

School choice and equality of opportunity: an international systematic review

Deborah Wilson*, University of Bristol
Gary Bridge, Cardiff University

Report for the Nuffield Foundation
Project reference: EDU/42625

April 2019

Acknowledgements

The Nuffield Foundation is an endowed charitable trust that aims to improve social wellbeing in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at www.nuffieldfoundation.org

The authors would like to thank the Nuffield Foundation for funding this research. We also thank and acknowledge Llorenc O'Prey for his contribution to both the research bid and in carrying out the initial literature searches, and Dr William Turner for his help and guidance with systematic review methodology. All errors remain our own.

*Corresponding author: d.wilson@bristol.ac.uk



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Executive summary

The schools pupils attend and the education they receive matter for their further education and employment opportunities and future life chances. The mechanisms by which students are allocated to schools, and the ways in which different students are sorted across schools as a result, play a fundamental part in determining access to educational opportunities. Choice-based mechanisms as a means of allocating students to schools have been a focus for much policy implementation and debate across the globe, and are now incorporated in a variety of ways into a broad range of school admissions policies in different countries. The findings of this report are based on an international, interdisciplinary systematic review of the research on the effects of school choice on the allocation of pupils to schools.

The key objective of the project was to systematically scope and map the research evidence that relates parental exercise of choice to the institutional context in which it takes place (admissions policies) and, critically, to the outcomes of that process in terms of the resulting allocation of pupils to schools. By conducting an international, cross-disciplinary, systematic review of this subset of the school choice literature the aim was to contribute to the policy debates on the inequality of access to educational opportunity by addressing the following question:

What does research tell us about the effects of choice-based admissions policies on the allocation of pupils to schools?

- With regard to different types of pupil – in particular socioeconomic status; ethnicity;
- With regard to different types of choice-based admissions policies and institutional structures.

The report has several key findings:

- (1) School choice is associated with higher levels of segregation of pupils from different socio-economic and ethnic backgrounds between schools. This finding is consistent across all types of choice mechanism, in different countries, and across choice systems that have been in place for different lengths of time.
- (2) The reasons behind the observed increases are highly localized and contextual. Factors such as the size of school district, number of schools and mix of school types, the particularities of the choice mechanism, the social composition of neighbourhoods, lack of information and other constraints, as well as parental preferences all contribute to the resultant allocation.
- (3) A related finding is that higher levels in pupil segregation between schools may lead to schools being more homogenous in their social composition.

There are a number of conclusions of this review for current and future research and policy on school choice:

- (1) Although higher levels of segregation of pupils across schools is a consistent finding across school choice systems internationally, the specific reasons for that outcome

vary and indeed are highly contextualized. This makes identification of individual factors driving these outcomes extremely difficult, as there is no confirmation of causality in a conventional sense: different mechanisms and mixes of factors in different contexts lead to the same observed result.

- (2) The lack of availability of sufficient data across all the elements of school choice and allocation compounds the empirical challenges. More research evidence that links all these elements is required, in particular data on the sets of schools that parents are in practice choosing between.

The main conclusions for policy are:

- (1) Given the consistency of the result of higher segregation across schools, despite differences in system design, geography and duration, school choice is not the policy instrument by which the greater integration of pupils across schools, by socioeconomic status, ethnicity or faith, can be achieved.
- (2) Local context matters, both in terms of the schools from which parents can choose, and the overall allocation of pupils to schools. Any system of school choice therefore needs to take account of, and be sensitive to, these local variations in the overall allocation of pupils to schools.
- (3) Because the reasons for the observed increases in between-school segregation of pupils are localised and contextual and relate to areas of school choice that are at a greater scale than individual school catchments, the coordination of admissions (including for schools that are oversubscribed) should be conducted at a local authority (or equivalent) level, rather than being at the discretion of individual schools.

Education is a key factor in enhancing equality of opportunity, social mobility and social cohesion. This report focuses on one aspect of educational equality of opportunity: that of access to schools and, in particular, choice-based systems as the means of allocating pupils across schools. If we consider more integrated patterns of allocation as a contributory factor to equality of opportunity, the results in this report suggest that school choice is not the means by which such opportunity is enhanced.

Introduction

The schools pupils attend and the education they receive matter for their further education and employment opportunities and future life chances (Watts 2013). How the schooling experience differs across students from different backgrounds therefore remains an important issue. There is a persistent social gradient in educational attainment, for example, with students from disadvantaged backgrounds tending to perform less well on average (Department for Education 2014); working class children tend to go to lower performing schools (Burgess, Greaves, Vignoles and Wilson 2011; Lauen 2007); and schools with an overconcentration of disadvantaged pupils tend to have lower average educational attainment (Coldron, Crips and Shipton 2010). The mechanisms by which students are allocated to schools, and the ways in which different students are sorted across schools as a result, thus play a fundamental part in determining access to educational opportunities.

Choice-based mechanisms as a means of allocating students to schools has been a focus for much policy implementation and debate across the globe (Berends et al 2011) and are now incorporated in a variety of ways into a broad range of school admissions policies in different countries. Parental choice of school has been part of the English education system since 1988 and is similarly well established in countries such as the United States, Chile, Sweden, and increasingly across Europe (Allen and Burgess 2010; Benson, Bridge and Wilson 2014; Butler and van Zanten 2007).

While the rhetoric of school choice tends to focus on its potential for improving educational outcomes (often measured in terms of test scores, progress, or value added (Wilson and Piebalga 2008)), another key outcome of choice is the way in which different types of pupil are allocated or 'sorted' across different schools. As well as determining the composition of each school's student body, pupil sorting potentially has knock-on effects on neighbourhood composition, often via the links between the housing market and the 'market' for schools (Fack and Grenet 2010 and references therein). Urban research has increasingly acknowledged the significance of the social and spatial composition of schools for the socio-spatial dynamics of cities (Butler 1997; Butler and Van Zanten 2007). Moreover, school peer groups are widely thought to be important for children's development and their academic progress (Atkinson, Burgess, Gregg, Propper and Proud 2008). If peer groups matter, the ways pupils are sorted across schools has implications for educational outcomes as well as equity of access (Burgess, McConnell, Propper and Wilson 2007).

Despite its political popularity, parental choice of school and its effects is a somewhat contested field. Exponents have variously argued that school choice can increase equality and educational attainment in education, whilst critics of choice have countered that it in fact increases inequality and inefficiency (Burgess et al 2011; Fowler 2002). Both sides have claimed to hold the theoretical and empirical imperative (Bridge and Wilson 2015), while the evidence to support either side is much less conclusive (Wilson 2013). The huge range of what 'choice' means in practice in different institutional contexts adds further layers of complexity: in practice, the nature and extent of choice reforms have been diverse and uneven, both within and across different countries and education systems. While choice is a commonly used term in current policy discourses, the outcomes of any specific choice-based mechanism for different types of pupil in different geographical locations depend on the

institutional design of admissions policy, the organisational culture, and the incentives thereby created for the different actors involved (families, schools, local and national government).

This report aims to make a timely contribution to the current policy debate on the role and effects of choice-based admissions mechanisms in compulsory education. The report's findings are based on an international, systematic review of the research on the effects of school choice on the allocation of pupils to schools. It conforms to the Nuffield Foundation's Review and Synthesis mode of research and directly addresses the Foundation's concern with secondary education transitions: a key branching point in pupils' educational careers and one that has ongoing significance for educational outcomes and opportunity. Details of how we carried out this review, which adhered to systematic review protocols, are given in the methods section below.

Aims of the study

The aim of this project was to conduct an international, cross-disciplinary, systematic review of the school choice research in order to contribute to the policy debates on the inequality of access to educational opportunity by addressing the following question:

What does research tell us about the effects of choice-based admissions policies on the allocation of pupils to schools?

- With regard to different types of pupil – in particular socioeconomic status; ethnicity
- With regard to different types of choice-based admissions policies and institutional structures

Objectives of the study

The key objective of the project was to systematically scope and map the research evidence that relates parental exercise of choice to the institutional context in which it takes place (admissions policies) and, critically, to the outcomes of that process in terms of the resulting allocation of pupils to schools.

As this was an international review, we were able not only to consider numerous different school choice mechanisms (described below) but also the extremely broad range of national and regional contexts in which school choice policies have been introduced (again, we provide details of the geographic spread of the literature below).

Conducting such a review enabled us to take a step back from individual systems' institutional detail and instead consider the broader themes and outcomes that have been found in the literature across these numerous different systems of school choice. This in turn enabled us to (i) identify any gaps in the research base and recommend future research initiatives to address these gaps; (ii) identify common themes across the research base that provide evidence to inform policy.

Methodology and data analysis

Context

As stated above, the focus of our review was the literature that links the process of parental exercise of choice to the resulting allocation of pupils to schools. The ways in which parents exercise school choice affect the outcomes of any school choice mechanism, and we distinguish three distinct components of that process: the choice of schools the families have in practice (their choice set), the wide range of factors, information and individual preferences that inform their decision (choice dynamics), and the decision they finally make (their actual choice, or nominated school). This actual choice may not be achieved in practice due to allocation mechanisms that map from the parents' nomination to the actual school attended as part of the overall choice-based admissions policy (Burgess et al 2015).

There is a real empirical challenge in identifying which of these element(s) of the school choice process are contributing to the resulting allocation of pupils across schools. This is acknowledged in the literature that we reviewed and is often due to limitations in the availability of sufficient data; we return to this point below. As a result, it is often not clear whether the observed outcomes have been driven by real 'choice' or preferences, or rather by the constraints on that choice as experienced in different geographical contexts by different types of family. Caution is therefore required in drawing inferences from the evidence, in particular with regard to policy implications and, crucially, the most appropriate policy response.

To summarise: our research aimed to systematically review studies using a conceptual framework that positions the exercise of choice within the institutional context provided by specific admissions policies and relates that to the resulting allocation of different types of pupil across different schools.

An international, systematic review

In order to deliver the objectives set out for this research, we undertook a systematic review that included research from all social science disciplines, situated across all potential national contexts. We were purposely broad in scope and sought to pull together all the existing research on our particular topic, analysing trends, finding common themes and identifying limitations in that body of scholarship. In designing the project methodology, we drew on guidance from the literature on integrative review methodology (Cooper, 1982; Jackson, 1980; Whitemore and Knafel, 2005). This is a particular type of systematic review that enabled us to take a more expansive view of the types of research that can be included, considering experimental and quasi-experimental research, in-depth qualitative studies and observational studies including correlational designs. We also extended our search to include theoretical papers relevant to our key questions.¹

¹ As we discuss below, however, due to the exacting nature of the data required for studies focusing on our specific research question, the papers that comprised our final dataset all employed quantitative methodologies.

The search was purposely broad in scope; aiming to explore and map the literature across a potentially extremely diverse range of international and institutional contexts. We therefore employed a suitably broad definition of school choice as a starting point for our search strategy:

Choice-based admissions policies are those which seek to provide families with a degree of discretion in the selection of the school their children will attend. This includes policies that give families at least two options, with parents able to express a preference regarding which school they would like their children to attend.

Given that broad definition, we employed clear inclusion and exclusion criteria to create boundaries for our search in what is an extremely large body of related work. For a study to be included in our dataset, it had to include information on **all** of the following:

Inclusion criteria:

- Choice-based admissions policy (as defined above) within a predominantly state-funded education system
- Compulsory education (primary or secondary school choice or equivalents)
- Allocation of pupils to schools
- Pupil and/or family socio-demographic characteristics (socioeconomic status; ethnicity; religion; ability)

Similarly, we defined clear exclusion criteria which formed the basis on which we took decisions to exclude studies from our dataset:

Exclusion criteria:

- Theses, dissertations, commentaries, editorials
- Non English language texts
- Research that 'only' considers the effect of school choice on pupils' attainment (including choice of within-school tracks)
- Level of analysis at district / local authority level or above (for example national or cross-country analyses)

There are several points to note regarding the consequences of our search criteria. First, our exclusion of non-English language texts inevitably skews the dataset towards Anglo Saxon countries. As we show in the next section, however, our dataset does include studies from a range of cities and countries across the Global North and South. Second, we explicitly focused on choice-based admissions policies within a predominantly state-funded education system. We didn't include studies that solely focus on parents choosing private schools *per se*; but our dataset does include state-funded school choice systems within which the choice of a private school – via the use of a voucher, for example – is one option for parents. An analysis of public-private schooling differences, or the differences in private schooling across

different national contexts, is therefore outside the scope of this report.² Third, the research that includes both details of the school choice mechanism and final allocation of pupils to schools is quantitative. This is in part a result of the exacting nature of the data required: to include choice and allocation at a household level but with sufficiently large data sets to elicit patterns of choice, allocation and resulting sorting across schools.

Before turning to a discussion of our data analysis, it is important to emphasise the consequences of our criteria for the subsequent set of studies both included in – and excluded from – our review. To reiterate, our focus was on studies that use pupil-level data by household to investigate patterns of the resulting cross-school pupil allocation, given the admissions policy framework within which school choice is exercised. This is obviously, therefore, only a small slice of what is a much broader literature that encompasses other aspects of school choice. In particular, our review does not cover the literature that connects school choice with residential mobility; or outcomes of school choice at an inter-district or national level. One way to think about the literature that we focus on is as follows:

‘Student sorting is likely to occur in two stages. First, families live in the neighbourhoods of their choice. Part of their location decision is based on securing attendance for their children at the schools they view as being of the highest quality.... Second, given the choice of where to live, families may take advantage of policies, such as open enrolment, that allow for increased choice. These policies may increase or decrease the existing level of sorting’ (Leonard, 2015: 5283).

In Leonard’s terms, therefore, our review focused on the second stage of the sorting effects of alternative school choice mechanisms. The two stages are of course linked: given that parental choice of home location is partly based on the chances of securing a place at their most preferred school, changes to the mechanism by which such places are allocated will affect that decision (Burgess 2016). Our review does not explicitly consider these connections; rather our findings provide evidence on whether policies such as open enrolment exacerbate or reduce the sorting patterns that have resulted from residential mobility; we discuss this further below.

Search strategy, data extraction and data analysis

The search strategy combined electronic searches of a broad range of general and specialist databases, supplemented by hand searches of the bibliographies, reverse citation mapping of relevant studies and additional searches of the relevant grey literature. The initial search strategy yielded a total of 559 studies. Two rounds of screening, adhering to systematic review protocols, were undertaken by both authors. At the first screening stage both authors independently screened titles/abstracts of all 559 studies against the above

² Burgess (2016) discusses the economics literature on choice of private school. He refers to the OECD (2012) report that both highlights the variation of private school attendance across OECD countries and shows that the socio-economic stratification across schools is associated with the level of public funding to, and not prevalence of, private schools.

inclusion and exclusion criteria, with discrepancies discussed on a case-by-case basis. 169 studies were taken through to the second stage. Both authors independently analysed the full text of all 169 studies to determine whether they fully fitted all the inclusion criteria. All discrepancies were again discussed on a case-by-case basis. This yielded 64 papers that formed the final dataset.

Data extraction was carried out by both authors after a process of moderation and following systematic review protocols (Pawson et al 2005; Whitemore and Knafl 2005).

Categorizations for the extraction were agreed a priori and the results inputted into a shared excel spreadsheet. Key elements of the data extraction included: geographical location; pupil/family characteristics; stage of education; research design; details of specific school choice mechanism; final pupil allocation; results. The full list of categories is available in Table A1 of the Technical Appendix that accompanies this report. Each study was additionally assessed for methodological rigour and theoretical consistency according to pre-defined protocols. These included criteria of consistency of theoretical exposition and degree of consistency between theoretical approach, research design and interpretation of findings, as well as categorisation of papers in terms of robustness of research design, data measurement specification and threats to validity (details in Tables A2 and A3 in the Technical Appendix).

Data analysis in research reviews 'requires that data from primary sources are ordered, coded, categorized and summarised into a unified and integrated conclusion about the research problem' (Whitemore and Knafl, 2005: 550). There is inevitably some degree of subjective interpretation when analysing the data from such a broad range of primary sources (Cooper, 1982), hence the need to be explicit regarding both the categorization rules by which the data has been extracted (above and Tables A1-A3) and the principles guiding the subsequent analysis.

Our core focus was the relationship between key elements of the choice system and the final allocation of pupils to schools, focusing primarily on differences across socioeconomic status and ethnicity. We employed an iterative process of examining the primary data in order to identify patterns and relationships between these. Here we drew on realist synthesis approaches (Pawson et al., 2005; O'Campo et al., 2015) which aim to identify how a particular programme – here, school choice – works for whom and under which circumstances. We first identified patterns across the different school choice mechanisms investigated in the studies, which enabled us to thematically code each study within two broad classifications of school choice: opt out and open enrolment, discussed below. This further enabled initial geographic classifications in terms of where different forms of school choice are employed at a national, regional and city level. Within these broad categorisations we identified three key elements common across each: type of schools to which pupils are allocated; process of allocation; method of payment: all discussed further below. We then reviewed the studies in terms of the pupil/family characteristics employed to draw out patterns of the differential effects of school choice allocations across socioeconomic status and ethnicity (faith was also a characteristic investigated but by a

much smaller subset of studies). Together, these iterative processes of examining the primary data enabled us to identify patterns and relationships between the key elements of different choice mechanisms and the final allocation of pupils across schools. Measures of segregation (and changes in segregation) across schools were recorded from the studies themselves, those studies having met the systematic review criteria on theoretical and methodological consistency, methodological rigour and the treatment of data at the finest (pupil/household) level of discrimination.

Results

1 An initial mapping of the literature

Our systematic review yielded a dataset of 64 papers (full list of papers available as part of the Technical Appendix). While the disciplinary spread of the studies across social sciences is quite broad, encompassing economics, education, geography, sociology, policy studies and management, all 64 papers employed quantitative methodologies (multivariate regression analyses; quasi-experimental research design; simulation modelling, for example). Most studies were based on large administrative datasets that included final allocation data; a minority analysed large scale household surveys. The requirement to analyse studies that included both choice and allocation, at household level but with sufficient numbers to establish robust patterns, resulted in this discrete slice of the literature. The inclusion/exclusion criteria involved to achieve this selection meant that some of the more familiar studies on urban schooling and parental choice (such as the large qualitative literature on the dynamics of parental choice) were excluded from this review.

Pupil or household characteristics were mostly defined by socioeconomic status (SES) and/or ethnicity. Ethnicity and 'race' were particularly prominent in US studies, which is unsurprising given the concerns with residential segregation of African Americans in US cities. Pupil ability was an element in 19 of the 64 studies but alongside measures of SES and ethnicity (except for two ability-only studies). Ability does not feature strongly in the findings we report from the studies in this review because our particular focus was on the effect of choice on allocation rather than subsequent attainment (where discussions of ability peer effects feature much more). Six studies included faith but again alongside SES and ethnicity. In these cases (predominantly the Netherlands and Germany) allocation to denominational schools has been much more typical in the past.

There are numerous school choice systems internationally, as well as different systems sometimes operating within the same national context: there is considerable variation across the states of America in terms of their organisation of school choice and other education policies, for example. We explicitly did not set out to map and describe the institutional details of individual school choice mechanisms and policies in each context. Rather, our aim was to take a broader overview; to look across these different systems in order to draw out common elements, themes, outcomes: this is one of the key added values of our chosen methodology. Here, therefore, we list these common elements across the two broad categorisations of school choice system that we derived from our analysis; 'opt-out

from geographically assigned state school', and 'open enrolment'. For 'opt out' the starting point is essentially neighbourhood schooling, i.e. pupils are initially assigned a school on the basis of their place of residence. For 'open enrolment' families are able to express a preference for the school(s) they would like the child to attend. Such preferences may be constrained by the range of schools available in practice, and/or may not be realised, due to the various constraints on capacity, travel etc. Our categorisations mirror the two types of school choice system that Burgess (2016) distinguishes, respectively an individual entitlement to attend a different school to your current one, and a systemic market rule for assigning all pupils to schools. While necessarily broad, the aim is to capture key features within – and constraints across – these categorisations.

Table 1 summaries the key features of our categories of school choice system, along with information on where these systems are employed, by nation, region and city. The evidence on the effects of different 'opt out' mechanisms, for example, is overwhelmingly based on the US experience; while 'open enrolment' is employed across a much broader range of countries.

There are several constraints that cut across both these broad categories of school choice systems. One is the limited capacity of (at least some, popular) schools, leading to the need for over-subscription criteria by which places at such schools are allocated. Straight-line distance from a family's residence to the school is a common criterion of allocation in case of over-subscription. This re-introduces a geographical component to allocation that the parental choice system was often intended to counter. It therefore re-establishes the capacity of superior choice for higher income families who can afford property close to oversubscribed schools. Those schools tend to be high performing (though this isn't always the case) and so the inequalities are compounded. The specific geographical context also determines the particularities of each family's choice set and the range of schools from which they can choose. This can include not just the number and type of schools available for choice, but also what is effectively available in terms of accessibility by public transport (if necessary). The number of oversubscribed schools in a choice set also affects parental choice in practice, especially for lower income families who can't buy the often more expensive property closer to these popular schools. The socioeconomic context therefore places differential constraints on families in terms of their residential location; travel costs to alternative schools; ability to pay any required 'top-up' or other costs to attend their school of choice. Even the built form of the city (roads, intersections, safe routes for children) can influence how and to what extent certain schools figure in the feasible choice set for different families.

Table 1: Two broad categorisations of school choice system

	Types of school to which pupils allocated	Process of allocation	Method of payment	Geographical representation of school choice system in our dataset
OPT OUT	<ul style="list-style-type: none"> - Alternative state schools - Semi-autonomous state schools (eg charter and magnet schools in USA) - Private schools incorporated in state-funded choice system 	<ul style="list-style-type: none"> - Schools as own admissions authorities with particular selection criteria (sometimes including top-up fees) - District-level allocation rules, eg: proximity; lottery 	<ul style="list-style-type: none"> - Per capita funding - Vouchers: <ul style="list-style-type: none"> (a) universal – available to all pupils wanting to opt-out (b) targeted – at particular groups of (disadvantaged) students; or at students attending a ‘failing’ school 	<p>North America:</p> <p><u>USA:</u></p> <ul style="list-style-type: none"> - National: 6 papers - State: 7 papers (<i>Florida (2); Texas; North Carolina; Arizona (2); Michigan</i>) - City: 12 papers (<i>New York (2); Montgomery County; Milwaukee; Chicago; Charlotte-Mecklenburg; anonymous urban district; Washington DC; Philadelphia; Durham NC; San Diego; Indianapolis</i>) <p><u>Canada:</u> 1 paper (<i>Greater Toronto</i>)</p> <p>Europe:</p> <p><u>Germany:</u> 1 paper (<i>Wuppertal</i>)</p> <p><u>Scotland:</u> 1 paper</p>
OPEN ENROLMENT	<ul style="list-style-type: none"> - Alternative state schools - Semi-autonomous state schools (eg free schools and academies in England) - Private schools incorporated in 	<ul style="list-style-type: none"> - Schools as own admissions authorities with particular selection criteria (eg: faith; ability) - District-level allocation rules, eg: proximity; lottery 	<ul style="list-style-type: none"> - Per capita funding (within state sector) - Universal vouchers; used to include choice of private schools within system of choice 	<p>South America:</p> <p><u>Chile:</u> 6 papers (<i>Santiago (2); 6th region; national data (3)</i>)</p> <p><u>Brazil:</u> 1 paper (<i>Rio de Janeiro</i>)</p> <p>Europe:</p> <p><u>England and Wales:</u></p> <ul style="list-style-type: none"> - National: 8 papers (7 England; 1 England and Wales)

	state-funded choice system			<p>- City: 4 papers (<i>Brighton and Hove; London; Birmingham; anonymous (Wales)</i>)</p> <p><u>Sweden</u>: 4 papers (<i>Stockholm; national data (3)</i>)</p> <p><u>Spain</u>: 2 papers (<i>Barcelona; Aragon</i>)</p> <p><u>Germany</u>: 3 papers (<i>N Rhine Westphalia; Essen; Wuppertal</i>);</p> <p><u>Netherlands</u>: 2 papers (<i>four cities; national data</i>)</p> <p>Rest of the World:</p> <p><u>New Zealand</u> (<i>Auckland, Wellington, Christchurch</i>)</p> <p><u>South Africa</u> (<i>Cape Town</i>)</p> <p><u>Zimbabwe</u></p> <p><u>Japan</u> (<i>Tokyo</i>)</p> <p><u>China</u> (<i>Changsha</i>)</p> <p><u>South Korea</u></p>
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2 Research evidence

The objective of this systematic review was to encompass the full range of geographical contexts and school choice mechanisms in order to identify common themes and/or patterns in the impact of school choice on the sorting of pupils across schools at different national, regional and urban spatial scales. As discussed above, the review involved explicitly looking across systems within each of our categorisations and then drilling down to specific regional and urban contexts in order to test out any emerging patterns by different pupil/household characteristics. With reference to Table 1, therefore, we start by discussing the findings from studies in each of our categorisations in turn, before drawing out the common themes we subsequently identify across these different categories and geographies. In the discussion that follows the numbers refer to the unique identifier for each study in the dataset, as detailed in the Technical Appendix.

Open enrolment

Some of the strongest evidence on the effects of open enrolment systems comes from Chile, which introduced school choice in a nationwide policy reform in 1981. Public schools were transferred from central to local government and parents were given ‘total freedom’ [34; page 201] to apply to any subsidized private or public school, which in turn received a per-student voucher. Schools were free to select pupils from the pool of applicants (we return to this point below).

As detailed in Table 1, there are six papers in our dataset that investigate the effects of that reform, at national [30; 54; 72], regional [67] and city level [34; 154 – both Santiago]. Together these provide a strong body of evidence on the effects of an open enrolment school choice mechanism on the socioeconomic sorting of pupils. This is for two reasons: first, the research designs are robust, exploiting the nationwide introduction of the same school choice system using primarily multivariate regression analyses including regression discontinuity methods and simulations. Second, the papers provide evidence of the effects of the same nationwide policy reform at different geographical scales: national, regional, city.

The clear finding from this set of papers is that school choice increased social segregation across schools in Chile. This is over and above residential segregation patterns [72], thus showing the additional impact of school choice on segregation, and with little related evidence of any improvements in test score outcomes [54; 67]. But what is underlying this result in the Chilean context? This body of evidence suggests a combination of parental preference and school selection, both working towards increased social stratification. One of the Santiago studies [154] analyses survey data to investigate parents’ stated preferences (what they say they want in interviews or on surveys) and revealed preferences (what they actually choose on the school choice form) across schools, and shows that, while few cite social class as a choice factor, most include only schools with similar student demographics in their choice sets. This is a broader theme we discuss later in the report. [54] argues that schools have responded to the reform by selecting certain types of student (with higher socioeconomic status or ability) rather than raising productivity (measured in pupils’ exam

scores and other performance management measures), highlighting the need to regulate admissions criteria. Again, we return to this below.

Another strong body of evidence comes from the school choice system that has been in place in England and Wales since the national reforms of 1992, which introduced open enrolment, local management of schools and per capita funding, with the funding following the pupil's allocation. The majority of papers from England use the same national, pupil-level administrative data that links pupils to their school and records their test scores at different key stages. This annual census also includes pupil characteristics such as free school meal eligibility (widely used as an indicator of socioeconomic status) and ethnicity and, crucially, pupils' home postcodes, which enables detailed analyses of the effects of choice on residential and school segregation across different urban contexts. The English evidence base in our dataset therefore uses the same data and pupil indicators in a range of robust, multivariate, predominantly econometric and geo-spatial research designs.

While a couple of papers find little evidence of increased socioeconomic segregation (see [44] for England and [42] for England and Wales), the findings from the majority of studies of the English open enrolment system corroborate those from Chile: school choice is associated with increased socioeconomic segregation across schools [165; 158; 16; 17; 168; 84]. Central to these results is the finding that between-school segregation levels are higher than those presented by residential patterns [17; 16] again pointing to the additional effect of choice systems on segregation. This is also found to be the case in a geo-spatial study of ethnic segregation in Birmingham and London [46], for example, particularly for pupils of Black Caribbean heritage.

Two further results from the English open enrolment system are worth highlighting. First, there is evidence of social polarisation in school populations, with the most popular schools in a district gaining a more advantaged intake and vice versa [169]. [18] reinforces this message with its finding of systematic differences in the sorting of low and higher income pupils between low quality and high quality schools. Second, a careful study of the urban district of Brighton and Hove [168] employed a 'before and after' research design to investigate the effects of replacing proximity-based allocation with a lottery in the case of oversubscribed schools. The authors' prior hypothesis was that this policy change would lead to lower socioeconomic segregation, with the lottery weakening the link between residential location (and house prices) and allocation to popular, oversubscribed schools. Their hypothesis was not supported by the results, however, which they ascribed to the way catchment areas had been re-drawn as part of the reform. The design details of the school choice mechanism – here, the drawing of the geographical boundaries within which lotteries across schools will be held – matters; we return to this point below.

As Table 1 illustrates, the 'open enrolment' school choice system operates in a wide range of countries across the world. Our review therefore provides evidence of the effects of this choice mechanism across a broad range of contexts at different geographical scales: national; regional; city. There is evidence on the effects of open enrolment on ethnic

segregation between schools from Sweden [11; 13; 93], Germany [79; 58; 103] and the Netherlands [25; 57], with patterns largely, but not fully, attributable to residential segregation. In Spain [66; 156], open enrolment is shown to increase SES segregation between state schools and those private schools incorporated into the state-funded choice system, with the authors of the Aragon study [66; page 105] arguing that ‘positive discrimination measures in favour of the least well-off families’ will be needed to facilitate school choice across all sociodemographic groups. Other studies highlight specific points which have wider relevance for the operation of school choice systems. The Zimbabwe study [114], for example, notes the fundamental constraints on choice for rural communities; while a study from Cape Town [51] shows little relationship between choice and SES, which the authors explain through school choice reflecting racial history and perception of opportunity in the current South African context.

Opt out

The vast majority of the evidence on ‘opt out’ school choice mechanisms included in our dataset comes from the USA. This evidence builds on and complements that from open enrolment in several ways. First, the focus of the US literature is on changes in segregation by ethnicity as well as by socioeconomic status. Second, there is a range of different mechanism designs within the broad ‘opt out’ framework that enable us to build a broader picture of the effects on pupil allocation of alternative school choice policies. In particular, a key distinction is whether the opt out program is targeted at a specific sociodemographic or is more universally applied. As above, we present the broad results of the systematic review, illustrating them further by drilling down into particularly robust examples (in terms of the quality of the data sets and sophistication and rigour of methods/analysis – see Technical Appendix) across different geographical scales.

There are fourteen papers in our dataset that investigate the effects of charter and/or magnet school choice on pupil allocations, across a range of US geographies, both in terms of scale and location. Three are national [118; 131; 27]; five at state level [North Carolina 8; Texas 122; Michigan 130; Arizona 35; 36] and six at city or county level [Washington DC 55; Indianapolis 65; Durham NC 9; Montgomery County, Maryland 160; Philadelphia 78; San Diego 133 (we discuss this last study further below)]. The over-riding result across all these studies is that the charter school program in particular has exacerbated between-school segregation by both socioeconomic status and ethnicity. There is a clear distinction between these schemes and the more targeted design of some of the magnet school programs. However, even though the latter are often designed and targeted to explicitly reduce segregation, the three city level studies in our dataset [Montgomery County 160; Philadelphia 78; San Diego 133] all show that this is not the end result; specifically that any decreases in segregation for magnet schools are outweighed by greater segregation overall in neighbourhood schools.

This pattern is corroborated by the studies in our dataset that focus on US voucher programs, all of which use national data. [157] uses national survey data in a multivariate model to simulate the effects of voucher introduction and reports that ‘startling differences

between movers [families that opt out to another school] and stayers [that accept their designated school] exist with regard to family income, whether parents attended college, and race' [157, page 304]. The authors state, therefore, that they expect a universal voucher policy to exacerbate economic and racial segregation in urban public school environments. Even the studies investigating vouchers targeted at low-income families reveal a mixed picture, again across geographical scales and locations [national 135; Florida 139; Milwaukee 24; New York 134], with some evidence of differences across both income and ethnicity at application and/or enrolment stage. In Milwaukee [24], for example, there is no stratification by SES at application stage, whereas there is at the point of enrolment. The authors attribute this to the costs (of transport, for example) associated with enrolling at a non-neighbourhood school.

Overall, therefore, the picture that emerges from this section of the evidence base is that even targeted schemes are not wholly successful at reducing segregation, and more universal schemes are actively associated with an increase in segregation, with respect to both social class and ethnicity. A closer look at three key studies in different urban contexts reveals more about what is underlying these results.

Koedel et al (2009) [133] evaluate the integrating and segregating effects of three distinct school choice programs in the same city (San Diego Unified School District); two explicitly designed with integration as an explicit objective; the third a state-mandated, open enrolment program. The authors find that the former two increase integration whereas the latter segregates the district's schools. Issues of access – and in particular travel constraints – are shown to be key in this context: the integrating programs provide transport for student participants while the open enrolment program does not. Disadvantaged students are underrepresented in the open enrolment program. Given that all choice applicants choose schools with more socioeconomically advantaged peers (in turn, correlated in this context with choosing 'more White' schools), this provides one explanation for the observed differences in outcomes across the programs: participation by disadvantaged students tends to increase integration, while their non-participation exacerbates the tendency towards increased segregation. This effect is corroborated by evidence from an opt out system in Germany [88]. We discuss this further below.

The effects of the underlying preferences of parents and students are also emphasised in two studies that investigate the charter school system in North Carolina – at state and city (Durham, NC) level [8; 9]. Both papers find charter schools are associated with higher levels of segregation; with higher effects across income than ethnicity in Durham, NC [9]. The patterns underlying these results are somewhat nuanced, however. In both papers the authors find that White students are more likely to make segregating choices, while the observed segregating choices by Black students are in fact sometimes driven by the lack of more mixed alternatives within their neighbourhood. Echoing Koedel et al (2009 [133]) the authors [9] conclude that the integrating effects of choices by disadvantaged students seeking higher achieving schools are outweighed by the segregating effects of choice from their more advantaged peers. Both underline the importance of the constraints in driving

the observed outcomes; fundamentally linked to residential segregation patterns in the specific urban context, the mix of schools from which to choose within the locality, and the cost of transport required to access alternatives further afield.

3 Key findings

The key findings of our international, systematic review are as follows:

(i) School choice is associated with higher levels of segregation of pupils between schools

This is a consistent finding across a number of criteria. It is consistent across different types of choice mechanism, as categorised by ‘opt out’ and ‘open enrolment’ above.³ It is also observed in a wide range of different national, regional/state and city contexts and across systems that have been in place for varying lengths of time. At the smallest spatial scale, for example, it is consistent across different urban contexts and their contextual complexities of choice system(s); size of school districts/catchments; the number of schools and degree of competition in the area, and the existing socio-economic geographies of the neighbourhoods involved. The finding also holds across a range of socio-demographic characteristics against which segregation is measured: socioeconomic status, ethnicity and faith (although this last finding is based on a much smaller subset of studies). Higher levels of segregation are also consistent across the different systems of allocated places to schools that are over-subscribed, including as allocation by residential proximity, or through the operation of a lottery, the latter intended to allocate to oversubscribed schools regardless of pupil type or geographical distance from home to school. If we think of segregation as a form of systematic bias in allocation (either through choice or selection/mechanism design) lotteries would appear to be the option least vulnerable to such bias. The most common explanation offered in the research studies that deal with lotteries is that of the particularities of boundary drawing and the geographical limits within which the lottery operates, suggesting that geography still has an impact. Higher segregation in school allocations via a lottery might simply reflect the prevailing socio-demographic geography of the areas around which the boundaries are drawn (this was certainly the case for the lottery introduced in Brighton and Hove, England for example (Allen et al 2010)). It should be noted that we are not able to draw conclusions about which oversubscription device is ‘more’ or ‘less’ segregating; rather we observe a more general finding that school choice systems that employ either are associated with higher levels of between-school segregation. Less surprising is the finding that between-school segregation is exacerbated in systems in which schools are their own admissions authorities.

More generally, our finding that school choice is linked with higher levels of between-school segregation leads to the question of ‘relative to what’? What is any one current system of school choice being compared to, in terms of resulting outcomes? Again there was a range of scenarios that the studies we reviewed had investigated. The studies investigated the

³ Not including some specific, targeted, magnet school programs in the US, as discussed.

allocation of pupils to schools under a school choice mechanism relative to: the policy that pre-dated school choice being introduced [see, for example, 49; 82]; a comparison of geographical areas that have more choice options relative to other areas where choice is more limited [46]; the introduction of vouchers that provide pupils with a choice of school other than the one to which they had been assigned [135] and the residential levels of segregation observed in a system of location-based school assignment [11; 84]. We are not able to comment on the relativities between the degree of segregation from school choice and each of these comparators; indeed they are not always mutually exclusive: as discussed above, households may react to – or pre-empt – the introduction of school choice via residential moves, for example. What we are able to say is that, in comparison to the range of alternative allocation mechanisms investigated by the research evidence we reviewed, the consistent finding is that school choice is associated with higher levels of between-school segregation.

(ii) The reasons behind the relationship between school choice and between-school segregation are localised and contextual

Although choice is associated with higher segregation between schools across all the different choice mechanisms included in our review, the reasons why this is the case were more contextual. The size of the school district, number of schools, particularities of the choice mechanism, composition of neighbourhoods – are all discussed in the different studies as contributing to the resulting allocation, reflecting the importance of context and the particularities of school choice. Context may include historical factors, such as the apartheid legacy in South Africa [51] or the history of racial residential segregation in the US [9], resulting in segregated choice sets in many locations. Equally, prior residential sorting or the differentiation of feasible choice sets for lower income families in England indicates the significance geographical and socioeconomic factors in understanding processes and outcomes of choice in different localities [17]. Parental preferences are undoubtedly part of the story, and the studies in our dataset reveal differences across both socioeconomic status [154] and ethnicity [133]. But it is not only differences in preferences that are driving the observed outcomes. The outcomes of any choice-based mechanism are a result of a combination of factors, including system design, constraint, lack of information, as well as any parental preference. These combinations of alternative, non-mutually exclusive, explanatory factors in what is a consistent result across the literature links to the problems of identification discussed earlier.

(iii) School choice may lead to more homogenous school composition

This finding is a consequence of the first: segregation and composition are linked, in that segregation results in more homogenous school composition. Again, however, there are various reasons behind this discussed in the literature. Some choice systems exacerbate segregation though competition in cases of over-subscription: for example the use of a proximity criteria in an open enrolment system may mean that middle class households are able to gain admission to certain schools through being able to afford to move near such

schools [17]. In an opt-out system there may be a double effect on school composition: studies of the charter school system in the US found that this system exacerbates between school segregation and homogeneity of composition with respect to both the charter schools moved to and the public schools that are vacated [78].

The studies included in our review mostly focused on the segregation in allocation issue rather than on the type and quality of destination schools. However from the evidence that was available on the composition and school type that results from segregation there are studies across several countries that suggest that in systems of school choice, disadvantaged pupils are over-represented at more poorly performing schools [18].

Implications for current and future research and policy on school choice

We have already noted that, although higher levels of segregation of pupils across schools is a consistent finding across school choice systems internationally, the specific reasons for that outcome vary, and indeed are highly contextualised. Two points follow from this. First, identification of individual factors driving these outcomes is extremely difficult, as, therefore, is any confirmation of causality in a conventional sense. We were able to draw out this main finding across different national contexts, but the underlying reasons why are less easy to report because there are many different mechanisms that lead to this same outcome. This again relates to the point about the difficulty of identifying the causal influences in different contextualised cases. The components that are identified in the various studies are dealt with systematically utilising robust methodologies (predominantly quantitative multivariate analyses) based on large administrative data sets and household surveys. These all point to the finding that school choice is associated with higher levels of segregation but also that the particular means by which that occurs vary and are highly contextual. A key priority is systematic collection of the data required to identify the different elements of the school choice process.

Second, the lack of availability of sufficient data across all the different elements of school choice compounds these empirical challenges. This again emphasises the importance of context in understanding the relationship between school choice and between-school segregation. As previously discussed, the actual parental exercise of choice is somewhat of a black box in this literature. This is partly because tying all the links together – the admissions policy; the choice set; the choice dynamics; actual choice; and pupil allocation to school – is extremely demanding both in terms of data and of identification of the separate effects. Many studies only look at one or two of the components of the exercise of school choice. Nevertheless, in our review we were able to identify and focus on studies that linked the overall exercise of choice within a range of school choice mechanisms and the actual allocations of pupils across schools that results.

One particular issue (recognised in the studies themselves) is the need for more information on the sets of available schools from which different parents can choose. Given our finding that geographical context is crucial to the way pupils are segregated across schools, the

choice set element of that context is a significant gap in the research base as it stands. While there is a good deal of qualitative research on the dynamics of choice, there is a need for more qualitative evidence that deals with the constraints and the choice sets available to parents that would start to open up the black box.

That having been said, the consistency of the result of higher levels of segregation across schools in school choice systems, despite differences in system design, geography or duration, is striking. These findings lead us to the following implications for policy. First, school choice is not the policy instrument by which the integration of pupils across schools, by socioeconomic status, ethnicity or faith, can be achieved. Second, local context matters, both in terms of the schools from which parents can choose, and the overall allocation of places across schools in any one locality. Any system of school choice therefore needs to take account of, and be sensitive to, these local variations in the overall allocation of pupils to schools. Third, because the reasons for the observed increases in between-school segregation of pupils are localised and contextual, relating to geographical areas of school choice that are at a greater scale than individual school catchments, the coordination of admissions (including schools that are oversubscribed) should be conducted at an urban municipal / local authority (or equivalent) level, rather than being at the discretion of individual schools.

A compounding factor of school discretion over admissions from the studies included for England in this review is that the evidence suggests that schools being able to select pupils exacerbates between-school segregation in a school choice system. This has implications for example for the current English system and the emphasis on faith schools, free schools and Academies who are their own admissions authorities. A further finding in cases of over-subscribed schools is that even if a lottery, rather than other over-subscription criteria, is employed, the evidence reviewed suggests that segregation of pupils across schools still increases. The literature further suggests that boundary drawing to ensure heterogeneity in lottery allocation may be key.

There are wider issues relevant to policy that follow from the results of our review. As discussed above, exponents of school choice have argued that it can increase equality and educational attainment by breaking the geographical link between pupil and school and by raising the quality of schools via competition for pupils respectively. The results of this review cast doubt on the former, which potentially creates more of an imperative for this policy to achieve the latter. The balance of research evidence suggests, however, that it does not do so: despite the policy rhetoric, the evidence on the extent to which school choice leads to improved educational outcomes for all students is, at best, somewhat mixed (see Wilson 2015; Burgess 2016; Allen and Burgess 2010 for recent reviews of the literature). The two key outcomes of school choice – sorting and attainment – are of course linked, partly through the ways in which the resulting pupil allocations create within-school peer groups and therefore influence peer effects. If peer groups matter, the ways pupils are sorted across schools have implications for educational trajectories and outcomes as well as impacting on more general issues of a lack of social cohesion in a school system in which,

certainly in the UK, social mobility and cohesion have been seen as key elements by successive governments.

Conclusion

Education is considered a key factor in enhancing equality of opportunity, social mobility and social cohesion. This study has been concerned with one aspect of educational equality of opportunity: that of access to schools, and, in particular, choice-based systems as the means of allocating pupils across schools. If we think of increased equality of opportunity as being more integrated patterns of allocation, the evidence reviewed in this study suggests that school choice does not enhance such opportunity. Indeed, choice systems are associated with higher levels of segregation of different types of students across schools. Policymakers cannot, therefore, assume that choice leads to greater equality of opportunity. Furthermore the reasons for increased segregation are highly contextual, and include the mix of schools, socio-demographic patterns and specific choice mechanisms as well as parental preferences. Policymakers need to be sensitive to these contextual issues in the way that pupil allocation mechanisms are designed.

The results of this systematic review provide an overview of the effects of a range of school choice systems on the allocation of pupils to schools. Allocation mechanisms are a vital link between socio-demographic residential patterns and the pupil composition of different types of school in an urban area. These mechanisms have their own impacts on the resulting spatial distribution and social/educational situation of pupils across schools. The introduction of school choice mechanisms can also impact on residential sorting prior to choice. In all this the particular local context is critical: its social geography, the particular policy mix and the institutional and geographical 'space' for the allocation of pupils. This report suggests that a keen attention to these scales and geographies of allocation is critical in understanding the dilemmas and dynamics of choice, the resultant inequalities, and any proposed interventions or solutions to reduce these inequalities.

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Technical Appendix

Table A1: categorization for data extraction

Column heading	Legend / explanation
ID	Unique paper identifier
Theoretical/empirical/both	An indicator of type of study
Country	Country in which the analysis is situated
Location	For example, name of particular city, region
Stage of education	Primary/elementary or secondary/high school
Sample	Sample drawn on for the purpose of the study
Sample size	Number in sample
Pupil/family characteristics – categorization	Socioeconomic status; ethnicity; gender; faith....
Pupil/family characteristics – operationalization	Measures used (for example: family income; parents' education for social class; self-reported ethnicity;)
Quantitative/qualitative/mixed	Indicator of primary research method(s) employed
Research design	For example: survey; interview; statistical analysis of administrative data...
Methodological rigour	H/L – see Table A2 below for quality evaluation criteria
Theoretical consistency	H/L – see Table A3 below for evaluation criteria
Choice system	1/0 (as explained below)
Key elements	Description of key features of choice system being analysed
Choice set	1/0 (as explained below)
Choice dynamics	1/0 (as explained below)

Notes/comments	Any additional relevant information regarding aspects of choice dynamics included in the study
Actual choice	1/0 (as explained below)
Allocation mechanism	1/0 (as explained below)
Allocation of pupils to schools	1/0 (as explained below)
Authors' findings	Summary of key findings of the study
Authors' implications (research; policy)	Summary of key implications of the study, as identified by the authors
Reviewer additional comments	Key elements, findings, other comments

Components of the choice process

Each study was marked 1/0 with reference to the different elements of the choice process as listed below:

1: the study includes information on the element;

0: the study does not include information on the element.

- The choice system (details of the system also included in the matrix)
- The set of schools that the parents are choosing from (their choice set)
- Choice dynamics – preferences over school attributes and other factors (eg information) that inform parental decisions
- Actual choice – the actual choice that parents make (the 'nominated' school)
- Allocation mechanism – the part of the choice system that links the actual choice (nomination) to the school to which the pupil is allocated (eg selection criteria; tie-break devices; lottery...)

Methodological rigour

Studies were not excluded on the basis of any form of *ex ante* quality evaluation. Rather, as in Table A1, all studies in the dataset were marked H or L to indicate their methodological rigour, informed by the criteria in Table A2.

H = study conforms to what is required from examples in the table; L = study doesn't conform

Table A2: methodological rigour / quality evaluation criteria

Study construct	Example
Sample	1 Sampling strategy defined and appropriate 2 Sample size appropriate for methods employed

Study protocol	1 Study procedures systematic and well justified
Measurement	1 Data collection specified and systematic 2 Measures used demonstrate adequate reliability and validity
Attrition	1 Withdrawals, dropouts or other losses from the study identified and accounted for
Threats to validity	1 Confounders and bias considered and controlled
Discussion	1 Conclusions supported by results with possible biases and limitations considered

Theoretical consistency

The review encompassed purely empirical papers as well as purely theoretical papers and empirical papers employing an explicit theoretical framework.⁴ Papers in the latter two categories were marked H or L with reference to Table A3.

H = study conforms to what is required from examples in the table; L = study doesn't conform.

Table A3: theoretical consistency

Theoretical consistency	<p>For purely theoretical papers: degree to which the theoretical approaches used in the paper are consistent; degree to which single theoretical approaches are applied consistently.</p> <p>For empirical papers employing an explicit theoretical framework: degree of consistency between theoretical approach, research design and methods selection; data management and analysis (where reported); and presentation and interpretation of findings.</p>
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⁴ We do not include the purely theoretical papers in the final dataset on which the current systematic review is based, given our specific focus. We do include both purely empirical papers and empirical papers employing an explicit theoretical framework.

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