

## **Explaining School Segregation**

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## Introduction

Our ESRC-funded project investigating the impact of markets in public policy (R000238031) is now officially complete, although as will be shown in this paper we intend to continue work on our existing dataset. We have published and disseminated widely throughout the two years of this project – two books, two chapters, 30 journal articles (in education, sociology, geography, public policy, and methods journals in the UK, USA and Europe), 11 working papers, 20 conference presentations, and numerous newspaper articles, radio and television broadcasts. Many readers will therefore have already come across this project. Our intention here is to present new and tentative findings from the fourth and final phase of this work. In broad summary our work consisted of a descriptive phase based solely on secondary official statistics, an in-depth investigation of the role of LEAs in producing the patterns we uncovered in the first phase, and in-depth investigation of the role of schools (drawing also on our previous work on the role of parents) in the third phase. Our fourth phase was to conduct a multivariate analysis of the possible determinants of the first phase, as explicated by the results of the next two phases – ‘putting it all together’. The project involved consideration of both the social composition of schools and the impact of this on examination results. This paper considers only the first of these (while readers are directed to Gorard and Taylor, 2002a, for the second).

The paper starts with a summary of the project so far which, for brevity, relies heavily upon reference to our already published work (see Gorard et al., 2001, for an overview). We then describe the methods used for our new analysis intended to help answer the question ‘what determines changes in social segregation between schools?’. We illustrate patterns of segregation, and their variation over time and place. We then show how the level of segregation in any place can be predicted with perfect accuracy from a very limited suite of explanatory ‘determinants’, and how the same determinants also predict changes in segregation over time with near perfect accuracy.

In one sense, the purpose of this project was very simple. In 1997 we were present at a dispute concerning the findings of a group of researchers at Kings College (represented by Gewirtz, Ball and Bowe 1995). Their finding was that the process of choosing a new school was undertaken differently by different social classes in England and Wales, and their conclusion was that, therefore, schools would have become more polarised by class after the Education Reform Act 1998 than they were before. This finding was disputed by a researcher from Manchester (represented by Tooley 1997), who presented evidence of inconsistency and inaccuracy in the Kings’ research. The debate seemed rather sterile, given that it was about the meaning of only around 100 interview narratives in a couple of London LEAs. We therefore decided to test, in a much more robust manner, the proposition that schools in England and Wales had become more polarised by class after 1998.

In another sense, even this rather simple test proved unpredictably complex in implementation, especially as we decided to consider also the relationship between the changing composition of schools and their outcomes. The project therefore led us into delightfully sophisticated issues that we had not foreseen, such as, what exactly is ‘social polarisation’ and how can we measure it most efficiently?

Our early work (Gorard and Fitz 1998) used figures for free-school-meal eligibility (FSM) for a very limited number of LEAs from 1989 to 1997, and two measures of between-school segregation - the areal segregation index and the school-based segregation ratio. We found no evidence of an increase in polarisation between school intakes over time, and our conclusions therefore contradicted the findings, as they presented them, of the Kings group and most other UK research (e.g. Willms and Echols, 1992) and much international research on this issue (e.g. Waslander and Thrupp, 1995). Our work was criticised by others, but without publication and therefore peer review of their criticisms, on four main grounds: that it conflated the change from recording takeup of and eligibility for FSM, that it only applied to Wales where the LEAs were based, that our index was flawed in a particular respect, and that we must be wrong since other studies have come to a different conclusion. Since these criticisms were often made verbally at conference, or as referee comments recommending the rejection of our papers, they made our task harder without allowing us the courtesy of a formal right of reply.

For the record:

- The annual school census in Wales, unlike that in England, recorded FSM eligibility for each year we used in our analysis
- Our calculations have been conducted with all schools (primary and secondary) in England and Wales using FSM takeup, FSM eligibility, first language, additional educational need, and ethnic group (for as many years as these have been available). The results show the same picture for each indicator at each level. Social polarisation between schools did not increase from 1989 to 1997 (Gorard and Fitz 2000a, Gorard and Fitz 2000b). It is interesting that the critics did not direct their 'only a local effect' argument at those researchers, including themselves, who worked on an smaller scale (considerably smaller even than our first attempt) in almost exclusively London settings.
- While no index of segregation or polarisation is above criticism, we are confident that our analysis does not have the 'flaws' attributed to it. It is the only analysis of this scale and over this period of time. It uses five different indicators at five different levels of aggregation from school to national. It uses all major indices of segregation/polarisation (including Dissimilarity, Atkinson, Gini, Information, Hakim, Isolation, and Hoover indices). All lead us to the same conclusions. Our preferred index (segregation) has many advantages over the foregoing especially in terms of compositional invariance (Gorard and Taylor 2002b), and our segregation ratio has anyway never been criticised (or even discussed by others). Several of the informal criticisms of our work have anyway been confused about the nature of the index we were using (most commonly confusing it with dissimilarity, or Coleman's index), or have made other unfounded comments (such as that we need to conduct null-hypothesis significance tests when looking at changes over time in our population data).
- All of the 'contrary' studies we have examined show significant defects. The most common is that they simply do not set out to test what we did. As with the original Kings study, they usually examined the process of choice at a very local and small scale (many in inner London only), and hypothesised a growth in polarisation as a result. They usually looked at only one year of entry, and therefore not only lacked a suitable comparator before the impact of choice, they actually lacked any comparator at all, and had no justification for making claims about changes over time (Gorard, Fitz and Taylor 2001). Some studies are simply wrong. Ambler

(1997) used data from the 1940s to test the impact of choice in the 1990s. Waslander and Thrupp (1995) have contradictory data and conclusions, due apparently to misprints in tables that have never been resolved (Gorard 2000). Noden (2000) confuses calculations using our segregation index with the dissimilarity index, and averages figures for each LEA regardless of their number of schools to reach a totally invalid national 'arithmetic mean'.

These challenges, which themselves raise important question about the nature of the current peer review process and its relationship to scientific progress, have slowed our progress in two ways - by not allowing us to cumulate our argument through publication as fast as we would have liked, and by encouraging us to rehearse arguments within educational research that are more mature in other fields, such as occupational sociology. This has had the unintended benefit of widening the scope of the project and allowing us to publish in a wider literature (by both discipline and country) than we originally intended. But however carefully we have dealt with criticisms, and however widely we have disseminated both methods and findings the same group of UK-based researchers continued to object to our work informally and as referees (but they have not, in the main, cited it in their own work, even to dismiss its worth, nor have they published and thus had reviewed themselves, any counterclaims). Having dealt with the four families of objections above we then encountered at least five more over the period of the project. These are that: whatever we have shown there must be polarisation happening at some other level of analysis; whatever happens in general there are an increasing number of schools in spirals of decline; even if what we say is correct we should not publish it; the referee has heard that someone else has objected to our index, and finally in the words of a referee rejecting a paper submitted to the Journal of Education Policy 'while it is not apparent in this paper, there is something wrong with the project from which it springs'.

We have, therefore, also had to deal with these five families of reasons to ignore our findings. For the record:

- The objection that there is another level of aggregation at which a radically different process takes place, was dealt with in our first papers. We cannot analyse segregation between schools at a lower level than the school. We have shown a consistent picture for school, local market, district, LEA, economic region, and home country, chiefly via conducting analyses at all these levels, and through our more general consideration of the modifiable areal unit problem (Taylor et al. 2002).
- Similarly, some commentators have claimed that schools in spirals of decline (losing pupil numbers and therefore funding, and having an increasingly disadvantaged intake) will have increased since 1988 (e.g. Lauder et al. 1999) but none have actually tested this idea. We have. We found it to be false (Taylor et al. 2000).
- We reject entirely the notion, represented by Thrupp (2001), that we should not publish our findings in case they are used by other commentators to advocate greater school choice. Our findings have been used by neo-liberal commentators to try and justify choice schemes, as well as by left-of-centre organisations to defend local comprehensive schools, by Labour MPs to argue against their party's policy on specialist schools, and by humanists to argue against increasing the number of faith-based schools. Our findings have been of considerable interest to local governors and overseas governments alike (as any internet-based search will

attest). Our work is publicly-funded and our responsibility is to disseminate, while making as sure as we can that what we disseminate is rigorous and usable.

- The notion that our work is somehow undermined, despite its testing reviews while gaining the publications listed above, because a referee has heard that some unspecified other person has an objection to it would be totally ludicrous were it not so damaging and so commonly encountered. A similar recent version of this is when a commentator completely dismissed our method, which has a long pedigree within the sociological literature, because they believed that given time they would be able to work out an alternative method (using multi-level modelling) that might give a different result. Our more-reasoned response would be to compare the two or more methods only once they both exist (not before).
- The approach of the JEP referee, and others like them, in dismissing a paper because of its authorship rather than its content, is contemptible.

Perhaps the most solid achievement of this work has been the creation, maintenance and extension of a unique and powerful mixed dataset. This data is hierarchical in structure. At the highest level it contains records for each state-funded school in England and for each school, whether state-funded or fee-paying, in Wales. These records contain school organisation information (such as size, sector, method of entry), local context figures (such as population density), student composition figures (such as gender, language, ethnicity), and school outcomes (such as GCSE results), all for as many years as these have been available (from 1989-2000 for the most complete fields). While the dataset refers to both primary and secondary schools, our emphasis has been on secondary schools. At the next level the dataset consists of records for each of 41 LEAs in England and Wales, selected as a sub-set to represent the variation we encountered in our analysis at the first level. Each record consists of context figures about the LEA (see above), their published school allocation criteria, and transcripts of interviews with one or more LEA officers involved with the school admissions process. At the next level the dataset consists of records for 31 schools within these LEAs, including transcripts of interviews with one or officers involved with the school admissions process

## **Early findings**

Using this dataset our research has provided the largest and most comprehensive analysis of the changing nature of secondary school intakes from 1989 to 2000 in England and Wales. The first year of this dataset represents the last year of school admissions before the beginning of the 1988 Education Reform Act and the nationwide introduction of open enrolment.

Employing a range of measures of segregation the research began by measuring the degree of segregation between schools of students with particular socio-economic and ethnic characteristics (Gorard and Fitz 2000a and 2000b). So, for example, we identified the proportion of children identified as taking and being eligible for free school meals that would need to move schools in order for there to be an equal distribution of such children, relative to the sizes of the schools. This proportion, otherwise known as the segregation index, was calculated for every year between 1989 and 2000 (where complete data was available).

The findings for England and Wales were, perhaps, surprising. A number of key studies during the first half of the 1990s examining the process of school choice by middle-class families and working-class families hypothesised that schools would become increasingly segregated over time as a consequence of removing the responsibility of allocating school places from the local education authorities to parents and schools (see for example, Willms and Echols 1992; Gewirtz et al. 1995; Reay and Ball, 1997). However, the analysis of all secondary school-age pupils and all secondary schools in England and Wales revealed a different pattern (see Gorard et al. 2001). Rather than increasing segregation between schools analysis of the data suggested that, particularly between 1989 and 1995, the proportion of minority pupils required to move schools for equal distribution across the two home nations actually fell. In England the period between 1995 and 1997 is significant as the fall in segregation levelled off during this time. Between 1997 and 2000 the overall level of segregation across England has begun to rise, still below the 1989 level.

In Wales a slightly different pattern of national segregation has emerged. Not only is the level of segregation significantly lower in Wales than in England, but the rate of change over the same period is also much smaller, and has continued to decline to the end of the 1990s. Similar trends, using different datasets and methods of analysis be it noted, have emerged from Scotland (Paterson 2001). These differences between the home nations and the variation of trends over time in England would suggest that there are many factors affecting between school segregation. These cannot be simply, some might say naively, attributed to the introduction of choice and competition in the state-funded education system.

Hence, having identified these patterns of segregation in the first, exploratory phase we were led to consider the more complex investigation of their determinants. We have studied changes in the levels of segregation, and their potential local and national explanations, including parental choice, in detail. This paper presents our most recent analysis, beginning to draw together all of the results. We are now in a position to be able to predict/explain, with some confidence, the levels of segregation across England and Wales, and this is significant move forward in the debate. The benefits of this are two-fold. It is difficult to provide any evidence that parental choice has not led to increasing, *or* decreasing, segregation between schools due to the nature of the data that would be required. However, by accounting for other factors that may determine overall and changing levels of segregation it is possible to estimate the degree to which the process of school choice leads to social division. We can also begin to explain what properties within society and the education system are exacerbating, and limiting, socio-economic segregation between schools. This is useful for policy-makers, particularly those seeking ways of providing access to education, in whatever form, that is fair and equitable.

In trying to identify what underlies the trend in between-school segregation this paper focuses on the LEA as a unit of analysis. We have already written about the choice of unit for examining levels of segregation, such as by economic region and identifiable competition spaces. However, the most convenient and inclusive level of analysis found in England was the LEA (Taylor et al. 2002).

In 1989 there was already a high level of segregation in the schools of England and Wales. There was also significant variation in the levels of segregation between

LEAs, and this variation largely continues to 2000. Attempting to understand why such variations exist, even before the purported effects of open enrolment could be established, will highlight the other factors that determine divisions between schools. This provides the local context in which open enrolment was introduced. Repeating this exercise for levels of segregation in later years would then begin to show if the impact of these factors has changed, and if other explanations for levels of segregation need to be pursued.

## **Methods**

Perhaps the most solid achievement of this work has been the creation, maintenance and extension of a unique and powerful mixed dataset. This data is hierarchical in structure. At the highest level it contains records for each state-funded school in England and for each school, whether state-funded or fee-paying, in Wales. These records contain school organisation information (such as size, sector, method of entry), local context figures (such as population density), student composition figures (such as gender, language, ethnicity), and school outcomes (such as GCSE results), all for as many years as these have been available (from 1989-2001 for the most complete fields). While the dataset refers to both primary and secondary schools, our emphasis has been on secondary schools. At the next level the dataset consists of records for each of 41 LEAs in England and Wales, selected as a sub-set to represent the variation we encountered in our analysis at the first level. Each record consists of context figures about the LEA (see above), their published school allocation criteria, and transcripts of interviews with one or more LEA officers involved with the school admissions process. At the next level the dataset consists of records for 31 schools within these LEAs, including transcripts of interviews with one or officers involved with the school admissions process

The measure of segregation that we use here is the segregation index, an area-based figure that reflects the proportion of a particular minority group that would have to exchange schools for there to be an equal distribution of the minority group between all schools, relative to their size, in the given area. We have considered quite extensively the use of this measure along with other commonly used indicators of segregation (see Gorard and Taylor, 2002b). In brief, this measure has been chosen since it is strongly compositional invariant. Changes in the levels of segregation are not artificially affected by changes in the overall size of the minority group, such as occurs in England when records change from take-up to eligibility for free school meals (Taylor et al., 2001).

Although we have considered a variety of minority groups during this study the segregation that we discuss in this paper is between free school meal pupils and others. This is used as a proxy for socio-economic status, largely due to the lack of alternative figures on such a scale and over such a period of time. This forms our dependent variable(s). Our potential independent variables includes figures for the following educational and background themes (those marked with asterisk were not used in the models here):

Education characteristics:

- Number and size of secondary schools

- Types of schools (by control, such as County, VA and GM; and by type, such as grammar and comprehensive)
- Funding
- Examination performance data\*
- Admission appeals
- Absences
- Exclusions\*
- University applicants\*
- Fee-paying sector
- Surplus places
- Special educational needs

Background characteristics:

- Population density
- Unemployment rates
- LEA political control
- Residential segregation
- Ethnicity
- English as an additional or second language

Since we are examining levels of segregation since 1989 we have tried to obtain this data over as long a period of time as possible. For variables that we generated from our school-level database this was generally straightforward. However for many variables this was more difficult - changes in what was collected by central government, changes in the definition of the variables (for example, from 'English as a *second* language' to 'English as an *additional* language'), changes in policy (such as the funding formulas), the lack of repeated data (such as unemployment figures by enumeration districts from the UK Census, used to calculate residential segregation), the availability of data over such a relatively long period of time (such as the number of elected councillors by political party for each local authority), and changes in the structure of local government.

This last factor is significant for the analysis, as the geography of local government has changed considerably and gradually during the 1990s. This has meant that between 1995 and 2000 every published piece of data was based on a different set of LEAs. In order to overcome this data has been re-aggregated, where possible, to what we have termed 'old' LEAs and 'new' LEAs. The 'old' LEAs are those that existed prior to local government reorganisation, characterised by Metropolitan Boroughs and Counties, the latter based on a three-tier system of governance. The 'new' LEAs are those that now exist, post-local government reorganisation. The key difference is the creation of unitary authorities and the reduction in size of the former County LEAs. This has meant that number of LEAs in England has increased from just over 100 to 150, and in Wales from 8 to 22. In some cases re-aggregating the data is impossible, i.e. there are no raw figures, or these are otherwise meaningless, such as the average spending per pupil by the LEA. Consequently we have undertaken our regression analysis for both sets of LEAs, 'old' and 'new' in succession.

For a sample of LEAs, 74 out of 149 current LEAs used in the analysis (one LEA has no secondary schools), we have identified the admission arrangements used by the

local authority. In particular we have identified the importance of six key factors used by LEAs (see White et al. 2001). Four of these relate to the combination and priority of criteria used in cases where schools are oversubscribed: the use of catchment areas, sibling criteria, feeder schools, and proximity (i.e. a variable distance between school and parents' homes). These four criteria are the most used when prioritising children to school places. Which criteria are employed, and in which order they are applied, varies between LEAs. Since admissions to schools are, in the main, finite in size and have to operate to published admission numbers these criteria can often play a significant role in determining whether segregation between schools will take place.

One of the other two admission factors distinguish those LEAs where the authority plays a minimal role in school admissions; instead the schools administer their own admissions, an application form is required for each schools, and schools set their over-subscription criteria entirely independent from each other. Examples of this can be found in LEAs where during the mid-1990s more than three-quarters of the secondary schools 'opted-out' of LEA control and became Grant Maintained status. Under previous legislation the Funding Agency for Schools (FAS) became responsible for the provision of school places, including the admission arrangements. In the case of the latter the FAS handed the responsibility of such matters to the schools themselves, whether they had become GM status or not.

The final admissions factor incorporated into this analysis is for LEAs that employ banding in their admission arrangements. Clearly the use of test results in allocating school places will affect the socio-economic balance of the intakes. Therefore, the analysis needs to at least identify those LEAs where this may alter the effect of other forms of admission arrangements. Our background data also contains figures on grammar schools (and specialist schools), and is therefore able to distinguish between selective and non-selective LEAs.

Although admission arrangements are an important, and previously unused, set of variables, there is a limitation in their use. Unfortunately not all schools within an LEA have to employ the same arrangements and criteria as what the authority states. Currently, for example, voluntary aided and grant maintained schools are allowed to set their own oversubscription criteria, possibly deviating from the stated LEA policies. Similarly, these variables overlook the fact that some schools can select a proportion of their intakes on academic ability and aptitude in particular subjects. The variation in admission arrangements within LEAs is a key missing factor, and one that would be incorporated with multi-level modelling and further empirical work. However, for this paper it is hoped that being able to identify the *likelihood* that there is variation within the LEA over admission arrangements, such as the presence of voluntary aided, grant maintained, specialist and grammar schools, will suffice.

In trying to explain patterns of segregation, we have focussed on three years of segregation figures: 1989, to mark the beginning of the period under analysis; 1996, a year when national levels of segregation plateaued out before changing direction; and 2000, the most recent figures we have. In terms of changes in segregation, then, there are three periods of time: 1989 to 2000, overall levels of change for the whole period; 1989 to 1996, the first period of change, characterised nationally by a fall in segregation; and 1996 to 2000, the last period change, characterised nationally by a

small increase in segregation. It is to the patterns of segregation for these three periods that the paper now turns.

### **Patterns of Segregation**

Although the overall level of socio-economic segregation in England and Wales has declined since 1989 there is significant variation within the two home nations. Such variation existed before open enrolment (Figure 1). Although not a complete picture as only data for England is fully available, the complexity in levels of between-school segregation are clearly seen. Milton Keynes and Solihull head the most segregated LEAs at the beginning of the period, closely followed by Buckinghamshire, Oxfordshire, Sutton, Portsmouth, Trafford and Kent<sup>1</sup>. At the other end, areas with the least segregation were Thurrock and Thameside (formerly part of Essex), Barking and Dagenham, Islington, Blackpool and Hackney. It is important to note that urban and metropolitan LEAs feature as both very high and very low segregated areas. However, there were very few County LEAs with low levels of segregation in that year. The exceptions tended to be in the most remote areas of England: Cornwall and Devon, Herefordshire, Derbyshire, and Durham.

By 1996 the pattern of segregation looked very different (Figure 2). There were fewer LEAs at the extreme ends of high and low segregation, indicating that segregation levels across LEAs had homogenised. Buckinghamshire was now the most segregated LEA, followed still by Solihull. Three outer London Boroughs, all to the south, had become relatively more segregated than other LEAs in the country: Sutton, Bromley and Havering. Knowsley had become the least segregated LEA along with the London Boroughs of Southwark, Islington, Barking and Dagenham, Lewisham and Tower Hamlets. Figure 2 also shows the generally lower levels of segregation in Wales.

Patterns of segregation in 2000 were little clearer. Inner London continued to have low levels of segregation while the outer London Boroughs remained relatively high. Large urban areas of south Wales and the south coast of England were relatively highly segregated compared to their neighbouring, more rural, local authorities. The Counties surrounding London and those along the commuter belts of the M4, M40 and M1 were also relatively high. Towards the north of England the large counties of Lincolnshire, North Yorkshire, Cumbria and Northumberland had relatively high levels of segregation. But urban areas outside London were more mixed, some with very low levels of segregation, such as Manchester, Oldham and Knowsley.

These figures illustrate the variation in the levels of segregation across England and Wales, although the general patterns in 1996 and 2000 do not appear too dissimilar to that presented for 1989. However, to see the effects of time upon segregation it is necessary to focus on the proportional change in segregation levels between those three years. Figure 4 illustrates the overall rates of change in segregation levels between 1989 and 2000. Over this period segregation increased substantially in five LEAs: Kensington and Chelsea, Derby City, Torbay, Poole and Thurrock. Four of these are 'new' authorities and the result could be related to the school reorganisation that would have occurred with local government reorganisation. Other areas of England that saw an increase in segregation over these eleven years were Essex, Durham, Derbyshire, Telford and Wrekin, Bournemouth, Peterborough and Stoke.

However, any segregation that occurred in these LEAs was offset by desegregation between schools in areas such as Southwark, Islington, Tower Hamlets, Brent, Windsor and Maidenhead, Bracknell Forest, Wokingham, West Berkshire, Swindon, Milton Keynes, Leicestershire, City of Nottingham, Stockport, Knowsley and Doncaster. Indeed, segregation in the vast majority of LEAs remained constant or fell over this period.

As we discussed in the introduction, there appears to have been two phases, the first of desegregation between 1989 and 1996 and then the more recent phase of increasing segregation between 1996 and 2000. It is worthwhile, therefore, to examine the rates of change for these two periods separately. Figure 5 illustrates the change in segregation for the first phase, 1989 and 1996. Clearly the same LEAs that became increasingly segregated over the whole period, 1989 to 2000, did so during the first half of the 1990s. Similarly, those that desegregated over the entire period were largely the same LEAs that desegregated between 1989 and 1996. Consider this against the patterns of segregation change over the last five years (Figure 6). In the latter period under study a very different pattern of change has emerged. LEAs such as Southwark, Wandsworth, Westminster, Bath and North East Somerset, Peterborough, Manchester, Brighton and Hove, Torfaen and Blaenau Gwent have become significantly more segregated. These are closely followed by an even more unlikely set of LEAs such as Cornwall, East Sussex, the west coast of Wales, South Gloucestershire, Wiltshire, Hertfordshire, Trafford, Rotherham and Wigan.

It would appear from comparing Figures 5 and 6 that the two phases in national segregation are being driven by changes in segregation by two *different* sets of LEAs. This may suggest that the factors underlying these changes are different for the two time periods. This conclusion raises an important methodological problem of relating patterns of change to policy decisions over time. It may have not gone unnoticed that the change in direction for school segregation occurred around the time of new school admissions legislation. The 1998 School Standards and Framework Act introduced a new code of practice in the organisation of school admissions, giving increased power and responsibility to LEAs during this process (White et al. 1999). However, this also came about at a time of increasing levels of employment in the UK, a factor that has already been identified elsewhere for its impact on overall levels of segregation.

In order to address this problem and to begin to identify the underlying causes for segregation between schools in England and Wales empirical analysis can follow two routes. First, we can begin to examine in detail particular LEAs and the unique circumstances that are leading to increasing or decreasing segregation (see Fitz et al 2002 for four such case studies). The alternative route is to study these variations in more depth and attempt to distinguish the individual factors, or combination of factors, that may explain these differences. Combining both of these approaches not only helps to triangulate the evidence but also complements their development. We have already begun to report our findings from the more detailed examination of a sample of LEAs. The following section attempts to build on this, where possible, by following the second route of enquiry and developing models of explanation for between-school segregation for all LEAs in England.

## **Explaining levels of school segregation**

The levels of segregation between schools for all three years, 1989, 1996 and 2000, could all be predicted from the available contextual characteristics. In other words, with the absence of output-type variables, such as appeals, examination performances and unauthorised absences, it was possible to explain all of the variation in segregation between the 149 LEAs in England ( $R = 1.00$ ;  $R^2 = 1.00$ ).

One of the key determinants (with significant coefficients, retained by backward selection, and the first used in forward selection) is population density. As we have seen, areas with high population density, such as in inner London, generally had relatively lower levels of segregation. However, as Figures 1, 2 and 3 illustrate, not all urban areas have low levels of segregation, and not all rural areas have high levels of segregation. There are other factors in play, perhaps in interaction here. Also, what is not clear from this is how the high population density affects segregation (if indeed it does). One view may be that in urban areas there is less physical space between middle-class and working-class residential areas. Since families living in urban areas, particularly in London, are characterised by their 'cheek-by-jowl' existence, there is a greater likelihood that they will attend similar state schools (especially where proximity criteria are used in allocation). This would contrast quite significantly with the physical divide in county shires between families living in large urban council estates and families living in more affluent suburban areas. On the other hand, it could be that there is greater school choice for parents, with fewer problems of access to a greater number of schools than in remote rural areas of England. Therefore, parents from all socio-economic backgrounds have access to an alternative school other than their nearest. This may help ensure that school intakes are more socially mixed. As indicated in the introduction it is always going to be difficult to relate parental choice directly to the outcomes of segregation and desegregation (but see below). However, these two alternative views are similar in that they are both a product of space and geography.

Another key determinant is the level of residential segregation in each LEA. We calculated residential segregation using the segregation index with the number of unemployed residents living in each Enumeration District from the 1991 UK Census (see Taylor and Gorard, 2002, for a discussion of this method). This is a factor that we have identified before as being significant in accounting for variations in LEA segregation (Taylor and Gorard 2002). We do not wish to repeat the discussion here, but since school intakes are largely constructed from populations surrounding the schools, the greater the levels of residential segregation the greater likelihood that local schools will also be highly segregated.

Two further factors that are important in the resulting regression models are the overall levels of poverty (i.e. the absolute proportion of children eligible for free school meals) and levels of unemployment in each LEA. Again, we have reported the potential importance of these factors elsewhere (Gorard and Fitz 2000a and 2000b). The greater the level of poverty the less socio-economic segregation between schools there tends to be. Note that this is an empirical finding, not a compositional effect which might occur with other indices but would anyway work in the opposite direction – e.g. high levels of poverty related to high levels of segregation using dissimilarity. Instead this finding is related to the point made above regarding the

geography of residential areas. In essence, areas with a sizeable proportion of residents living in poverty are more likely to be evenly distributed than in areas where only a small proportion of the population is living in poverty. As overall levels of poverty rise the population in poverty are likely to be more evenly distributed. Conversely, as overall levels of poverty fall the population 'left' in poverty are likely to be more concentrated in space. Since school intakes are by and large a product of their residential locales the same would apply to school segregation when overall levels of poverty rise and fall.

Another factor related to levels of socio-economic segregation in schools is the degree of ethnic diversity in each LEA. Both, figures for the ethnic composition of children attending schools and the proportion for whom English is an additional language suggest that LEAs with greater diversity are likely to have relatively lower levels of socio-economic segregation. Although this will be related to the overall levels of poverty and the population density discussed above, it still accounts for some of the further variation in segregation.

The types of schools in each LEA also have a bearing upon the levels of segregation. Using the indicators that we have two features can be highlighted. First, the greater the levels of school diversity, i.e. the variety of voluntary aided, grant maintained, voluntary controlled, and community schools, the greater the possibility that LEAs will have relatively high levels of segregation. The second feature of school types is the presence of schools that select their intake based on academic ability and aptitude. The latter feature may be of no surprise but the first may need a little more explanation. It should be noted, in the first instance, that there might be some overlap with schools that select their intakes. For example, many grammar schools became grant-maintained in the fear that local authorities may prevent them from using selection in their admissions. Also, many of the current specialist schools are foundation or voluntary aided schools, and this new status gives schools the further possibility to use some form of selection in their admissions (Gorard and Taylor 2001). Although it has been identified that these are small in number they nonetheless overlap. Where this overlap cannot explain the variation in segregation then it is possible to point towards the opportunity that voluntary aided and current foundation schools can make their own admission arrangements. For example, the criteria that they employ if they are oversubscribed could differ from that stated by the LEA, giving them the opportunity, it is argued, to use criteria that may disadvantage those from less advantaged backgrounds. Having investigated this claim in detail through our interviews it is possible to see how this can be done. However, such 'strategies' are not likely to make a significant difference to the intake characteristics of the schools. Where this would make a difference is in areas with denominational schools. Not only are these schools more likely to attract pupils from socially 'advantaged' backgrounds, the way they ask parents to express their commitment to the relevant faith provides a good opportunity to 'weed out' pupils from families with little interest in the schooling of their child, often those living in greatest poverty.

The last factor that has a role in explaining the variation in segregation levels across a sample of LEAs in England is the admission arrangements employed by the LEA<sup>3</sup>. The result of including these variables suggests that LEAs that use catchment or designated areas in giving priority to some children when schools are oversubscribed are likely to have relatively high levels of segregation (see also Gorard et al. 2002).

Interestingly those LEAs that do not operate such areas had relatively low levels of segregation. Conversely, the few LEAs that operate banding procedures when allocating school places were more likely to have markedly low levels of segregation between schools.

Although the results of these admission arrangements may be of considerable importance to policy-makers it is worth noting that even without these variables nearly all the variation in levels of segregation across all LEAs in England can be accounted for ( $R = 0.99$ ;  $R^2 = 0.98$ ). So in a time-order model, where admissions and appeals are the last part of the jigsaw, they appear to make little difference to segregation levels.

These key variables, population density, residential segregation, poverty, ethnic diversity, school diversity, school selection and admissions arrangements, all help to explain all the variation between levels of segregation across LEAs. It would appear that there is little room for the process of parental choice to have any impact. In order to see if this is the case it is necessary to examine the variation between LEAs in the extent to which levels of segregation have changed over time.

### **Explaining change in school segregation**

Changes in levels of segregation over time are much smaller, showing less variation, than absolute levels. It is worth making this rather obvious point to allay the fears of those that believe changes in educational policy lead to large and almost instantaneous changes in all LEAs. By and large the level of segregation in each LEA is determined by residential patterns, and school organisation. Only where these have changed significantly is segregation in schools likely to change, whatever policy of school allocation is in force. Our analysis of changes in segregation for the three time intervals, 1989 to 2000, 1989 to 1996, and 1996 to 2000, reveals similar findings. The predictive models are not quite as accurate as they were for predicting levels of segregation but are, nonetheless, very effective considering the lack of LEA data over the full period for some variables ( $R = 0.945$ ;  $R^2 = 0.893$ )<sup>4</sup>. Again, the variables that help explain the patterns of change in segregation are the same contextual factors that were identified when predicting levels of segregation in LEAs. However, in this model it is chiefly the change in the level of these variables (i.e. increase or decrease in residential segregation) that is significant.

The findings from this analysis allow us to construct a tentative model of the determinants of change. There are three elements to this model, in order of priority:

1. Geography
2. School organisation
3. School admissions

The first set of factors that helps explain changing levels of segregation relate to the geography of the LEAs. In particular, levels of residential segregation and population density are very important background variables in predicting patterns of change in segregation. The model suggests that these factors act like constants, that is, they are very important in determining the levels of segregation but less important in

predicting change. However, their importance to the model simply acknowledges the importance of what level of segregation exists at the start of the period under analysis. Even though the rates of change in segregation are proportionate it is important to note the levels of segregation preceding the introduction of open enrolment. One other 'geographical' factor *is* important in determining the rates of change in segregation – the levels of poverty and unemployment. The discussion earlier outlined how changes in the levels of poverty would impact differentially upon schools. Increasing poverty is likely to lead to lower levels of segregation, while decreasing levels of poverty within society is more likely to leave those living in poverty in particular schools.

The second set of factors relate to school organisation in each LEA. One of the key variables is the change in the number of schools in an area. This is closely related to another variable that is affected by school reorganisation – surplus places. The model suggests that the number of surplus places and changes to the number of available school places are closely related to the rates of change in between-school segregation. We have identified the potential importance of these factors elsewhere (Gorard and Fitz 2000b), but it is worth repeating here. The level of socio-economic segregation between schools tends to fall when LEAs rationalise their education provision. Since LEAs have been able to close struggling schools then their intakes, typically comprised of children living in poverty, are notionally allocated to alternative schools. This means that even without parents themselves making alternative arrangements by closing schools they have to send their children elsewhere. This movement of pupils redistributes those living in poverty to a number of alternative schools, indirectly reducing the levels of segregation between schools. Similar comments apply to surplus places. Areas with few surplus places tend to be less segregated, while presumably the existence of surplus gives the system the 'room' for segregation (perhaps through choice) to occur.

Another feature of school organisation that affects the rate of change is the diversity of school types in the LEAs. Greater diversity and the presence of fee-paying schools are closely related to increasingly segregated LEAs. As discussed earlier this may be related to their admission arrangements, such as the use of selection and the ability of some parents to express their commitment to a particular religion. Diversity drives segregation by giving people a reason other than perceived quality, rightly or wrongly, to use a school other than their nearest.

The final set of determinants of change, and the last (in sequence) to play a role in the distribution of pupils to schools, relate to the admission arrangements employed by the LEAs. As discussed earlier, LEAs that use catchment or designated areas tend to have greater levels of segregation and are likely to see increases in the level of segregation over time. The importance of this can only be realised in instances where schools are oversubscribed. As highlighted above, LEAs have reduced the number of surplus places considerably over the last ten years through a programme of school reorganisation and rationalisation alongside a population bulge in the number of children of secondary school age. This means that schools are increasingly more likely to become oversubscribed. Consequently, the use of particular oversubscription criteria, such as religious commitment discussed in the last set of factors, and catchment or designated areas has increased. It would appear that the use of this latter criterion reinforces the pre-existing levels of residential segregation, identified throughout this paper as a key determinant in the levels of segregation between

schools. Again it seems obvious but bears repeating, oversubscription criteria are only relevant where there is oversubscription. Many LEAs do not have any, and so there criteria and their appeals processes are untested.

## **Discussion**

The new work described here is ‘in progress’. The regression models, even though very effective, are still at an early stage of development. For example we have yet to explore the use of other levels of data, such as school-level data and economic region-level data. However, the components highlighted in this paper that help explain segregation have all been carefully explored in greater detail elsewhere. We see this analysis complementing our other work, in particular developing our understanding of case study LEAs. In effect we are drawing together our understanding of these variables to see how they can help predict levels of and change in segregation across the entire country.

This analysis has already been able to account for all the variation in levels of socio-economic segregation between schools in England. Similarly, it has also been able to account for nearly all the variation in the rates of change in segregation across LEAs. Indeed the key variables identified earlier can be used to predict in which direction segregation has changed from 1989 to 2000 for every single LEA. In other words with a few contextual variables we could say with almost complete certainty whether schools in an LEA are likely to have become increasingly more segregated or less so. It may be of some surprise that this can be achieved even without knowing anything about the nature of parental choice and competition at the local level. This is not to say that the local education market and the way parents choose schools do not play a part in determining levels of segregation. For example, we mentioned early on in this paper that population density may have a bearing upon the amount of school choice parents have. However, the likely impact that choice alone has appears to be negligible in predicting levels of segregation at the LEA level.

Structural factors that exist, whether open enrolment was introduced or not, are dominant in determining levels of segregation and change over time. Some of these structural factors are outside the education arena and are controlled by changes to the national and local economy, the housing market and residential development. Within the education system there are a number of other secondary factors that determine levels of segregation between schools. These include the provision of school places and the form of schooling provided. This analysis suggests it is only after all these factors have contributed to the unequal distribution of children living in poverty to schools that the way in which school places are allocated has any effect. Even then these third-level factors suggest that a return to catchment areas, based on residence, may actually lead to further socio-economic segregation in schools.

We are now moving some way to understanding the impact, or perhaps lack of impact, of the introduction of open enrolment to the education system in England and Wales. However, as we identified at the beginning it would be incredibly difficult to say with great accuracy that open enrolment, giving parents the opportunity to choose the school for their child, actually increases or decreases segregation.

Given this limitation we can continue to measure segregation between schools and relate these patterns of change to more identifiable and measurable contextual characteristics. It is, however, becoming apparent that the debate over the impact of the introduction of market principles to education may be distracting researchers and policy-makers from the real causes of unequal access and opportunities in education.

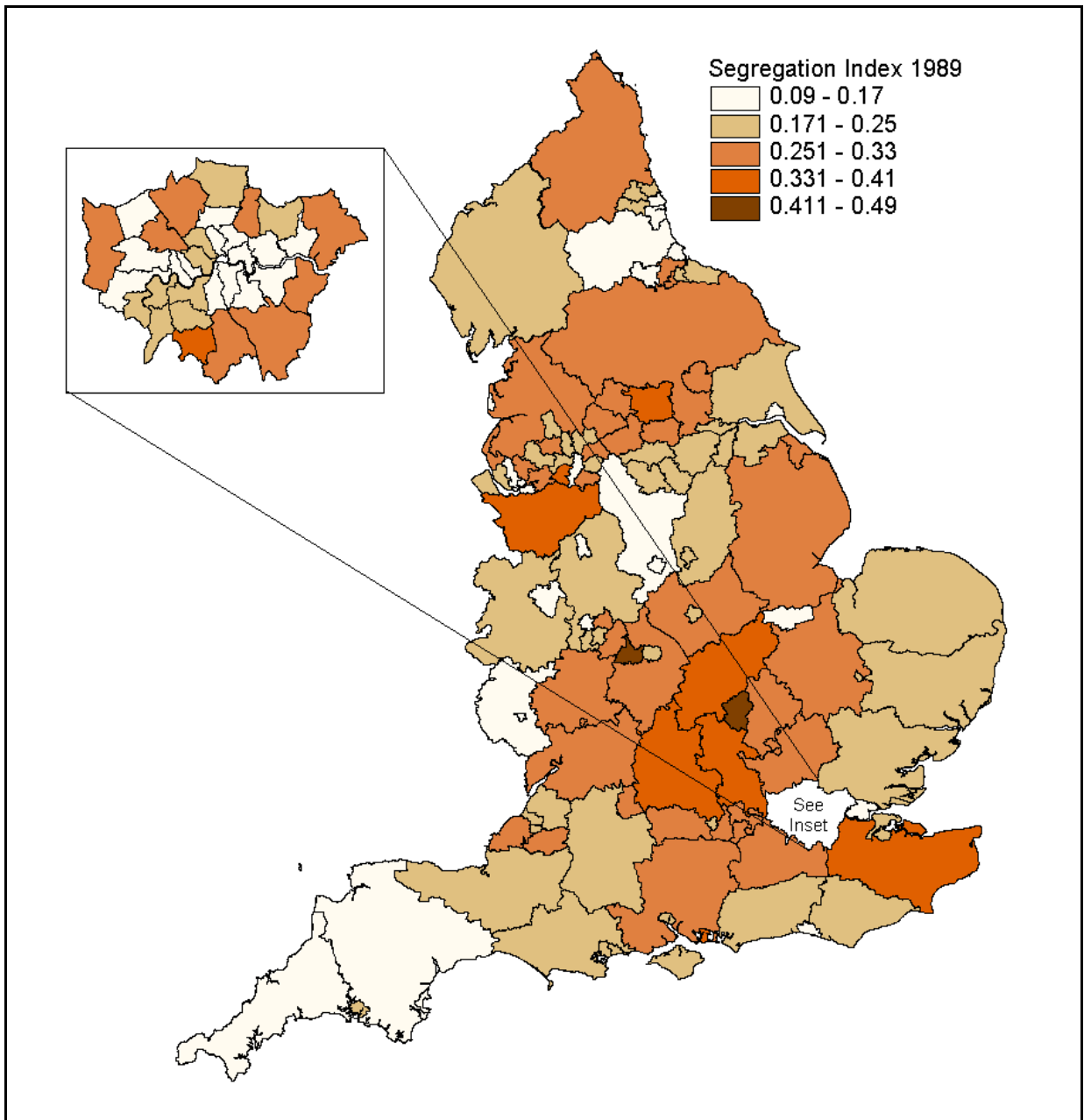
## Notes

- 1 The figures presented here are for 'new' LEAs. The discerning reader will note that, for example, Milton Keynes as an LEA did not exist in 1989. As discussed in the methods section the figures were re-aggregated to the new local authorities.
- 2 The majority of these are now foundation or voluntary aided. However they are still responsible for their own admissions.
- 3 This is only for the sample of LEAs where data on the admission arrangements had been collected.
- 4 These scores are based on the prediction for changes in segregation of the 'old' LEAs. Similar results are obtained for the 'new' LEAs.

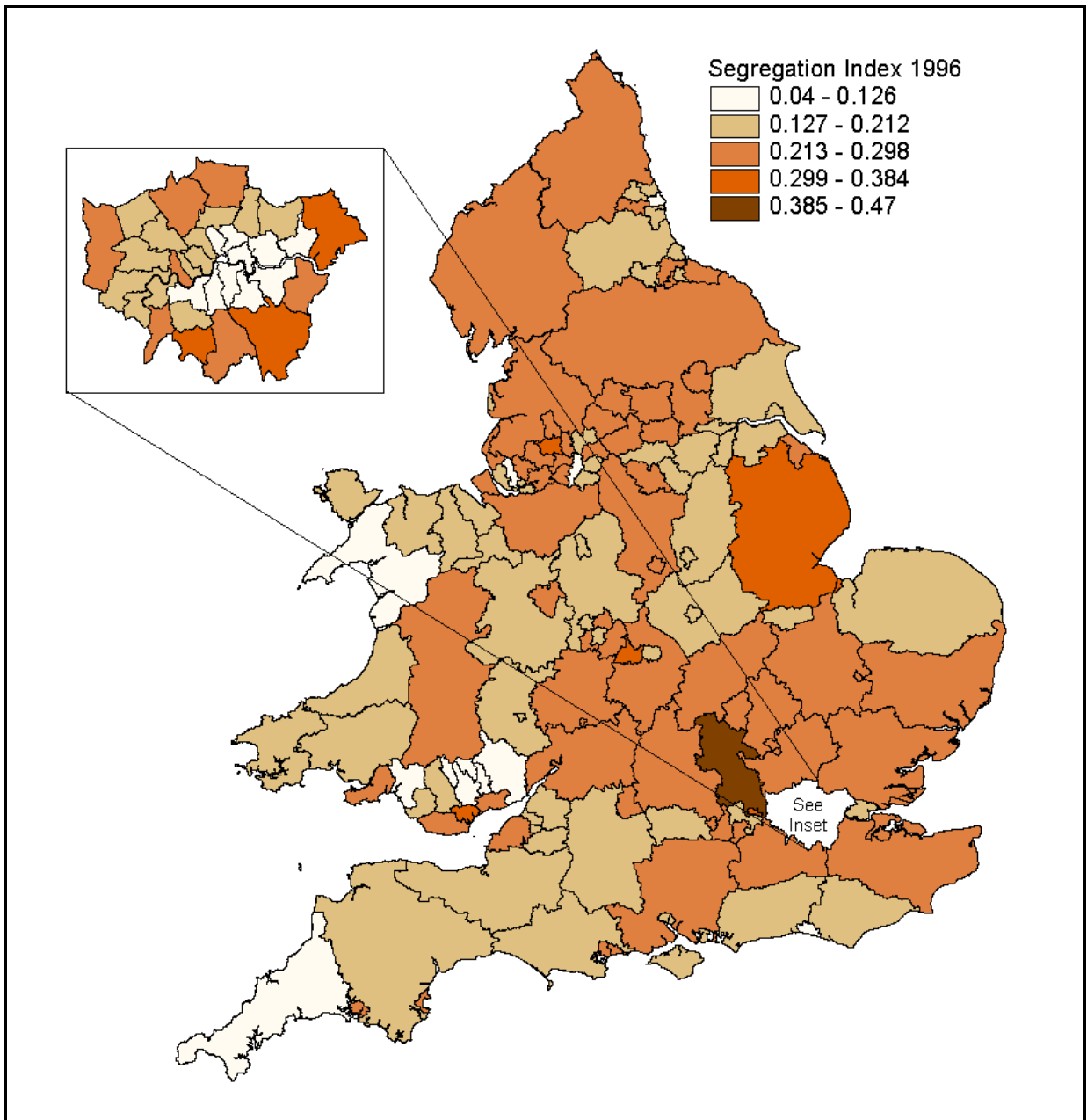
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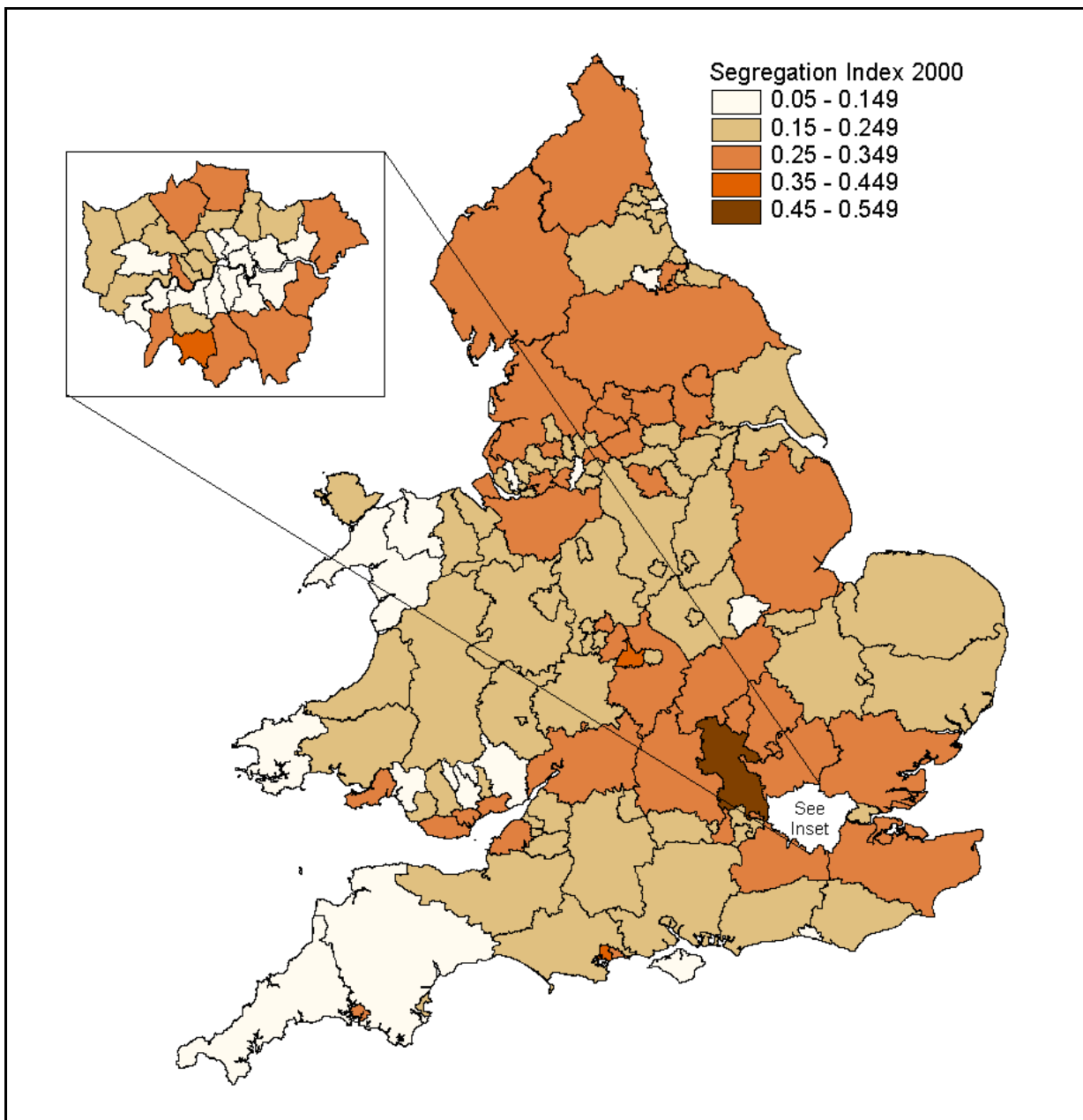
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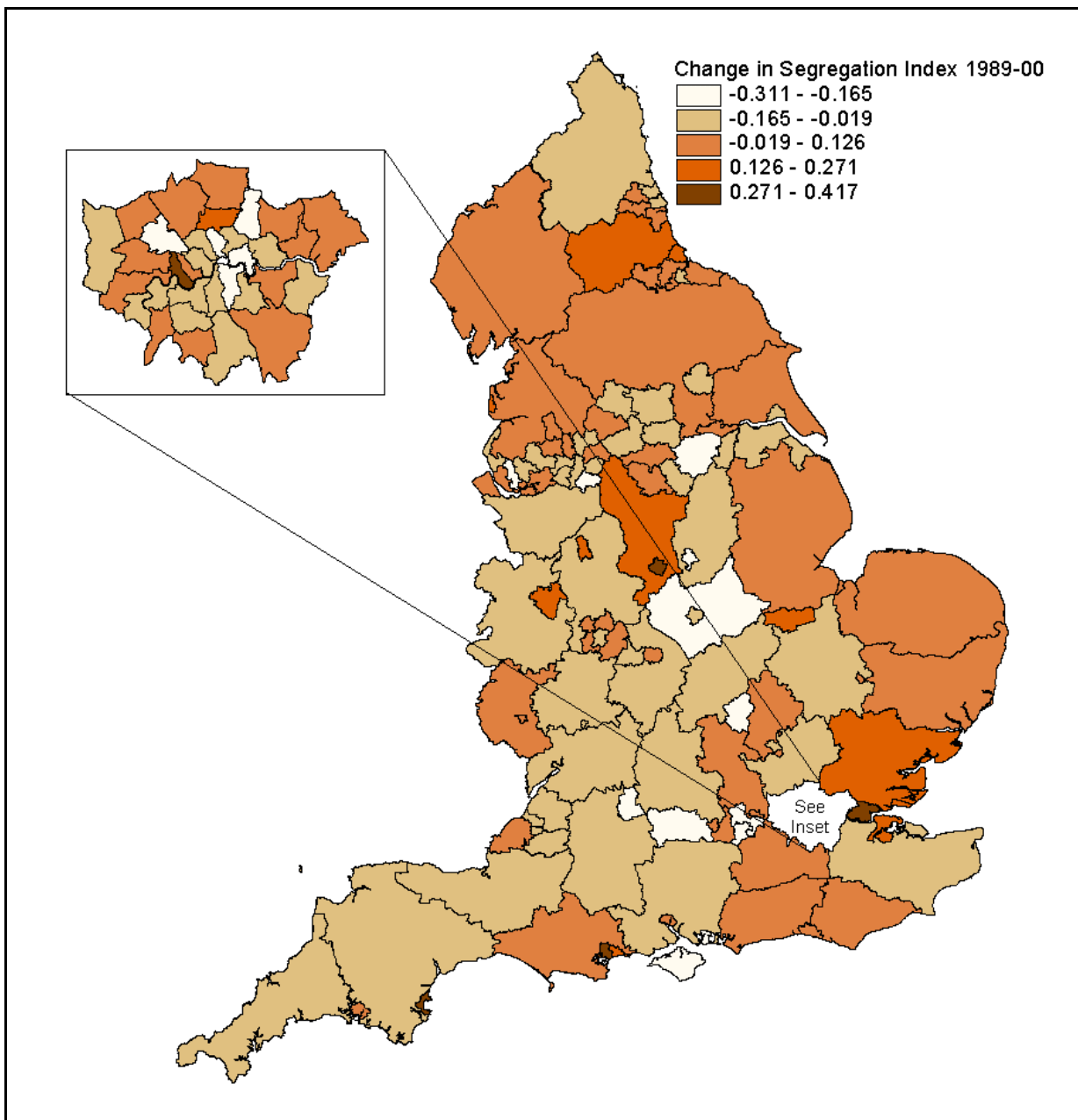
**Figure 1. Socio-economic segregation between secondary schools by LEA, 1989**



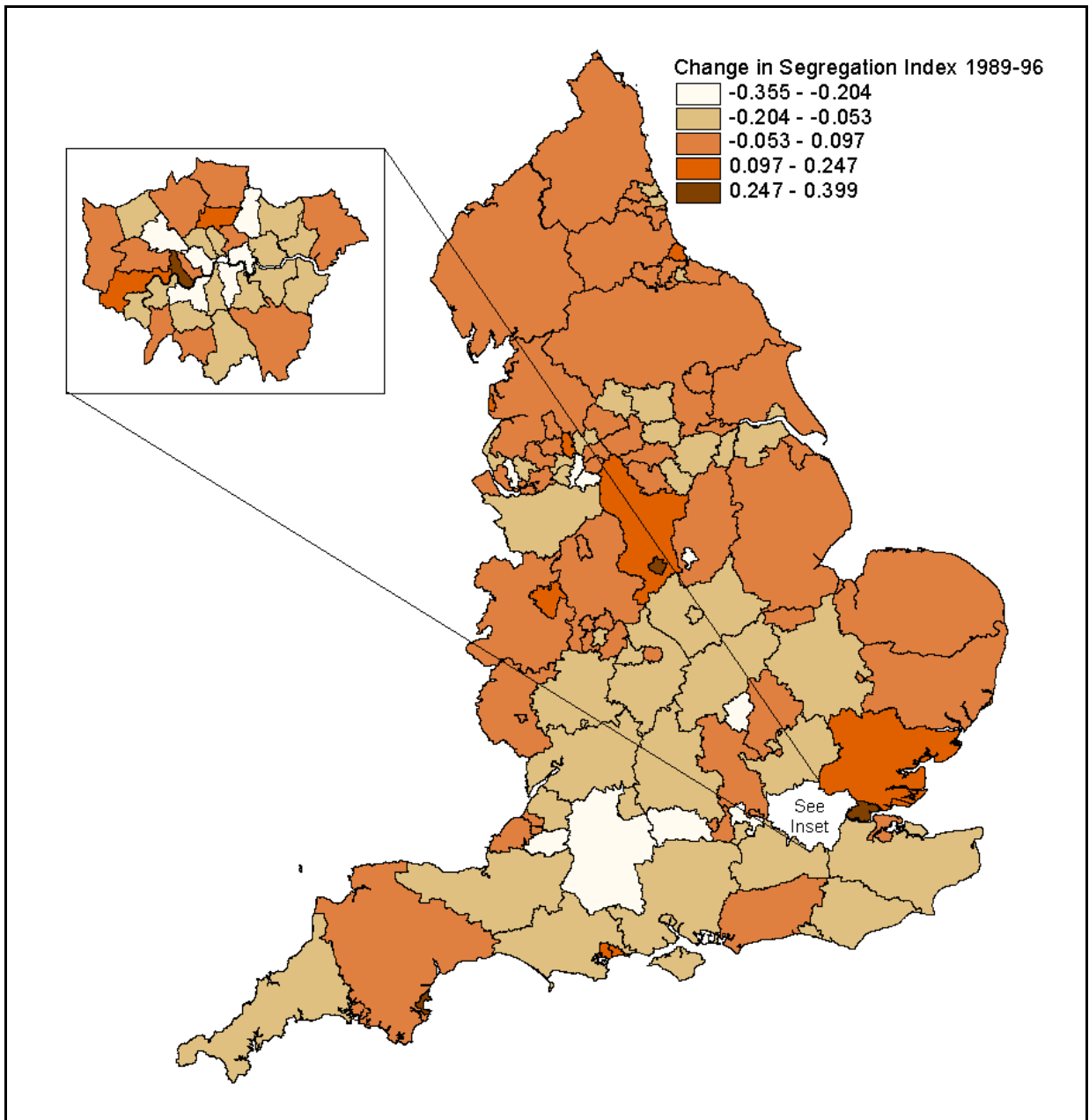
**Figure 2. Socio-economic segregation between secondary schools by LEA, 1996**



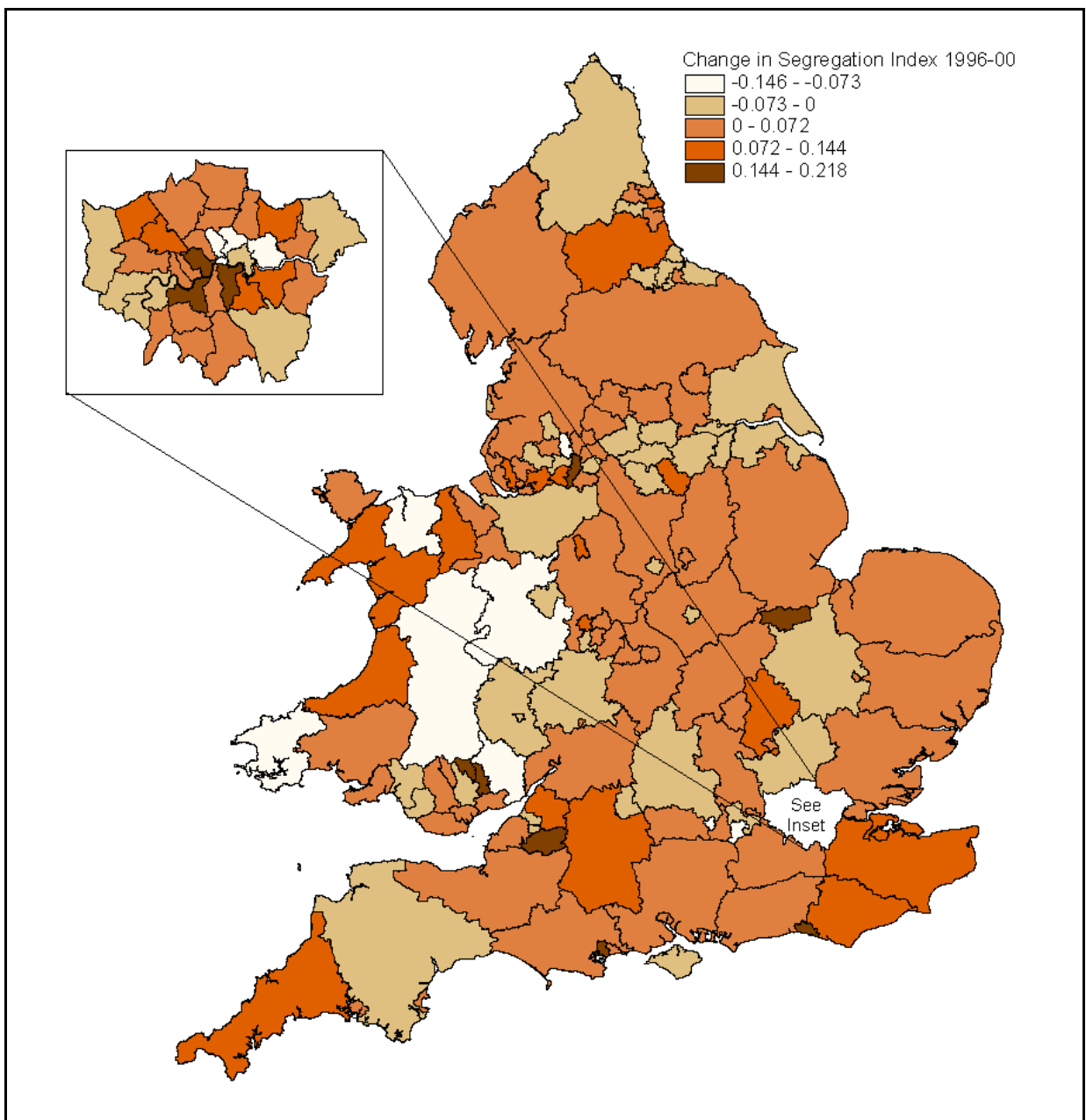
**Figure 3. Socio-economic segregation between secondary schools by LEA, 2000**



**Figure 4. Change in socio-economic segregation between secondary schools by LEA, 1989 to 2000**



**Figure 5. Change in socio-economic segregation between secondary schools by LEA, 1989 to 1996**



**Figure 6. Change in socio-economic segregation between secondary schools by LEA, 1996 to 2000**