is almost predicated upon having above-average academic results, and therefore there is not a simple linear relationship between test scores and attendance. This makes interpretation of the results complex. For example, in selective local authorities, higher test scores in English or maths have no significant effect on attendance when these scores are below the national average (see models 2 and 3 in Table A.7). This may appear counter-intuitive but it simply reflects the fact that almost no pupils with below-national-average attainment, regardless of their FSM status, attend a grammar school. So when comparing two pupils who achieve below the national average, the one with the marginally higher test score does not have a significantly higher probability of admission. Above the national average, however, those with higher test scores are much more likely to attend a grammar school than those who have lower test scores, with high maths scores having a particularly positive impact on attendance probability (see the interacted terms in models 2 and 3, and also models 4 and 5, in Table A.7). So when comparing two pupils

with above-average test scores, the one with the higher scores, particularly in maths, will be significantly more likely to attend a grammar.

Pupils with high attainment may have a higher probability of attending grammar schools for a number of reasons. First, they may be more likely to apply, either because they have a preference to attend a high-performing school with other bright children or because they are more strongly encouraged to apply, by their parents and/or by their primary school. Second, conditional upon applying, high-achieving children are more likely to do well in the entrance tests, and therefore are more likely to gain admission to a grammar school. As such, the effect of KS2 attainment may be a combination of a greater chance of applying and, having done so, a greater chance of passing the entrance exam.

Other characteristics

Across all the specifications, the pupil's ethnicity, conditional on other background variables, plays an important role in determining whether a pupil attends a grammar school. Pupils from all non-white ethnicities are more likely to attend a grammar school (in all areas) than similar white pupils.[16] This trend is particularly strong for pupils from Asian and Chinese backgrounds: for example, in selective local authorities, they are 17.3 and 18.1 percentage points more likely to attend a grammar school, conditional upon achieving KS2 level 4 in English and maths. However, black pupils and children of mixed ethnic background are also more likely to attend grammar schools than their white counterparts, albeit that the magnitudes of the differences are less, at 8.8 and 4.7 percentage points respectively.[17]

Our data do not allow us to explain definitively why minority ethnic students are more likely to attend grammar schools. It is possible that there are cultural preferences towards education that could lead to higher attendance at grammar schools. If a greater weight is placed upon entering a selective school, these pupils may prepare more for entrance tests than white children do. A greater preference for a selective education could lead to pupils from ethnic minority backgrounds being more willing to travel further to a grammar school than similar white children. It is also possible that high-ability minority ethnic children are more likely to be encouraged to apply for entry into a grammar school, perhaps because the primary school they attended is generally more likely to enter children into the grammar test (this may be true of some faith schools, for example).

Distance from the nearest grammar school also has a significant effect on attending grammar schools. For children in selective local authorities, living 1 kilometre further away from their nearest grammar school reduces the probability of attending a grammar school by between 1 and 2 percentage points, depending on the exact specification.

Comparing model 1, which does not control for KS2 attainment, with model 2, which does, illuminates the interesting relationship between month of birth and grammar school

[16] With the exception of 'other ethnicity' among selective local authorities in model 5.

[17] When we only examine pupils achieving level 5 in maths and/or English, these gaps are larger in absolute value for London and non-selective areas. This is likely to reflect the fact that pupils with very high KS2 results have a higher absolute chance of attending a grammar school. However, the picture is somewhat mixed for selective local authorities.

attendance. In all three areas, summer-born pupils are significantly less likely (2.9 percentage points in selective local authorities) to attend grammar schools than those born in the autumn, when only controlling for their individual characteristics. However, upon controlling for attainment, the sign of this relationship reverses: conditional on KS2 attainment (and other individual characteristics), summer-born pupils are 3.9 percentage points more likely to attend grammar schools than autumn-born pupils. This could reflect imperfect age normalisation, or it may reflect summer-born pupils who achieve very high KS2 results having higher underlying levels of ability.

Controlling for attainment also helps to explain why children with SEN are much less likely to attend grammar schools. In all three areas, not controlling for attainment, SEN pupils are significantly less likely to attend a grammar school. However, once KS2 achievement is included in model 2, there is no significant difference in attendance for pupils with statements of SEN in London or local authorities with isolated grammar schools, and there is a significant but much smaller negative relationship in selective local authorities (–3.6 percentage points as opposed to –15 percentage points).

In the raw data, students who have English as an additional language are more likely to attend a grammar school, which may appear surprising. However, in models that control for other characteristics, including ethnicity and distance to a grammar school, such pupils are less likely to attend. This may reflect the fact that students who have English as an additional language are more likely to be from a minority ethnic group and to live nearer grammar schools; once we allow for these factors, they are less likely to enrol in a grammar school. The fact that they are marginally less likely to enrol in selective areas, however, is explained by their lower prior attainment: in the specifications that restrict to those with KS2 level 5 in English and/or maths, students who have EAL are no more or less likely to attend a grammar than other students. However, in London and isolated grammar schools, even controlling for attainment in KS2 levels, children with EAL are less likely to attend grammar schools. One explanation for this difference across areas could be that grammar school intakes are more selected in areas with fewer intakes due to the higher competition for places, and that Key Stage 2 scores do not fully capture very high ability or that pupils with EAL have less coaching for tests. Another explanation could be that children from families who have English as an additional language are less likely to apply to grammar schools when the whole system is not selective, as this would require an active choice on behalf of parents.

Primary school characteristics

Models 3 to 5 all include various primary-school-level characteristics. The proportions of a pupil's peers with various characteristics are entered into the regression. We have already seen that eligibility to FSM and being white are associated with lower probabilities of attending a grammar school, even controlling for prior attainment. Moreover, results from model 3 imply that having a greater proportion of peers who are white, have SEN or EAL, or are eligible for FSM makes pupils less likely to go to grammar schools. There are a number of possible reasons for this. It could be that our models are unable to allow properly for individuals' levels of deprivation. Hence the characteristics of their primary school may be a proxy for unobserved aspects of their deprivation and hence these measures are correlated with the individual's own likelihood of attending a grammar school.

Alternatively, it could be that being in a class with more children who have SEN or EAL or who are eligible for FSM actually reduces the likelihood of the pupil themselves attending a grammar. This might be because the deprivation of other pupils causes disruption in a class and less learning, or because their teacher may need to allocate more of their time towards helping those with SEN or EAL. It might, however, be a peer effect, so that being in such an environment actually reduces either the likelihood of applying to go to a grammar school or a pupil's success in the examination. It is not possible at the moment to distinguish the mechanisms underlying these results with these data.

On the other hand, in all three models, although a pupil's own attainment is positively associated with attending a grammar school, the attainment of peers in primary school is negatively correlated with attending a grammar school. In selective local authorities, pupils with at least level 4 English and maths are 0.8 percentage points less likely to go to a grammar school if the proportion of their peers who achieve level 5 in English and maths rises by 10 percentage points. This is consistent with theories proposed by educationalists such as Herb Marsh that being with peers who are more academically able causes pupils to have lower academic self-esteem. This could possibly lead to a lower probability of applying to grammar school (because the student believes they are less likely to get in or because they do not want to be in a school where they believe that all their peers will be brighter than them). However, this is not the only potential explanation. Students who have more able peers may not be encouraged by teachers to apply to go to a grammar school as much as pupils who are some of the most able in their school. The proportion of pupils with the highest Key Stage 2 results could also proxy for other characteristics of the area, including socio-economic advantage or the perceived quality of non-grammar schools.

5. Conclusion

Our key conclusion is that there is a substantial difference in the likelihood of a child who is eligible for free school meals enrolling in a grammar school as compared with a similar child who is not eligible for FSM. This remains true even if we allow for the fact that FSM children have lower levels of prior attainment. In other words, amongst high achievers, those who are eligible for FSM or who live in poorer neighbourhoods are significantly less likely to go to a grammar school. For example, in selective local authorities, two-thirds of children who achieve level 5 in both English and maths at Key Stage 2 who are not eligible for free school meals go to a grammar school, compared with 40% of similarly high-achieving children who are eligible for free school meals. This is a substantial gap. One can observe a similar pattern of results for London and local authorities with isolated grammar schools as well. The origin of this work was a desire to consider whether some primary schools are better than others at assisting poorer children to access grammar schools. Hence it is significant that our major finding is that, across grammar schools as a whole, the proportion of children from disadvantaged backgrounds is disproportionately low, even taking account of pupils' achievement levels.

Unfortunately, we are not currently able to examine the precise mechanisms that lead to fewer pupils from poorer backgrounds attending grammar schools. We are unable to distinguish whether this results from an application effect or from a lower chance of getting in conditional on applying. Future research could examine this mechanism either by collecting data on

parental preferences for schools or by using data in the Millennium Cohort Study to see whether poorer families are also less likely to apply to grammar schools.

That said, a novel aspect of our work has been an examination of the role of primary schools in shaping children's chances of attending a grammar school. Here, we have two key findings. First, pupils have a lower chance of attending a grammar school if their primary school contained greater proportions of pupils from deprived backgrounds, with special educational needs or with English as an additional language. Second, and perhaps more surprisingly, if their primary school contained greater numbers of pupils achieving level 5 in both English and maths at Key Stage 2, pupils actually have a *lower* chance of attending a grammar school conditional on their own grades. This interesting finding is consistent with theories proposed by educationalists such as Herb Marsh that being with peers who are more academically able causes pupils to have lower academic self-esteem. This could possibly then affect the chances of students attending a grammar school if pupils are put off from applying or if they receive less attention from teachers.

Perhaps an even more striking result on primary schools is that, in some grammars, the proportion of children being admitted to the school from outside the state education system is substantial. Indeed, more than a fifth of children in some local authorities come from outside the state primary system. This may arise partly from schools admitting students from abroad, but a far more likely explanation is that these children are entering grammar schools from the private primary sector. This shows that independent fee-paying education may act as one way in which children from higher socio-economic backgrounds are assisted by their parents to gain admission to a grammar school. However, this is likely to be true for other areas of education and other outcomes, not a particular characteristic of entry to grammar schools. Unfortunately, our data do not allow us to examine this issue further, but future research might usefully focus on exploring why such a high proportion of children enter state grammar schools from the private system. It may be that parents see grammar schools as a cheaper alternative to private schools, or it could reflect an active investment by parents to help their children's chances of getting into a grammar school.

Another important conclusion is that the distance a pupil lives from a grammar school is a potential barrier to access. In our analysis, even allowing for other characteristics of the pupil and their primary school, those pupils who live further from a grammar school are significantly less likely to gain admission to one. Perhaps contrary to expectations, poorer pupils actually tend to live nearer grammar schools. However, the cost of travelling large distances could still be more of a barrier for poorer pupils.

Our evidence suggests that a high proportion of students enter grammar schools from outside the local authority and indeed from outside the English state primary system. This naturally implies that there is a great deal of selection in the system, particularly in the London area. This is unsurprising. If parents perceive the benefits of a grammar school to be substantial, then they will seek access to such schools for their children. This will mean demand for grammar school places will exceed supply, particularly in the case of isolated grammar schools and in London, and hence the most able children are the ones who are most likely to access such schools. However, our evidence indicates that, over and above pupil ability, there are factors beyond the control of the pupil that influence their likelihood of access. Socio-economic deprivation is the

clearest case. This implies that poor children who are also of high ability face a disadvantage in terms of accessing such schools. The role of the primary school in assisting poorer pupils to access grammar schools is likely to be key, given that poorer parents are less likely to be able to make use of additional resources from tutors, for example. However, we have shown that a small part of the gap in grammar school attendance between students from richer and poorer backgrounds can be explained by differences in the mix of students at their primary schools, with poorer pupils more likely to attend schools with peers who have a low chance of attending a grammar school. It is therefore of interest to know whether some primary schools help poorer students access grammar schools. Work by the National Centre for Social Research (see accompanying report) has investigated in more depth whether there are examples of good practice amongst primary schools or indeed grammar schools in terms of assisting poorer pupils to access grammar schools.

Appendix

Table A.1. Characteristics of Year 7 pupils attending grammar schools and other state-funded schools in selective local authorities

	Attends grammar school	Attends other state school	Difference	N
Individual characteristics of Year 7 pupils				
Eligible for FSM in Year 7	0.029	0.175	–0.146***	178,784
Poorest IDACI quintile	0.040	0.142	–0.102***	178,784
2nd-poorest IDACI quintile	0.118	0.218	–0.099***	178,784
Middle IDACI quintile	0.214	0.245	–0.031***	178,784
2nd-richest IDACI quintile	0.283	0.225	0.059***	178,784
Richest IDACI quintile	0.344	0.170	0.174***	178,784
White background	0.812	0.887	–0.076***	178,784
Asian background	0.094	0.045	0.049***	178,784
Black background	0.019	0.016	0.003***	178,784
Chinese background	0.011	0.002	0.009***	178,784
Mixed ethnicity	0.043	0.032	0.011***	178,784
Other ethnicity	0.022	0.018	0.004***	178,784
Autumn born	0.279	0.243	0.037***	178,784
Winter born	0.248	0.244	0.004**	178,784
Spring born	0.244	0.251	–0.007***	178,784
Summer born	0.229	0.262	–0.033***	178,784
Has English as an additional language	0.082	0.075	0.006***	178,261
SEN statement (Year 7)	0.003	0.050	–0.047***	178,784
SEN School Action/Plus (Year 7)	0.036	0.268	–0.232***	178,784
Distance to nearest grammar school (km)	5.02	5.35	–0.33**	178,784
No record of the pupil in Year 6[a]	0.122	0.022	0.100***	178,784
Prior attainment				
KS2 English: level 3 or below	0.002	0.230	–0.228***	112,788
KS2 English: level 4	0.249	0.560	–0.311***	112,788
KS2 English: level 5	0.745	0.199	0.546***	112,788
KS2 English: standardised fine points score	0.881	–0.206	1.087***	111,536
KS2 English: record missing	0.004	0.011	–0.007***	112,788
KS2 maths: level 3 or below	0.001	0.237	–0.237***	112,788
KS2 maths: level 4	0.114	0.507	–0.394***	112,788
KS2 maths: level 5	0.882	0.233	0.649***	112,788
KS2 maths: standardised fine points score	1.022	–0.241	1.264***	111,587
KS2 maths: record missing	0.004	0.022	–0.019***	112,788
Achieved level 5 English & maths	0.685	0.113	0.572***	112,788
FSM eligible + Level 5 English & maths	0.019	0.009	0.010***	112,788
Lowest IDACI quintile + Level 5 Eng & maths	0.026	0.009	0.016***	112,788
Number of schools	*106*	*388*		

[a] Indicates that pupil did not attend an English state-funded school in Year 6.

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Table A.2. Characteristics of Year 7 pupils attending grammar schools and other state-funded schools in local authorities with isolated grammar schools

	Attends grammar school	Attends other state school	Difference	N
Individual characteristics of Year 7 pupils				
Eligible for FSM in Year 7	0.030	0.188	–0.158***	269,710
Poorest IDACI quintile	0.080	0.205	–0.126***	269,710
2nd-poorest IDACI quintile	0.101	0.187	–0.085***	269,710
Middle IDACI quintile	0.164	0.197	–0.033***	269,710
2nd-richest IDACI quintile	0.265	0.216	0.049***	269,710
Richest IDACI quintile	0.390	0.195	0.194***	269,710
White background	0.679	0.822	–0.143***	269,710
Asian background	0.209	0.095	0.114***	269,710
Black background	0.021	0.027	–0.006***	269,710
Chinese background	0.015	0.002	0.012***	269,710
Mixed ethnicity	0.047	0.035	0.013***	269,710
Other ethnicity	0.029	0.019	0.010***	269,710
Autumn born	0.292	0.250	0.043***	269,710
Winter born	0.248	0.245	0.003	269,710
Spring born	0.240	0.250	–0.010***	269,710
Summer born	0.220	0.256	–0.036***	269,710
Has English as an additional language	0.124	0.106	0.018***	269,004
SEN statement (Year 7)	0.002	0.040	–0.038***	269,710
SEN School Action/Plus (Year 7)	0.029	0.214	–0.186***	269,710
Distance to nearest grammar school (km)	7.04	15.64	–8.60***	269,710
No record of the pupil in Year 6[a]	0.144	0.019	0.125***	269,710
Prior attainment				
KS2 English: level 3 or below	0.001	0.196	–0.195***	174,197
KS2 English: level 4	0.158	0.538	–0.380***	174,197
KS2 English: level 5	0.840	0.259	0.580***	174,197
KS2 English: standardised fine points score	1.026	–0.063	1.089***	172,666
KS2 English: record missing	0.002	0.007	–0.005***	174,197
KS2 maths: level 3 or below	0.001	0.197	–0.196***	174,197
KS2 maths: level 4	0.041	0.474	–0.433***	174,197
KS2 maths: level 5	0.956	0.313	0.643***	174,197
KS2 maths: standardised fine points score	1.215	–0.069	1.284***	172,730
KS2 maths: record missing	0.002	0.016	–0.014***	174,197
Achieved level 5 English & maths	0.817	0.172	0.646***	174,197
FSM eligible + Level 5 English & maths	0.026	0.015	0.011***	174,197
Lowest IDACI quintile + Level 5 Eng & maths	0.066	0.022	0.044***	174,197
Number of schools	*36*	*667*		

[a] Indicates that pupil did not attend an English state-funded school in Year 6.

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Table A.3. Characteristics of Year 7 pupils attending grammar schools and other state-funded schools in London

	Attends grammar school	Attends other state school in whole of London	Difference	N
Individual characteristics of Year 7 pupils				
Eligible for FSM in Year 7	0.027	0.289	–0.262***	230,796
Poorest IDACI quintile	0.119	0.451	–0.332***	230,796
2nd-poorest IDACI quintile	0.214	0.261	–0.047***	230,796
Middle IDACI quintile	0.208	0.139	0.069***	230,796
2nd-richest IDACI quintile	0.223	0.090	0.133***	230,796
Richest IDACI quintile	0.236	0.060	0.176***	230,796
White background	0.405	0.443	–0.038**	230,796
Asian background	0.343	0.178	0.165***	230,796
Black background	0.090	0.215	–0.125***	230,796
Chinese background	0.040	0.005	0.035***	230,796
Mixed ethnicity	0.078	0.085	–0.007**	230,796
Other ethnicity	0.044	0.074	–0.030***	230,796
Autumn born	0.281	0.249	0.032***	230,796
Winter born	0.250	0.247	0.003	230,796
Spring born	0.238	0.246	–0.008	230,796
Summer born	0.231	0.258	–0.027***	230,796
Has English as an additional language	0.275	0.376	–0.101***	227,970
SEN statement (Year 7)	0.003	0.039	–0.036***	230,796
SEN School Action/Plus (Year 7)	0.017	0.244	–0.227***	230,796
Distance to nearest grammar school (km)	3.71	6.40	–2.69***	230,796
No record of the pupil in Year 6[a]	0.145	0.038	0.106***	230,796
Prior attainment				
KS2 English: level 3 or below	0.001	0.193	–0.192***	146,867
KS2 English: level 4	0.166	0.541	–0.376***	146,867
KS2 English: level 5	0.831	0.260	0.571***	146,867
KS2 English: standardised fine points score	1.009	–0.045	1.055***	144,666
KS2 English: record missing	0.003	0.005	–0.003***	146,867
KS2 maths: level 3 or below	0.000	0.195	–0.195***	146,867
KS2 maths: level 4	0.024	0.463	–0.439***	146,867
KS2 maths: level 5	0.974	0.326	0.648***	146,867
KS2 maths: standardised fine points score	1.277	–0.041	1.318***	144,627
KS2 maths: record missing	0.002	0.015	–0.013***	146,867
Achieved level 5 English & maths	0.820	0.178	0.642***	146,867
FSM eligible + Level 5 English & maths	0.024	0.028	–0.005*	146,867
Lowest IDACI quintile + Level 5 Eng & maths	0.102	0.062	0.039***	146,867
Number of schools	*19*	*562*		

[a] Indicates that pupil did not attend an English state-funded school in Year 6.

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Table A.4. Characteristics of primary schools of pupils attending grammar schools and other state-funded schools in selective local authorities

	Attends grammar school	Attends other state school	Difference	N
Characteristics of pupils' primary schools				
Voluntary aided (Year 6)	0.226	0.171	0.055***	170,136
Voluntary controlled (Year 6)	0.156	0.128	0.029***	170,136
Community (Year 6)	0.537	0.597	–0.060***	170,136
Foundation (Year 6)	0.079	0.085	–0.006	170,136
Special (Year 6)	0.000	0.016	–0.016***	170,136
Other state school (Year 6)	0.001	0.003	–0.002	170,136
Faith primary school	0.464	0.385	0.079***	170,382
Proportion of pupils at primary school who are eligible for FSM	0.090	0.156	–0.066***	170,364
Proportion of pupils at primary school who are white	0.877	0.881	–0.005	170,364
Proportion of pupils at primary school with EAL	0.079	0.087	–0.008*	170,364
Proportion of pupils at primary school with SEN School Action/Plus	0.205	0.242	–0.037***	170,364
Proportion of pupils at primary school with SEN statement	0.020	0.040	–0.021***	170,364
Proportion of pupils at primary school who are IDACI quintile 1 (poorest)	0.063	0.137	–0.074***	170,364
Proportion of pupils at primary school who are IDACI quintile 2	0.151	0.214	–0.063***	170,364
Proportion of pupils at primary school who are IDACI quintile 3	0.232	0.241	–0.009**	170,364
Proportion of pupils at primary school who are IDACI quintile 4	0.267	0.230	0.037***	170,364
Proportion of pupils at primary school who are IDACI quintile 5 (richest)	0.286	0.178	0.109***	170,364
Proportion of pupils at primary school with KS2 level 5 in English and maths	0.278	0.204	0.074***	112,774
No record of the pupil in Year 6	0.122	0.022	0.100***	178,784

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using National Pupil Database, 2009–10 to 2011–12.

Table A.5. Characteristics of primary schools of pupils attending grammar schools and other state-funded schools in local authorities with isolated grammar schools

	Attends grammar school	Attends other state school	Difference	N
Characteristics of pupils' primary schools				
Voluntary aided (Year 6)	0.292	0.223	0.069***	262,915
Voluntary controlled (Year 6)	0.184	0.131	0.054***	262,915
Community (Year 6)	0.477	0.586	–0.108***	262,915
Foundation (Year 6)	0.046	0.050	–0.004	262,915
Special (Year 6)	0.000	0.010	–0.010***	262,915
Other state school (Year 6)	0.000	0.000	–0.000***	262,915
Faith primary school	0.520	0.403	0.118***	262,939
Proportion of pupils at primary school who are eligible for FSM	0.107	0.179	–0.073***	262,889
Proportion of pupils at primary school who are white	0.791	0.823	–0.032***	262,889
Proportion of pupils at primary school with EAL	0.130	0.122	0.009	262,889
Proportion of pupils at primary school with SEN School Action/Plus	0.163	0.204	–0.041***	262,889
Proportion of pupils at primary school with SEN statement	0.019	0.034	–0.015***	262,889
Proportion of pupils at primary school who are IDACI quintile 1 (poorest)	0.116	0.205	–0.089***	262,887
Proportion of pupils at primary school who are IDACI quintile 2	0.128	0.187	–0.059***	262,887
Proportion of pupils at primary school who are IDACI quintile 3	0.177	0.200	–0.023***	262,887
Proportion of pupils at primary school who are IDACI quintile 4	0.247	0.214	0.033***	262,887
Proportion of pupils at primary school who are IDACI quintile 5 (richest)	0.332	0.194	0.138***	262,887
Proportion of pupils at primary school with KS2 level 5 in English and maths	0.275	0.194	0.081***	174,163
No record of the pupil in Year 6	0.144	0.019	0.125***	269,710

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using National Pupil Database, 2009–10 to 2011–12.

Table A.6. Characteristics of primary schools of pupils attending grammar schools and other state-funded schools in London

	Attends grammar school	Attends other state school in whole of London	Difference	N
Characteristics of pupils' primary schools				
Voluntary aided (Year 6)	0.268	0.214	0.054***	220,955
Voluntary controlled (Year 6)	0.020	0.009	0.011	220,955
Community (Year 6)	0.660	0.728	–0.068***	220,955
Foundation (Year 6)	0.051	0.035	0.017	220,955
Special (Year 6)	0.000	0.010	–0.010***	220,955
Other state school (Year 6)	0.001	0.005	–0.004***	220,955
Faith primary school	0.340	0.260	0.080***	221,040
Proportion of pupils at primary school who are eligible for FSM	0.131	0.276	–0.145***	221,030
Proportion of pupils at primary school who are white	0.605	0.446	0.159***	221,030
Proportion of pupils at primary school with EAL	0.272	0.435	–0.163***	221,030
Proportion of pupils at primary school with SEN School Action/Plus	0.197	0.251	–0.054***	221,030
Proportion of pupils at primary school with SEN statement	0.022	0.035	–0.014***	221,030
Proportion of pupils at primary school who are IDACI quintile 1 (poorest)	0.173	0.446	–0.272***	221,029
Proportion of pupils at primary school who are IDACI quintile 2	0.224	0.260	–0.036***	221,029
Proportion of pupils at primary school who are IDACI quintile 3	0.206	0.142	0.064***	221,029
Proportion of pupils at primary school who are IDACI quintile 4	0.208	0.091	0.117***	221,029
Proportion of pupils at primary school who are IDACI quintile 5 (richest)	0.188	0.062	0.126***	221,029
Proportion of pupils at primary school with KS2 level 5 in English and maths	0.297	0.207	0.090***	146,857
No record of the pupil in Year 6	0.145	0.038	0.106***	230,796

Note: *** denotes that the difference is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using National Pupil Database, 2009–10 to 2011–12.

Table A.7. Determinants of attendance at grammar schools: selective local authorities

	Model 1 Pupil chars only	**Model 2** With KS2 scores	**Model 3** With prim school chars	**Model 4** With prim school chars	**Model 5** With prim school chars
Sample:	**Level 4 plus in Eng & maths**	**Level 4 plus in Eng & maths**	**Level 4 plus in Eng & maths**	**Level 5 in Eng or maths**	**Level 5 in Eng & maths**
Pupil characteristics					
Eligible for FSM in Year 7	–0.134***	–0.055***	–0.040***	–0.088***	–0.124***
	(0.005)	(0.004)	(0.004)	(0.007)	(0.013)
2nd-poorest IDACI quintile	0.057***	0.034***	0.012***	0.019**	0.033**
	(0.006)	(0.005)	(0.004)	(0.008)	(0.015)
Middle IDACI quintile	0.118***	0.065***	0.019***	0.038***	0.061***
	(0.008)	(0.006)	(0.005)	(0.008)	(0.015)
2nd-richest IDACI quintile	0.182***	0.100***	0.043***	0.068***	0.079***
	(0.008)	(0.007)	(0.005)	(0.009)	(0.015)
Richest IDACI quintile	0.248***	0.131***	0.059***	0.086***	0.098***
	(0.010)	(0.008)	(0.006)	(0.009)	(0.015)
Asian background	0.193***	0.148***	0.173***	0.200***	0.165***
	(0.015)	(0.011)	(0.010)	(0.012)	(0.015)
Black background	0.055***	0.073***	0.088***	0.111***	0.101***
	(0.013)	(0.010)	(0.010)	(0.014)	(0.019)
Chinese background	0.360***	0.187***	0.181***	0.200***	0.130***
	(0.024)	(0.019)	(0.018)	(0.020)	(0.024)
Mixed ethnicity	0.073***	0.044***	0.047***	0.050***	0.042***
	(0.009)	(0.007)	(0.007)	(0.009)	(0.012)
Other ethnicity	0.038**	0.028**	0.029**	0.039**	0.031
	(0.018)	(0.013)	(0.013)	(0.017)	(0.021)
Has English as an additional language	–0.036***	–0.016**	–0.001	–0.005	–0.011
	(0.011)	(0.008)	(0.008)	(0.010)	(0.013)
EAL missing	0.027	0.005	0.015	0.008	–0.017
	(0.032)	(0.027)	(0.027)	(0.035)	(0.044)
SEN statement (Year 7)	–0.150***	–0.036***	–0.029**	–0.041*	–0.023
	(0.014)	(0.011)	(0.011)	(0.021)	(0.045)
SEN School Action/Plus (Year 7)	–0.183***	–0.032***	–0.026***	–0.059***	–0.063***
	(0.005)	(0.004)	(0.004)	(0.008)	(0.015)
Distance to nearest grammar school (km)	–0.010***	–0.009***	–0.010***	–0.015***	–0.019***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Winter born	–0.017***	0.012***	0.012***	0.015***	0.014**
	(0.004)	(0.003)	(0.003)	(0.005)	(0.006)
Spring born	–0.016***	0.030***	0.030***	0.038***	0.037***
	(0.004)	(0.004)	(0.003)	(0.005)	(0.007)
Summer born	–0.029***	0.039***	0.038***	0.049***	0.046***
	(0.004)	(0.003)	(0.003)	(0.005)	(0.007)
KS2 scores					
Standardised KS2 English score		–0.010	–0.005	0.137***	0.559***
		(0.023)	(0.023)	(0.026)	(0.065)
Standardised KS2 English score, squared		–0.019	–0.010	0.044***	–0.157***
		(0.033)	(0.033)	(0.015)	(0.028)
Standardised KS2 English score x English score above average		0.141***	0.132***	0.148***	
		(0.031)	(0.031)	(0.041)	
Standardised KS2 English score, squared		0.041	0.034	–0.085***	

	Model 1 Pupil chars only	**Model 2** With KS2 scores	**Model 3** With prim school chars	**Model 4** With prim school chars	**Model 5** With prim school chars
Sample:	**Level 4 plus in Eng & maths**	**Level 4 plus in Eng & maths**	**Level 4 plus in Eng & maths**	**Level 5 in Eng or maths**	**Level 5 in Eng & maths**
x English score above average		(0.031)	(0.032)	(0.016)	
Standardised KS2 maths score		–0.016	–0.019	0.092***	0.608***
		(0.019)	(0.019)	(0.030)	(0.056)
Standardised KS2 maths score, squared		–0.042*	–0.047*	0.035	–0.105***
		(0.025)	(0.026)	(0.022)	(0.025)
Standardised KS2 maths score		0.257***	0.255***	0.336***	
x Maths score above average		(0.030)	(0.030)	(0.046)	
Standardised KS2 maths score, squared		0.116***	0.124***	–0.056**	
x Maths score above average		(0.024)	(0.024)	(0.022)	
Achieved KS2 level 5 in Eng and maths		0.082***	0.080***	0.016**	
		(0.006)	(0.006)	(0.007)	
Primary school characteristics					
Voluntary aided (Year 6)			0.026***	0.036***	0.037***
			(0.009)	(0.012)	(0.013)
Voluntary controlled (Year 6)			0.047***	0.066***	0.070***
			(0.009)	(0.012)	(0.014)
Foundation (Year 6)			0.008	0.002	–0.011
			(0.015)	(0.021)	(0.025)
Other state school (Year 6)			0.025	–0.063	–0.040
			(0.120)	(0.179)	(0.251)
Proportion of pupils at prim school who are eligible for FSM			–0.133***	–0.202***	–0.218***
			(0.031)	(0.046)	(0.059)
Proportion of pupils at prim school who are white			–0.023	–0.053	–0.017
			(0.036)	(0.051)	(0.064)
Proportion of pupils at prim school with EAL			–0.115***	–0.153***	–0.093
			(0.038)	(0.053)	(0.067)
Proportion of pupils at prim school with SEN School Action/Plus			–0.065***	–0.092***	–0.114***
			(0.024)	(0.035)	(0.043)
Proportion of pupils at prim school with SEN statement			–0.159**	–0.186*	–0.172
			(0.068)	(0.104)	(0.133)
Proportion of pupils at prim school who are IDACI quintile 1			–0.102***	–0.163***	–0.216***
			(0.024)	(0.034)	(0.043)
Proportion of pupils at prim school who are IDACI quintile 2			–0.095***	–0.131***	–0.147***
			(0.022)	(0.031)	(0.037)
Proportion of pupils at prim school who are IDACI quintile 3			–0.049**	–0.062**	–0.052*
			(0.020)	(0.026)	(0.028)
Proportion of pupils at prim school who are IDACI quintile 4			–0.038**	–0.051**	–0.047*
			(0.018)	(0.023)	(0.026)
Proportion of pupils at prim school with KS2 level 5 in English and maths			–0.077***	–0.113***	–0.115***
			(0.029)	(0.037)	(0.042)
No. of observations	83,571	83,571	83,382	52,212	27,704

Note: Models are all estimated by ordinary least squares, with standard errors clustered at the primary-school level shown in parentheses. A constant, year and primary school fixed effects are included in the regressions but not reported. *** denotes that the effect is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using National Pupil Database, 2009–10 and 2011–12.

Table A.8. Determinants of attendance at grammar schools: local authorities with isolated grammar schools

Sample:	**Model 1** Pupil chars only **Level 4 plus in Eng & maths**	**Model 2** With KS2 scores **Level 4 plus in Eng & maths**	**Model 3** With prim school chars **Level 4 plus in Eng & maths**	**Model 4** With prim school chars **Level 5 in Eng or maths**	**Model 5** With prim school chars **Level 5 in Eng & maths**
Pupil characteristics					
Eligible for FSM in Year 7	–0.030***	–0.012***	–0.008***	–0.018***	–0.044***
	(0.002)	(0.001)	(0.001)	(0.003)	(0.006)
2nd-poorest IDACI quintile	0.026***	0.021***	0.005**	0.009**	0.015**
	(0.003)	(0.003)	(0.002)	(0.004)	(0.007)
Middle IDACI quintile	0.044***	0.032***	0.009***	0.016***	0.026***
	(0.004)	(0.003)	(0.002)	(0.004)	(0.008)
2nd-richest IDACI quintile	0.056***	0.036***	0.008***	0.014***	0.024***
	(0.004)	(0.004)	(0.002)	(0.004)	(0.008)
Richest IDACI quintile	0.076***	0.048***	0.014***	0.022***	0.033***
	(0.004)	(0.004)	(0.003)	(0.005)	(0.009)
Asian background	0.107***	0.095***	0.111***	0.175***	0.238***
	(0.007)	(0.007)	(0.006)	(0.009)	(0.014)
Black background	0.018***	0.025***	0.029***	0.046***	0.069***
	(0.005)	(0.004)	(0.005)	(0.008)	(0.016)
Chinese background	0.241***	0.175***	0.169***	0.209***	0.290***
	(0.024)	(0.021)	(0.021)	(0.025)	(0.035)
Mixed ethnicity	0.029***	0.023***	0.025***	0.040***	0.062***
	(0.004)	(0.004)	(0.004)	(0.006)	(0.011)
Other ethnicity	0.056***	0.051***	0.053***	0.085***	0.133***
	(0.007)	(0.006)	(0.006)	(0.010)	(0.017)
Has English as an additional language	–0.049***	–0.043***	–0.033***	–0.051***	–0.063***
	(0.005)	(0.005)	(0.004)	(0.007)	(0.012)
EAL missing	–0.002	–0.000	0.007	0.011	0.016
	(0.016)	(0.014)	(0.014)	(0.026)	(0.044)
SEN statement (Year 7)	–0.027***	–0.006	–0.005	–0.008	–0.033
	(0.005)	(0.005)	(0.005)	(0.011)	(0.031)
SEN School Action/Plus (Year 7)	–0.028***	0.004***	0.006***	0.013***	0.027**
	(0.002)	(0.002)	(0.002)	(0.004)	(0.011)
Distance to nearest grammar school (km)	–0.003***	–0.002***	–0.002***	–0.004***	–0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Winter born	–0.006***	0.002	0.002	0.003	0.008*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)
Spring born	–0.007***	0.007***	0.007***	0.010***	0.013***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
Summer born	–0.010***	0.009***	0.009***	0.015***	0.019***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
KS2 scores					
Standardised KS2 English score		0.052***	0.052***	0.014	0.007
		(0.008)	(0.008)	(0.009)	(0.055)
Standardised KS2 English score, squared		0.067***	0.067***	0.006	0.071***
		(0.011)	(0.011)	(0.004)	(0.025)
Standardised KS2 English score x English score above average		–0.133***	–0.134***	–0.081***	
		(0.013)	(0.013)	(0.016)	

Sample:	**Model 1** Pupil chars only **Level 4 plus in Eng & maths**	**Model 2** With KS2 scores **Level 4 plus in Eng & maths**	**Model 3** With prim school chars **Level 4 plus in Eng & maths**	**Model 4** With prim school chars **Level 5 in Eng or maths**	**Model 5** With prim school chars **Level 5 in Eng & maths**
Standardised KS2 English score, squared x English score above average		0.035***	0.035***	0.090***	
		(0.009)	(0.009)	(0.007)	
Standardised KS2 maths score		0.114***	0.114***	0.100***	–0.363***
		(0.007)	(0.007)	(0.011)	(0.038)
Standardised KS2 maths score, squared		0.132***	0.131***	0.064***	0.298***
		(0.010)	(0.010)	(0.008)	(0.019)
Standardised KS2 maths score x Maths score above average		–0.284***	–0.284***	–0.261***	
		(0.014)	(0.014)	(0.020)	
Standardised KS2 maths score, squared x Maths score above average		0.071***	0.072***	0.132***	
		(0.008)	(0.008)	(0.009)	
Achieved KS2 level 5 in Eng and maths		0.018***	0.017***	0.015***	
		(0.003)	(0.003)	(0.003)	
Primary school characteristics					
Voluntary aided (Year 6)			0.009**	0.015***	0.022**
			(0.004)	(0.006)	(0.009)
Voluntary controlled (Year 6)			0.019***	0.028***	0.044***
			(0.005)	(0.008)	(0.012)
Foundation (Year 6)			0.012	0.016	0.025
			(0.008)	(0.012)	(0.018)
Other state school (Year 6)			–0.007	–0.059***	0.015
			(0.036)	(0.011)	(0.019)
Proportion of pupils at prim school who are eligible for FSM			–0.019*	–0.031*	–0.073**
			(0.011)	(0.019)	(0.034)
Proportion of pupils at prim school who are white			–0.052***	–0.094***	–0.153***
			(0.020)	(0.032)	(0.051)
Proportion of pupils at prim school with EAL			–0.089***	–0.139***	–0.204***
			(0.019)	(0.032)	(0.051)
Proportion of pupils at prim school with SEN School Action/Plus			–0.004	–0.010	–0.047*
			(0.010)	(0.017)	(0.028)
Proportion of pupils at prim school with SEN statement			–0.001	–0.007	–0.000
			(0.029)	(0.046)	(0.078)
Proportion of pupils at prim school who are IDACI quintile 1			–0.064***	–0.109***	–0.178***
			(0.010)	(0.016)	(0.028)
Proportion of pupils at prim school who are IDACI quintile 2			–0.029***	–0.046***	–0.084***
			(0.008)	(0.012)	(0.021)
Proportion of pupils at prim school who are IDACI quintile 3			–0.027***	–0.038***	–0.054***
			(0.008)	(0.012)	(0.020)
Proportion of pupils at prim school who are IDACI quintile 4			–0.017*	–0.021	–0.036*
			(0.009)	(0.013)	(0.019)
Proportion of pupils at prim school with KS2 level 5 in English and maths			–0.020*	–0.034*	–0.066**
			(0.012)	(0.017)	(0.027)
No. of observations	127,097	127,097	127,069	73,695	34,483

Note: Models are all estimated by ordinary least squares, with standard errors clustered at the primary-school level shown in parentheses. A constant, year and primary school fixed effects are included in the regressions but not reported. *** denotes that the effect is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

Source: Authors' calculations using National Pupil Database, 2009–10 and 2011–12.

Table A.9. Determinants of attendance at grammar schools: London

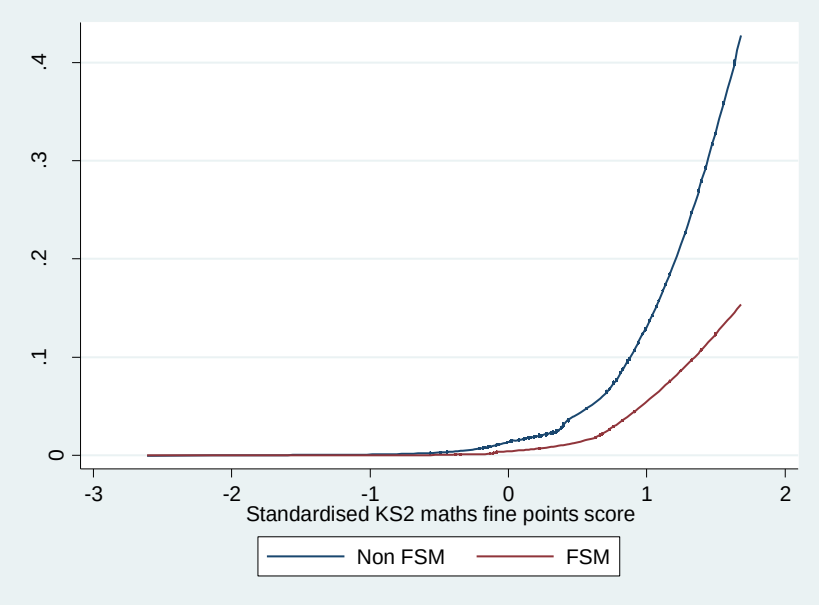
Sample:	**Model 1** Pupil chars only **Level 4 plus in Eng & maths**	**Model 2** With KS2 scores **Level 4 plus in Eng & maths**	**Model 3** With prim school chars **Level 4 plus in Eng & maths**	**Model 4** With prim school chars **Level 5 in Eng or maths**	**Model 5** With prim school chars **Level 5 in Eng & maths**
Pupil characteristics					
Eligible for FSM in Year 7	–0.021***	–0.006***	–0.004***	–0.012***	–0.027***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)
2nd-poorest IDACI quintile	0.007***	0.002	–0.000	0.001	0.006
	(0.002)	(0.001)	(0.001)	(0.002)	(0.005)
Middle IDACI quintile	0.023***	0.013***	0.002	0.005	0.008
	(0.003)	(0.003)	(0.002)	(0.004)	(0.007)
2nd-richest IDACI quintile	0.041***	0.025***	0.008**	0.011**	0.017**
	(0.004)	(0.003)	(0.003)	(0.005)	(0.008)
Richest IDACI quintile	0.068***	0.044***	0.017***	0.020***	0.018*
	(0.006)	(0.005)	(0.004)	(0.006)	(0.009)
Asian background	0.082***	0.071***	0.074***	0.115***	0.172***
	(0.005)	(0.004)	(0.004)	(0.006)	(0.009)
Black background	0.020***	0.029***	0.033***	0.050***	0.070***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.006)
Chinese background	0.226***	0.155***	0.154***	0.186***	0.249***
	(0.017)	(0.014)	(0.014)	(0.016)	(0.022)
Mixed ethnicity	0.023***	0.020***	0.022***	0.033***	0.056***
	(0.003)	(0.002)	(0.002)	(0.004)	(0.007)
Other ethnicity	0.025***	0.023***	0.024***	0.038***	0.051***
	(0.003)	(0.003)	(0.003)	(0.006)	(0.011)
Has English as an additional language	–0.013***	–0.009***	–0.006***	–0.010***	–0.011**
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
EAL missing	0.046***	0.045***	0.049***	0.075***	0.107***
	(0.014)	(0.012)	(0.012)	(0.019)	(0.029)
SEN statement (Year 7)	–0.026***	–0.004	–0.002	–0.003	–0.031
	(0.005)	(0.005)	(0.005)	(0.011)	(0.028)
SEN School Action/Plus (Year 7)	–0.029***	–0.004***	–0.002	–0.009***	–0.025***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.006)
Distance to nearest grammar school (km)	–0.006***	–0.005***	–0.005***	–0.008***	–0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Winter born	–0.004**	0.002	0.002	0.003	0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)
Spring born	–0.003*	0.007***	0.007***	0.013***	0.021***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
Summer born	–0.006***	0.009***	0.009***	0.014***	0.021***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
KS2 scores					
Standardised KS2 English score		0.036***	0.035***	0.017*	–0.102**
		(0.008)	(0.008)	(0.009)	(0.051)
Standardised KS2 English score, squared		0.047***	0.046***	0.009**	0.097***
		(0.011)	(0.011)	(0.004)	(0.024)
Standardised KS2 English score x English score above average		–0.105***	–0.104***	–0.104***	
		(0.013)	(0.013)	(0.016)	

Sample:	**Model 1** Pupil chars only **Level 4 plus in Eng & maths**	**Model 2** With KS2 scores **Level 4 plus in Eng & maths**	**Model 3** With prim school chars **Level 4 plus in Eng & maths**	**Model 4** With prim school chars **Level 5 in Eng or maths**	**Model 5** With prim school chars **Level 5 in Eng & maths**
Standardised KS2 English score, squared x English score above average		0.032***	0.034***	0.079***	
		(0.009)	(0.009)	(0.007)	
Standardised KS2 maths score		0.128***	0.127***	0.135***	–0.533***
		(0.008)	(0.008)	(0.013)	(0.040)
Standardised KS2 maths score, squared		0.148***	0.145***	0.081***	0.378***
		(0.010)	(0.010)	(0.012)	(0.020)
Standardised KS2 maths score x Maths score above average		–0.315***	–0.314***	–0.357***	
		(0.015)	(0.015)	(0.023)	
Standardised KS2 maths score, squared x Maths score above average		0.056***	0.058***	0.139***	
		(0.007)	(0.007)	(0.012)	
Achieved KS2 level 5 in Eng and maths		0.014***	0.014***	0.020***	
		(0.002)	(0.002)	(0.003)	
Primary school characteristics					
Voluntary aided (Year 6)			0.002	0.004	0.010
			(0.003)	(0.005)	(0.008)
Voluntary controlled (Year 6)			0.020	0.041*	0.046*
			(0.014)	(0.024)	(0.027)
Foundation (Year 6)			0.003	0.006	0.010
			(0.006)	(0.010)	(0.017)
Other state school (Year 6)			–0.019	–0.033	–0.036
			(0.019)	(0.023)	(0.035)
Proportion of pupils at prim school who are eligible for FSM			–0.033***	–0.056***	–0.110***
			(0.009)	(0.014)	(0.026)
Proportion of pupils at prim school who are white			–0.002	0.001	0.004
			(0.008)	(0.013)	(0.022)
Proportion of pupils at prim school with EAL			–0.008	–0.013	–0.018
			(0.007)	(0.011)	(0.020)
Proportion of pupils at prim school with SEN School Action/Plus			–0.018**	–0.030**	–0.051**
			(0.008)	(0.013)	(0.023)
Proportion of pupils at prim school with SEN statement			–0.088***	–0.138***	–0.252***
			(0.029)	(0.047)	(0.077)
Proportion of pupils at prim school who are IDACI quintile 1			–0.085***	–0.112***	–0.159***
			(0.016)	(0.022)	(0.032)
Proportion of pupils at prim school who are IDACI quintile 2			–0.093***	–0.117***	–0.158***
			(0.016)	(0.022)	(0.031)
Proportion of pupils at prim school who are IDACI quintile 3			–0.065***	–0.081***	–0.116***
			(0.018)	(0.025)	(0.035)
Proportion of pupils at prim school who are IDACI quintile 4			–0.066***	–0.080***	–0.108**
			(0.023)	(0.031)	(0.043)
Proportion of pupils at prim school with KS2 level 5 in English and maths			–0.036***	–0.047***	–0.052**
			(0.011)	(0.016)	(0.024)
No. of observations	107,560	107,560	107,490	62,585	29,246

Note: Models are all estimated by ordinary least squares, with standard errors clustered at the primary-school level shown in parentheses. A constant, year and primary school fixed effects are included in the regressions but not reported. *** denotes that the effect is statistically significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level.

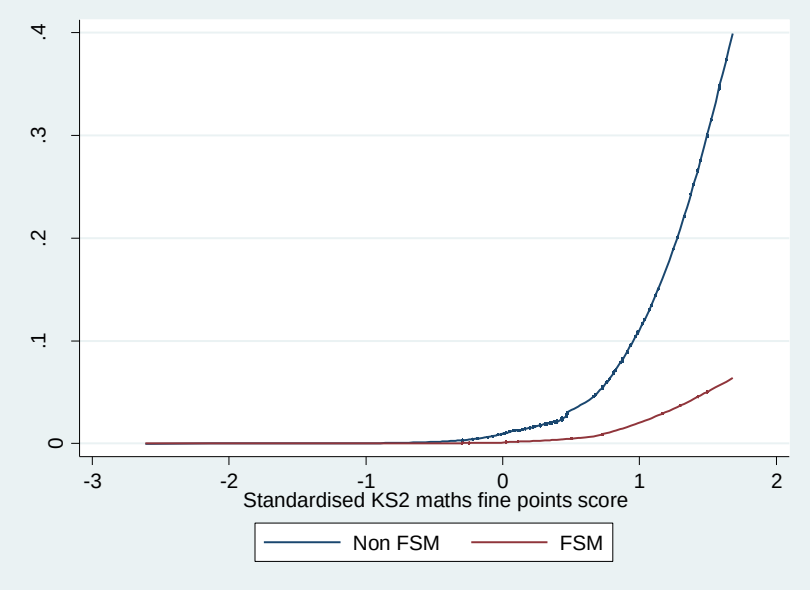
Source: Authors' calculations using National Pupil Database, 2009–10 and 2011–12.

Figure A.1. Probability of attending a grammar school for FSM and non-FSM pupils in local authorities with isolated grammar schools, given KS2 maths points score, 2009–10 and 2011–12



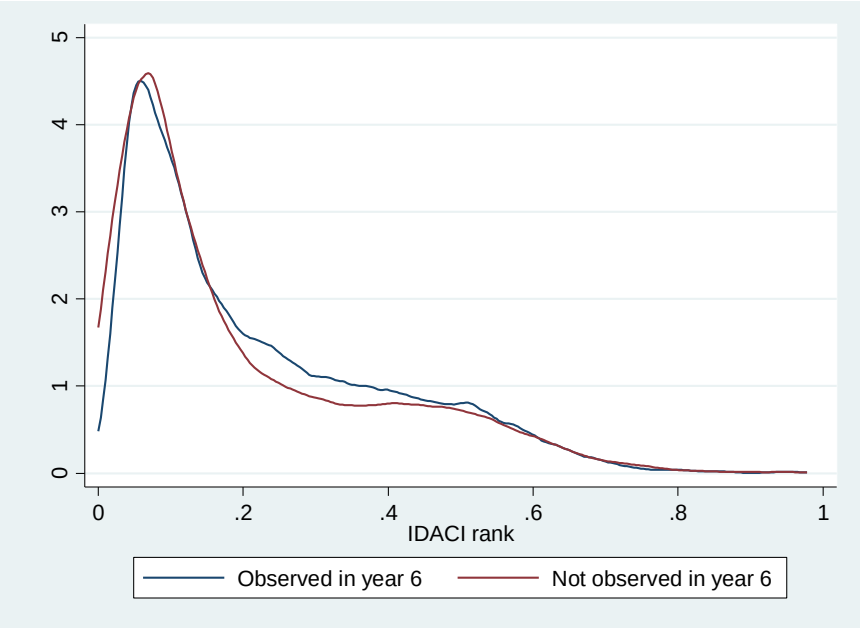
Source: Authors' calculations using the National Pupil Database, 2009–10 and 2011–12.

Figure A.2. Probability of attending a grammar school for FSM and non-FSM pupils in London, given KS2 maths points score, 2009–10 and 2011–12



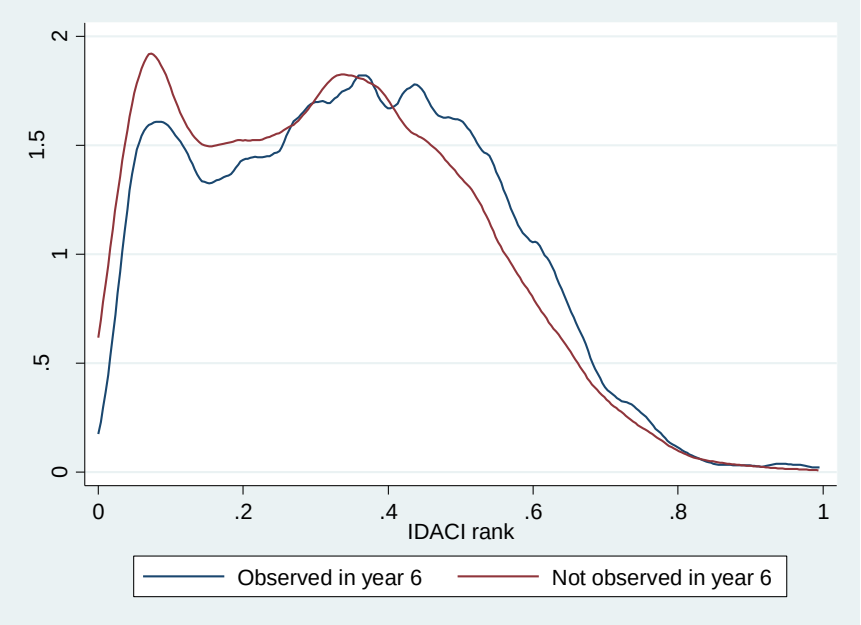
Source: Authors' calculations using the National Pupil Database, 2009–10 and 2011–12.

Figure A.3. IDACI rank of grammar school pupils in local authorities with isolated grammar schools, for pupils observed in the National Pupil Database in Year 6 and those who are not



Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

Figure A.4. IDACI rank of grammar school pupils in London, for pupils observed in the National Pupil Database in Year 6 and those who are not



Source: Authors' calculations using the National Pupil Database, 2009–10 to 2011–12.

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