Parental choice of primary school in England: what types of school do different types of family really have available to them?

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Abstract

We investigate what types of school are genuinely accessible to different pupils in England, given the reliance on geographical proximity as the key oversubscription criterion for allocating school places. Using an innovative combination of survey and administrative data we determine what types of school are located near to different family types. We then investigate how many of these different types of school are really available to the student, based on current catchment areas of schools and the home location of the child. This enables us to assess how access is determined by geography, and how it differs both by school type and by type of family. We find large differences in the range of schools genuinely available to different families and argue that this, coupled with the use of proximity as a tie-break device, continues to be a significant barrier to reducing inequality of access in the English school system.

Keywords: school preferences, school choice, parental choice

JEL classification codes: I20

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1. Introduction

Since the 1988 Education Reform Act parents in England have had the right to express a preference for the school their child attends. The 2006 Education and Inspections Act strengthened the role of parental choice, banning covert selection of pupils by schools, establishing ‘choice advisors’ for parents, and providing free transport to school for the most disadvantaged. The recently elected coalition administration is maintaining the focus on choice through its expansion of the Academies programme and the introduction of so-called ‘free schools’. Underlying this continued emphasis on parental choice is the theory that allowing parents to choose the school attended by their child (instead of enrolling them in their local school by default) will increase educational standards: schools will improve their performance when forced to compete to attract pupils. While the theoretical benefits of school choice as a policy may be clear, the existing evidence on its impact is mixed (Bradley, Johnes and Millington, 2001; Hoxby, 2000, 2003; Hastings et al. 2005; Gibbons, Machin and Silva, 2008). Our reading of the literature is that competition, as it currently exists in England at least, has not significantly improved the academic performance of schools.

There are various reasons why this may be the case. Academic standards may not necessarily be of prime concern to parents. Many other factors may be important to parents when they express their preference for a school, in which case the incentive for schools to raise standards is lessened (Ball, 2003; Denessen et al. 2005). Alternatively, there are clear limitations to the school market in England which may prevent the theoretical ideal being realised. First, failing schools often do not get shut down, which undermines the competitive pressure of the market. Rather they are targeted with a swathe of policies aimed at improving their test results, often with additional financial investment. Second, successful, oversubscribed schools cannot expand to meet demand indefinitely. This means that although parents have the right to express a preference for schools, their choice is not guaranteed. Third, constraints faced by parents in their choice of school may hinder the market mechanism. School

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1 We address this issue directly in Burgess et al (2009).
choice may be a myth if parents can only access schools that they live very close to. In this instance we would not expect the introduction of school choice to necessarily raise standards nor to reduce pre-existing social segregation in schools based on residential sorting. Admission to an oversubscribed school in England is determined by the school’s admissions code which, for the majority of schools, operates on distance- and siblings-based criteria (West and Pennell, 1999; Pennell et al 2006). Evidence suggests that the proximity criteria have increased house prices in desirable catchment areas, which effectively prohibits access for pupils from less advantaged families, who are priced out of the market (Gibbons and Machin 2003).

In this paper we focus on the constraint on parental choice caused by geographical location, which arises due to geographical proximity being the key oversubscription criterion for schools. We investigate the key assumption that most families really can choose between a range of different schools and address our overarching research question: what types of school are genuinely accessible to different types of pupil? We first establish what types of schools different families have near to them – within a 3km radius of their home – and investigate whether there is a systematic relationship between pupil characteristics and proximity to particular school types. Disadvantaged pupils may simply not have access to some types of school because they do not live near enough to such schools. Defining such a ‘feasible choice set’ based on straight line distances captures nothing about whether the family might reasonably be expected to be offered a place there, however. We therefore also calculate de facto catchment areas for each school, based on the geographical area from which the school draws its student intake. This enables us to ascertain which schools are genuinely feasible for different types of family. For example, disadvantaged children may not be able to access some types of school, despite living nearby, because they live outside the school’s de facto catchment area. We compare the characteristics of schools that are available to families on the basis of both proximity (straight line distance) and de facto catchment areas.

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3 Oversubscription criteria determine whether a family is successful in their first choice. Most schools’ admissions are controlled and co-ordinated by their local authority (LA). Voluntary aided and Foundation schools are able to set their own admissions criteria.
We use an innovative combination of survey and administrative data that comprises the Millennium Cohort Study (MCS) and the administrative data held on each state school pupil by the Department for Education. This combination of rich longitudinal data in the MCS with administrative data provides a powerful research resource which enables us to add to the international academic literature on school choice and to the policy debate in Britain.

This paper contributes to a growing literature on parental choice which has considered the factors that influence parents’ choices from both an economic standpoint (Fuller and Elmore, 1996; Kleitz et al. 2000; Jacob and Lefgren, 2007) and from a sociological perspective (Ball, 1993; Gewirtz et al. 1995; Reay and Lucey, 2003). There is also a closely related literature on the relationship between geography and access to public services, such as health and education (see Taylor, 2001; the special edition of Urban Studies on the topic edited by Butler and Hamnett, 2007; Gulson and Symes, 2007). This literature has recognised that geographical location influences potential school choice (see Echols et al. 1990 for an analysis of choice in Scotland and Taylor, 2001 for England) and hence the impact of choice on competition between schools. Further, geographical limits to school choice are greater for disadvantaged pupils, such as those from poor backgrounds or, in the US context, certain ethnic minority groups (Butler and Robson, 2003; Croft, 2004; Andre-Bechely, 2007). School choice in England is certainly partially determined by the ability of parents to buy more expensive houses near to desirable schools. Indeed, economists have determined that there are substantial house price premia associated with access to particularly desirable schools (Gibbons and Machin, 2003). We add to this literature by providing detailed empirical evidence on the extent to which pupils in different locations are genuinely able to access different types of primary school, some 20 years after the introduction of parental choice to England.

2. Data

Our primary data source is the Millennium Cohort Study (MCS). The MCS was sampled from all live births in the UK, which for England and Wales took place over a 12 month period from 1 September 2000 and 31 August 2001. This period coincides
with the school academic year, meaning that children in the study in England and Wales form an academic cohort (MSC Guide to the Datasets 2008).

For England, the sample was selected from a random sample of electoral wards, disproportionately stratified to ensure adequate representation of deprived areas, defined as the poorest 25% of wards based on the Child Poverty Index (CPI)\(^4\), and also areas with high concentrations of Black and Asian families\(^5\). Weights provided with the data are applied to the analyses reported here to correct for this and so to enable us to draw nationally representative inferences. The sample draws from all children that are living in the UK at age nine months and eligible to receive Child Benefit at that age\(^6\). Our study uses data from England only, since school policy and admission arrangements differ between countries in the UK. Due to ineligibility of some families and refusal to participate by others, the final sample achieved was 11,533.

Our paper uses the third survey of the MCS, carried out in 2006 when children in the study are five years old. The timing of the third survey was deliberate: the children were beginning primary school and a main objective of the MCS was “to record the child’s transition to primary school, from the point of view of their parents and their school” (MCS Guide to the Datasets 2008; page 13). The MCS survey contains information on a range of family characteristics, plus a detailed set of questions on parental choice of primary school, including their actual choice of school from the nominations they made on their local authority (LA) application form when applying for a school and information on whether they got the school that they named as ‘first preference’ on that form.

The data include information that enables us to construct two indicators for whether any particular school represents a feasible choice for parents. The first indicator is the geographical (straight line) distance between the home and the school. The second

\(^4\) The CPI is defined as the percentage of children under 16 in an electoral ward living in families that were, in 1998, receiving at least one of the following benefits: Income Support; Jobseekers Allowance; Family Credit; Disability Working Allowance, and is therefore a proxy for neighbourhood deprivation.

\(^5\) ‘High’ is defined as above 30% of the ward. Proportions are based on the 1991 national census.

\(^6\) The Department for Work and Pensions (DWP) estimates that 97.2% of children received Child Benefit by 7 months of age in 2000.
indicator is whether the pupil is in the school’s de facto catchment area, which is
determined on the basis of the home postcodes of the school’s pupil intake in the year
prior to our sample making their choice of school. We are able to construct these
measures using the MCS data, which provides information on pupils’ postcodes, in
combination with administrative data on schools. Further information on how the de
facto catchment areas are constructed is given in section 3 below.

Having constructed two distinct indicators of whether a school is accessible to a
particular child, we then compare the characteristics of schools available to different
types of families. The data on school characteristics for all primary schools in
England comes from two data sources; EduBase and the National Pupil Database
(NPD).

EduBase is a register of all educational establishments in England and Wales which
contains administrative information for each school, whether it is in the state or
independent sector. This includes the type of school (whether voluntary aided,
voluntary controlled etc.), phase of education (primary, middle or secondary) and its
exact location (postcode).

The NPD is an administrative dataset that covers all pupils in state schools in
England. This dataset contains information on pupils’ attainment at each Key Stage
level of the National Curriculum, and also information from the pupil level census
such as each pupil’s eligibility for free school meals, recognition of any special
educational need and whether they have English as an additional language. Providing
this information is a statutory requirement for all maintained schools in England; data
should therefore be accurate and reliable. We aggregate the pupil level data to school
level, which gives us school level variables such as the percentage of pupils in the
school that are eligible for free school meals (FSM), a proxy for low income; the
percentage that have any special educational need (SEN); and the percentage that
have English as an additional language (EAL). From the attainment data we also
construct a measure of each school’s average Key Stage 2 (KS2, taken at age 11) test
score, and the percentage of pupils that achieve level 5 in all subjects at KS2\textsuperscript{7}. These indicators are calculated for the cohort of pupils taking the tests in 2003, which were published in school performance tables in 2004 and so were available to MCS respondents when making their school choices\textsuperscript{8}. We do not have information on average attainment or composition for schools in the independent sector as information for these schools is not collected by the government.

To make the quantitative analysis tractable we need to group schools according to their characteristics. In practice, parents choose from a limited range of ‘local’ schools. We therefore define our school types relative to other schools that are accessible to each family. We define a ‘high-scoring’ school as a school with an average KS2 exam performance that exceeds the median level achieved by the schools in the child’s feasible choice set of schools (as defined in section 3). The KS2 performance is averaged over a three year period. A ‘low scoring’ school is therefore a school with an average KS2 score below the median. When schools are equal to the median value we randomly assign them either above or below. We define a ‘relatively poor’ school as a school where the proportion of pupils eligible for free school meals (FSM) is above the median level within the feasible choice set and a ‘relatively rich’ school as a school where the proportion is below the median. Again, in cases where the school equals the median it is randomly assigned. We also distinguish between faith and non-faith schools. We group schools based on these three factors (KS2 performance, FSM rate and faith status) to generate the groups given in Table 2, for example ‘rich, low scoring non-faith’ schools, ‘rich, high scoring non-faith’ schools, and ‘rich, high scoring faith’ schools etc.

3. Methodology

In order to determine what schools a pupil can access, we need to construct a ‘feasible choice set’ of schools for each child. One option is to simply consider that all schools within a certain distance are feasible. This distance may vary between rural and urban

\textsuperscript{7} Level 5 is above the expected level of attainment at KS2 set by government. This indicator therefore represents the proportion of pupils that achieve highly at the end of primary school.

\textsuperscript{8} School performance tables are available online each year from the Department of Children Schools and Families (DCSF), for example see: http://www.dcsf.gov.uk/performancetables/primary_08.shtml, where a variety of statistics on school performance are published.
areas due to different norms and transport links, but the same concept would hold in all areas: namely that within a certain travel distance all schools are considered feasible by parents. There is a potential flaw with this however. Some schools are popular and take their pupil intake from a relatively small area. Other schools are less popular and admit pupils from further away. Popular schools with small catchment areas may not be a realistic choice, and so should not be included in the parent’s feasible choice set. Certainly parents are likely to have some knowledge of how popular each school is and some LAs provide information on oversubscribed schools, for example how far away the furthest pupil lived from the school in the previous year. We therefore compare results using two different approaches to defining a feasible choice set; one based on distance alone, and one based on consideration of each school’s de facto ‘catchment area’.

Our first definition of a feasible choice set (FCS) is defined simply in terms of distance to travel, which we term FCS-T. We calculate the straight line distance between each pupil in our sample and every school in England. We assign all schools that are within 3km of the pupil’s home and in the same LA to their feasible choice set. The FCS-T simply defines what is available within a reasonable travel distance of the family’s home; it does not tell us whether the child might reasonably be expected to be offered a place there.

We also construct an alternative feasible choice set as one which includes all schools in the same LA and within 20km of the family’s home address, and, most importantly, in which the family lives in the de facto ‘catchment area’. The catchment area is defined as the radius from which 80% of the school’s intake has been drawn in the previous year. We calculate this pseudo catchment area based on the previous year’s entry as this is the year that is most relevant to prospective MCS parents. We term this feasible choice set as FCS-C.

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9 These restrictions are simply to ensure that schools with very large catchment areas, such as boarding schools, are excluded from the feasible choice set.
4. Results

**Characteristics of nearby schools for different types of family**

We start our analysis by simply considering the characteristics of schools that are located near to different types of families. Table 1 provides the mean characteristics of schools that are within 3km of the child’s house (i.e. within their FCS-T). The table shows how the characteristics of schools within this choice set vary significantly by parental characteristics. For the sample as a whole, the mean FSM rate of schools within 3km is 16.4%. Yet this varies hugely by parental type. For low SES parents, the mean FSM rate of schools within 3km is 21%, whilst for high SES families the mean FSM rate is just 12%. Equally families in metropolitan areas tend to be located close to schools with a much higher FSM rate than pupils living in towns and village areas. Similar but less stark patterns can be observed when we consider the percentage of pupils in a school who have English as an Additional Language and the proportion of pupils who are White British. Interestingly however, the mean Special Educational Needs rate of schools within 3km does not vary hugely across different types of families and nor does the mean Key Stage 2 (KS2) test scores of schools. This implies that even though different types of pupils live near to schools with quite different average pupil characteristics, the average KS2 achievement level of schools in most children’s FCS-T is relatively similar.

Importantly given the focus of this paper, we find that whilst the average number of schools within 3km of a child is high, at around 12 schools, there is substantial variation which is partially, though not completely, driven by urban and rural differences. Disadvantaged families have a greater number of schools accessible within 3km (nearly 15 schools) than do wealthier families (10 schools on average). This is related to the fact that more disadvantaged pupils are more likely to live in urban areas. Pupils living in metropolitan areas have around 19 schools within 3km of their house whilst those in towns and village areas have only 3 schools within 3km. Not surprisingly this suggests that parents in urban areas are more likely to have a range of schools to choose from, and hence this is where we might expect competition to be most active.

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10 Details of how we derive our measure of socio-economic status are given in the Appendix.
Not all of the difference between low and high SES pupils in terms of the number of schools they have within 3km of their home is attributable to the fact that the former are more likely to be located in big cities. Taking only metropolitan areas, low SES families have around 23 schools within 3km, whilst high SES families have 16. This no doubt reflects the density of population in areas where poorer families are located. Again on the face of it, these results imply that disadvantaged pupils in urban areas have the greatest opportunity for school choice; we return to this point below.

*Distance to different school types by parental characteristics*

Of course simply counting the number of schools available within 3km does not confirm that these are genuine choices available to families. A key factor determining access is distance from the school, given the proximity criteria used for most school admissions. To shed some light on what is happening within the 3km radius of a child’s home, we measure how far away different types of school are for different types of family. We make use of the typology of schools, defined in section 2, based on observable characteristics of schools relative to those of other schools in the choice set. We cannot provide the actual distance to any specific school type as this would be potentially disclosive for some students. Instead, we rank schools according to their distance from the pupil and then provide information on how many schools away the nearest school of a particular type is. We can therefore see whether the ‘best’ school types (e.g. high scoring schools) are located closer to more advantaged families.

Table 2 therefore shows the average distance rank of the closest school in each category. Across the sample as a whole, the nearest school type is group 3 (poor low scoring non faith schools), whilst the furthest school type is the more unusual group 8 school (poor high scoring faith school). This illustrates that the rank of distance to different school types partially reflects how common such types are. However, what we are most interested in is how the distance rank for different school types varies across different types of family. For high SES parents, group 2 schools (rich high scoring non faith schools) are considerably nearer than for low SES parents. Such schools are only 3.2 schools away for high SES parents and are 4.8 schools away for low SES families. Within metropolitan areas, high SES families are just 3.1 schools away from rich high scoring non faith schools and 4 schools away from rich high
scoring faith schools (group 6). By contrast in metropolitan areas, low SES families are 5.5 schools away from rich high scoring non faith schools and 5.1 schools away from rich high scoring faith schools.

In summary, higher SES parents appear to be located closer to more desirable schools, i.e. higher scoring schools with wealthier intakes, and this is particularly so in metropolitan areas. Simply focusing on schools within 3km of a child’s house may in fact not tell us which schools are genuinely accessible to different families, however. Instead we need to use data on the de facto catchment areas of schools to determine which schools are really available to which children, as described in section 3.

Access to schools based on de facto catchment areas

In the first column of Table 3 we show the proportion of schools within 3km of the child’s home (i.e. in their FCS-T) that are also accessible to the child in terms of the de facto catchment area of the school (i.e. in FCS-C). This obviously tells us the extent to which our distance and our catchment area indicators overlap. If there was perfect overlap, it would be sufficient simply to count the number of schools a child has within 3km in order to determine the amount of choice the family has. The second column then shows the proportion of schools within 3km that are not accessible to the child, according to the de facto catchment area of the school (i.e. in FCS-T but not in FCS-C). This is a measure of how ineffective our 3km distance measure is in capturing the extent of school choice available to a child. The final column indicates the proportion of schools that are accessible to the child according to our de facto catchment area calculations but that are not within 3km. This last measure therefore gives an indication as to whether schools beyond 3km may still actually be accessible to some children.

Taking all parental types, just over a third of schools (36.6%) are in both the FCS-T and FCS-C. What this means is around a third of schools within 3km of the child are also genuinely accessible, according to the de facto catchment area criteria. Clearly this falls far short of all schools within a 3km radius and indicates that many schools located in close proximity to a child’s home are in fact not accessible to that child. In fact the second column suggests that on average around half of the schools that are within 3km of the child are not genuinely accessible to that child, if we consider
historic pupil intakes. The final column indicates that a small proportion of schools, 10%, are beyond the 3km radius of the child but are nonetheless accessible. Thus some schools which are quite far away are indeed accessible. This is presumably because they are undersubscribed and so do not need to apply their proximity-based admissions criterion.

These patterns of accessibility vary by family background. A smaller proportion of schools within 3km are genuinely accessible to low SES children (32%) as compared to high SES children (40%). This implies that our previous measure, which simply counted the number of schools in a 3km radius, overstated the level of choice available to low SES children. Recall that this distance measure suggested a far greater level of choice for low SES families in metropolitan areas. Yet in reality, the data suggest that many of those schools are not really accessible to low SES families due to the use of proximity criteria to determine admissions to oversubscribed schools. Indeed, for low SES families in metropolitan areas, only one quarter of the schools within a 3km radius are genuinely accessible on the basis of historic patterns of pupil intake. For families living in small towns and villages, around half the schools within the 3km radius are genuinely accessible to the child on the basis of de facto catchment areas. Thus the distance measure of choice actually works better for rural families.

*Characteristics of accessible schools for different types of family*

We now consider the characteristics of schools that are genuinely accessible to different types of children. Table 4 shows the mean characteristics of schools accessible to different types of families on the basis of the de facto catchment area criteria (i.e. in the child’s FCS-C). Just as in Table 1, we see big differences in the mean FSM rate of schools accessible to high SES families (9%) as compared to lower SES families (19%). The starkest difference is between high SES parents in metropolitan areas who are able to access schools with a mean FSM rate of 12% compared to low SES parents in these areas who have access to schools with a mean FSM rate of 26%. Similarly stark differences can be observed when we consider the proportion of children in a school who have English as an additional language or who have Special Educational Needs. Again we observe that despite these differences, different types of families access schools with relatively similar KS2 scores. Finally,
as expected, the number of schools in the choice set is markedly reduced once we use de facto catchment areas to determine whether schools are genuinely accessible to particular students.

*Who gets their first choice of school?*

We conclude from the above analysis that the average parent has five schools that are accessible according to de facto catchment area data. This suggests that parents do have some degree of school choice, although we have also shown that choice varies by family characteristics. Whilst low SES and urban families appear to have more choice in terms of the number of schools available to them within a given distance of their home, their real choices are more constrained once we take account of de facto catchment areas. Such disadvantaged families are constrained to choose from schools that are markedly less advantaged in terms of pupil characteristics.

Given that most families do appear to have some degree of choice we are also interested in the outcome of this choice process, and we use the MCS information to tell us who gets their first choice of school. In our data a very high proportion of the parents who completed the LA form report getting their first choice of school (94%). This is consistent with individual reports collected from LAs\(^\text{11}\). Furthermore, we find little variation in the proportion of parents getting their first choice school across SES, parental education level, or neighbourhood deprivation (IMD deciles)\(^\text{12}\). It may be however, that parents of disadvantaged backgrounds are adjusting their preferences on the LA form to reflect a resigned choice and we investigate this further in Burgess et al. (2009).

\(^{11}\) We contacted a small number of LAs to find out the proportion of pupils that were allocated to their first choice school. The high proportion is also consistent with data for secondary schools, which is collected by the government. In 2008 82% of families got their highest preference school, ranging from 64.5% in London to 92% in the North East. [http://www.dcsf.gov.uk/rsgateway/DB/STA/t000791/index.shtml](http://www.dcsf.gov.uk/rsgateway/DB/STA/t000791/index.shtml)

\(^{12}\) IMD is the Index of Multiple Deprivation. This index combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each small area in England. This allows each area to be ranked relative to others according to their level of deprivation ([http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/](http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/)). The Indices of Deprivation 2007 have been produced at Lower Super Output Area level (of which there are 32,482 in the country).
Figure 1 shows that there is variation in the proportion of families getting their highest nominated school between different types of geographical areas. Those with fewer schools in their local area are more likely to get a place in their first nominated school, with the exception of those with no schools within 3km. Those in more densely populated areas are less likely to get their most highly nominated school. This suggests that geographical location and population density are significant factors not only in choice, as discussed earlier, but also in whether a pupil is actually successful in getting allocated to their chosen school. This may be because there are more excess school places in areas where population density is lower or perhaps that parents are more ambitious in their choices in urban areas, willing to apply to a school knowing they have a lower chance of acceptance.

Taking this further, we find that although the proportion of parents getting their first choice of school does not vary by SES, the price of being ambitious in your school choice does. In the sample as a whole, parents that apply to the highest ranked school in terms of KS2 score in their feasible choice set have a lower probability of admission. For example, Table 5 shows that 91% of parents that choose the most highly ranked school in terms of mean KS2 score are admitted compared to 97% of parents that choose the least highly ranked school. Thus there is a potential penalty associated with choosing higher ranking schools. This risk is more evident for students in the lowest SES quintile. Only 80% of low SES parents that choose the school ranked most highly in terms of academic achievement are admitted, compared with 91% of those in the highest SES quintile. Although on average parents of different types are equally likely to gain admittance to their ‘most preferred’ school on the LA application form, this is not the case if parents of low SES apply to a school with the best academic achievement in their area.

5. Conclusion

School choice is central to the English system of school admissions, and has been a major element of government policy for more than two decades. Parental school choice has its supporters and its critics. Those who believe in market power suggest that giving parents the right to choose the school their child attends will tend to cause schools to compete with one another and raise academic standards as a consequence.
This positive view is implicitly based on the assumption that parents can actually exercise choice. This paper asks: is the case? Do most families have genuine choice, in terms of being able to access different types of school? And (how) does this vary across family type?

Our analysis of the number of schools within 3km of a child’s home suggested that there is a great deal of potential school choice, in the sense that most families live within 3km of approximately 12 primary schools. Furthermore, disadvantaged pupils in urban areas appear to have much more potential choice than do more advantaged students or those in rural areas (the latter have only three schools within 3km, on average). Our analysis of the actual distance to schools with different characteristics did suggest however, that higher SES parents were located closer to more desirable schools, i.e. higher scoring schools with wealthier intakes. Thus even if there is the potential for choice, in terms of schools nearby, geographical location still influences the kinds of schools parents can access.

When we used more realistic de facto catchment area criteria, the number of accessible schools was markedly reduced. Only around one third of schools within 3km of a child’s home are in fact accessible to the average child, on the basis of historic catchment area data. This would imply that for the average child only four schools are within 3km and accessible in terms of de facto catchment areas. Further, choice is more limited for lower SES families in the sense that a smaller proportion of schools within 3km are genuinely accessible for low SES children, particularly in urban areas. From a methodological perspective, our work clearly suggests that using straight line distance to schools as an indicator of whether a child can access that school is extremely problematic. However, even with our de facto catchment area measure, most families appeared to have a number of schools that they could potentially choose from.

Using our preferred de facto catchment area criteria, we see bigger differences in the types of schools that are genuinely available to different types of pupils. The mean FSM rate of schools accessible to high SES families (9%) was much lower in our data as compared to lower SES families (19%). This difference was particularly large in urban areas, where high SES parents access schools with a mean FSM rate of 12%.
compared to low SES parents who access schools with a mean FSM rate of 26%. This is obviously cause for concern as it confirms the degree of social segregation in our school system. More positively however, both low and high SES families appear to have access to schools with relatively similar KS2 scores. If parents of all socio-economic backgrounds can access similarly achieving schools, this is obviously important for the operation of school choice.

For low SES parents who do choose higher attaining schools, is there any truth to the idea that poorer children are de facto excluded from these schools? In general most parents get their first choice of school (94%) and this is equally true for both more and less advantaged parents. Where low SES parents make ambitious school choices they have a much lower chance of securing their first choice of school than similarly ambitious high SES parents, however. This does not necessarily reflect discrimination in the application process but rather, once again, the pernicious effect of proximity criteria.

We conclude that using proximity as the main criterion to determine access to most schools affects pupils’ probability of securing a place at a particular school, with higher SES pupils being more likely to be accepted into (nearer) more advantaged schools. This has implications for school choice policy. If, in areas where there is a lot of potential competition between schools, more advantaged families have a higher chance of achieving their more ambitious choices than do poorer parents (because they live nearer these schools), this will tend to exacerbate social segregation in our schools. In other work (Burgess et al 2009) we confirm that it is the constraints on parental choice analysed in this paper, rather than differences in parental preferences for schools, that drive differential access to schools across family types. The hugely different feasible choice sets available to families, coupled with proximity as a tie-break device, continue to be a significant barrier to reducing inequality of access in the English school system.
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Figure 1: The proportion of parents that get their first choice school (as nominated on their LA application form), by the number of schools within a 3km radius of their home.
Table 1: Characteristics of schools within 3km of the parent’s home

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<th>KS2 Score</th>
<th>“Catchment area”</th>
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<td>0.095</td>
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<td>Parents in the lowest SES quintile</td>
<td>0.213</td>
<td>0.118</td>
<td>0.215</td>
<td>0.857</td>
<td>27.223</td>
<td>1378.659</td>
<td>14.794</td>
</tr>
<tr>
<td>Parents in the highest SES quintile</td>
<td>0.122</td>
<td>0.071</td>
<td>0.186</td>
<td>0.914</td>
<td>27.975</td>
<td>1836.331</td>
<td>10.109</td>
</tr>
<tr>
<td>Parents in metropolitan areas</td>
<td>0.219</td>
<td>0.198</td>
<td>0.194</td>
<td>0.765</td>
<td>27.502</td>
<td>1383.671</td>
<td>19.303</td>
</tr>
<tr>
<td>Parents in small towns and villages</td>
<td>0.083</td>
<td>0.013</td>
<td>0.182</td>
<td>0.977</td>
<td>28.041</td>
<td>2611.771</td>
<td>2.912</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile in metropolitan areas</td>
<td>0.282</td>
<td>0.25</td>
<td>0.205</td>
<td>0.699</td>
<td>27.15</td>
<td>1209.327</td>
<td>23.022</td>
</tr>
<tr>
<td>Parents in the highest SES quintile in metropolitan areas</td>
<td>0.16</td>
<td>0.152</td>
<td>0.181</td>
<td>0.824</td>
<td>27.936</td>
<td>1520.717</td>
<td>16.401</td>
</tr>
</tbody>
</table>

Note: Sample is all those that make a choice of school on an LA application form. Non response and survey weights are applied. Other schools named by the parent (for example the first choice school) that were not inside 3km are not included in this table. The catchment area is defined as the area within which 80% of the pupils from that school are located, measured in km².
Table 2: How far away is the closest school group on average (if it is in their choice set)? Compare different parent types.

<table>
<thead>
<tr>
<th>Parent type</th>
<th>School group 1</th>
<th>School group 2</th>
<th>School group 3</th>
<th>School group 4</th>
<th>School group 5</th>
<th>School group 6</th>
<th>School group 7</th>
<th>School group 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents in the lowest SES quintile</td>
<td>7.032</td>
<td>4.758</td>
<td>2.306</td>
<td>5.695</td>
<td>8.079</td>
<td>5.236</td>
<td>6.165</td>
<td>8.663</td>
</tr>
<tr>
<td>Parents in the highest SES quintile</td>
<td>5.471</td>
<td>3.166</td>
<td>2.895</td>
<td>5.743</td>
<td>6.6</td>
<td>4.048</td>
<td>5.876</td>
<td>6.506</td>
</tr>
<tr>
<td>Parents in small towns and villages</td>
<td>2.283</td>
<td>2.286</td>
<td>2.043</td>
<td>2.956</td>
<td>2.71</td>
<td>2.4</td>
<td>2.421</td>
<td>2.426</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile in metropolitan areas</td>
<td>9.274</td>
<td>5.49</td>
<td>2.519</td>
<td>6.414</td>
<td>10.191</td>
<td>5.087</td>
<td>7.688</td>
<td>11.542</td>
</tr>
<tr>
<td>Parents in the highest SES quintile in metropolitan areas</td>
<td>7.381</td>
<td>3.147</td>
<td>3.074</td>
<td>6.566</td>
<td>8.651</td>
<td>4.023</td>
<td>8.901</td>
<td>10.007</td>
</tr>
</tbody>
</table>

Note: Sample is all those that make a choice of school on an LA application form. Non response and survey weights are applied. Other schools named by the parent (for example the first choice school) that were not inside 3km are not included in this table. School groups are as follows:

School group 1 - rich low scoring non-faith school
School group 2 - rich high scoring non-faith school
School group 3 - poor low scoring non-faith school
School group 4 - poor high scoring non-faith school
School group 5 - rich low scoring faith school
School group 6 - rich high scoring faith school
School group 7 - poor low scoring faith school
School group 8 - poor high scoring faith school
Table 3: How many schools are inside the travel distance feasible choice set (FCS-T), catchment area feasible choice set (FCS-C), or both?

<table>
<thead>
<tr>
<th>Parent type</th>
<th>In FCS-T and FCS-C</th>
<th>In FCS-T only</th>
<th>In FCS-C only</th>
</tr>
</thead>
<tbody>
<tr>
<td>All parents</td>
<td>0.366</td>
<td>0.539</td>
<td>0.095</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile</td>
<td>0.321</td>
<td>0.612</td>
<td>0.067</td>
</tr>
<tr>
<td>Parents in the highest SES quintile</td>
<td>0.398</td>
<td>0.478</td>
<td>0.124</td>
</tr>
<tr>
<td>Parents in metropolitan areas</td>
<td>0.311</td>
<td>0.664</td>
<td>0.025</td>
</tr>
<tr>
<td>Parents in small towns and villages</td>
<td>0.492</td>
<td>0.225</td>
<td>0.283</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile in metropolitan areas</td>
<td>0.255</td>
<td>0.726</td>
<td>0.019</td>
</tr>
<tr>
<td>Parents in the highest SES quintile in metropolitan areas</td>
<td>0.345</td>
<td>0.620</td>
<td>0.035</td>
</tr>
</tbody>
</table>

Note: Sample is all those that make a choice of school on an LA application form. Non response and survey weights are applied. Other schools named by the parent (for example the first choice school) that were not inside 3km are not included in this table. FCS-T is all schools for which the pupil lives within 3km. FCS-C is all schools for which the pupil lives within the catchment area, which is defined as the straight line distance within which 80% of current reception class pupils live.
Table 4: Characteristics of schools within FCS-C

<table>
<thead>
<tr>
<th>Parent type</th>
<th>FSM</th>
<th>EAL</th>
<th>SEN</th>
<th>White British</th>
<th>KS2 Score</th>
<th>“Catchment area”</th>
<th>Number of schools in FCS-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>All parents</td>
<td>0.137</td>
<td>0.076</td>
<td>0.186</td>
<td>0.902</td>
<td>27.9</td>
<td>2646.885</td>
<td>4.784</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile</td>
<td>0.192</td>
<td>0.089</td>
<td>0.202</td>
<td>0.881</td>
<td>27.48</td>
<td>2197.676</td>
<td>4.933</td>
</tr>
<tr>
<td>Parents in the highest SES quintile</td>
<td>0.091</td>
<td>0.057</td>
<td>0.172</td>
<td>0.926</td>
<td>28.349</td>
<td>3061.631</td>
<td>4.721</td>
</tr>
<tr>
<td>Parents in metropolitan areas</td>
<td>0.185</td>
<td>0.161</td>
<td>0.181</td>
<td>0.796</td>
<td>27.84</td>
<td>2059.716</td>
<td>5.983</td>
</tr>
<tr>
<td>Parents in small towns and villages</td>
<td>0.069</td>
<td>0.011</td>
<td>0.172</td>
<td>0.976</td>
<td>28.27</td>
<td>4300.383</td>
<td>3.041</td>
</tr>
<tr>
<td>Parents in the lowest SES quintile in metropolitan areas</td>
<td>0.258</td>
<td>0.192</td>
<td>0.197</td>
<td>0.742</td>
<td>27.391</td>
<td>1824.449</td>
<td>5.975</td>
</tr>
<tr>
<td>Parents in the highest SES quintile in metropolitan areas</td>
<td>0.118</td>
<td>0.122</td>
<td>0.161</td>
<td>0.853</td>
<td>28.366</td>
<td>2306.949</td>
<td>5.784</td>
</tr>
</tbody>
</table>

Note: Sample is all those that make a choice of school on an LA application form. Non response and survey weights are applied. Other schools named by the parent (for example the first choice school) that were not inside 3km are not included in this table. The catchment area is defined as the area within which 80% of the pupils from that school are located, measured in km².
Table 5: The proportion of pupils that get their first choice school (as nominated on their LA application form), by the rank of the school in terms of KS2 mean attainment.

<table>
<thead>
<tr>
<th>Rank of choice</th>
<th>All students</th>
<th>Lowest SES quintile</th>
<th>Highest SES quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.91</td>
<td>0.8</td>
<td>0.91</td>
</tr>
<tr>
<td>2</td>
<td>0.93</td>
<td>0.93</td>
<td>0.95</td>
</tr>
<tr>
<td>3</td>
<td>0.93</td>
<td>0.93</td>
<td>0.93</td>
</tr>
<tr>
<td>4</td>
<td>0.95</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>5</td>
<td>0.97</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: The table gives weighted percentages. Schools are ranked from highest to lowest, so a rank of 1 indicates the most highly attaining school in the feasible choice set.
Appendix 1: Socio-economic status - Principle Component Analysis

We create a single measure of parents’ socio-economic status (SES) for our analysis instead of including many separate but correlated variables, following the method used by the IFS in recent work. We use principal component analysis (PCA) to identify the component which explains most of the variance in SES. Based on this “1st component” (which explains 42% of the variance in SES) we split the sample into quintiles. Those in the lowest SES quintile have the lowest SES, and those in the highest SES quintile have the highest.

The variables we used in PCA are as follows:
1) Whether the main respondent reported financial difficulties. This is a binary variable taken from wave 3 of the survey.
2) The highest National Statistics Socio-Economic Status (NSSEC) of the household, taken from wave 3 of the survey.
3) Housing tenure, taken from wave 3 of the survey. Whether the household lives in privately rented accommodation, social housing, or a mortgaged/owned property are entered as binary variables.
4) Logged equivalised household income. We average measures of household income over all waves, and weight for the number of people and type of person in the household using the McClemens score.

Household members were given the following scores to weight by:

<table>
<thead>
<tr>
<th>Member Type</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>First adult</td>
<td>0.61</td>
</tr>
<tr>
<td>Spouse/partner</td>
<td>0.39</td>
</tr>
<tr>
<td>Other second adult</td>
<td>0.46</td>
</tr>
<tr>
<td>Third adult</td>
<td>0.42</td>
</tr>
<tr>
<td>Subsequent adults</td>
<td>0.36</td>
</tr>
<tr>
<td>Dependant aged 0-1</td>
<td>0.09</td>
</tr>
<tr>
<td>Dependant aged 2-4</td>
<td>0.18</td>
</tr>
<tr>
<td>Dependant aged 5-7</td>
<td>0.21</td>
</tr>
<tr>
<td>Dependant aged 8-10</td>
<td>0.23</td>
</tr>
<tr>
<td>Dependant aged 11-12</td>
<td>0.25</td>
</tr>
<tr>
<td>Dependant aged 13-15</td>
<td>0.27</td>
</tr>
<tr>
<td>Dependant aged 16+</td>
<td>0.36</td>
</tr>
</tbody>
</table>