

# Ethnic Segregation in England's Schools

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## Abstract

We document ethnic segregation in secondary schools in England in 2001 in order to contribute to the debate on the degree of ethnic group social integration. We use indices of dissimilarity and isolation to compare the patterns of segregation across nine ethnic groups. We find that levels of ethnic segregation in England's schools are high, with considerable variation both across LEAs and across different minority ethnic groups. By combining the two indices we are able to identify areas of particular concern as scoring highly on both. For pupils of Asian origin, we find that these areas coincide almost exactly with the locations of the severe disorders in the summer of 2001. Finally, we show that ethnic segregation is only weakly related to income segregation.

**Keywords:** Ethnic segregation, schools, spatial income clustering

**JEL Classification:** I2

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## 1. Introduction

The degree of ethnic group social integration is a major issue in Britain, and indeed more widely. For example, *The Economist* highlights a “wide-ranging question with no easy answers: can Europe integrate its mainly new, and growing, minorities?”<sup>1</sup> This is clearly a many-faceted issue, and this paper concentrates on just one, ethnic segregation in schools. This complements the substantial literature on residential segregation. The topic of ethnic segregation in schools is one of very long standing, particularly in the US (see Reardon et al (2000) and references therein). It has also been highlighted as a contributory factor in a recent UK Government report on the rioting in northern towns in the summer of 2001 (Cantle 2001). This paper aims to establish some facts concerning ethnic segregation in English schools in 2001.

We measure segregation using indices of dissimilarity and isolation, the two most widely used measures. We compare the patterns of segregation across nine ethnic groups. We also look at the contribution of spatial income clustering to ethnic segregation.

Our main findings are as follows. Levels of ethnic segregation in England’s schools are high. In many local areas, over half the minority pupils would have to switch schools to produce an even spread of ethnic groups. Second, there is considerable variation across groups – segregation is higher for pupils of Indian, Pakistani or Bangladeshi origin than for pupils with black Caribbean or black African heritage. Furthermore, in the former groups, segregation appears to be higher where they are (relatively) numerous, while for black pupils segregation is lower in areas where they are more numerous. Third, combining the dissimilarity and isolation indices, we identify areas of particular concern as scoring highly on both. For pupils of Asian ethnic origin, we find that these areas coincide almost exactly with the locations of the severe disorders in the summer of 2001. This is suggestive that either school segregation plays a direct role in the underlying causes of discontent (as suggested by the Cantle Report on the riots), or is related through a correlation with housing segregation. Our data do not allow us to definitively address these points. Finally, we show that ethnic segregation in schools is only very weakly related to income segregation. That is, there are areas with the same spatial spread of income, but very different levels of ethnic segregation.

The rest of the paper is organised as follows. Section 2 briefly describes some related literature. Section 3 details our dataset, and section 4 the methods we use to measure segregation. Section 5 then presents our results and the final section concludes.

## 2. Previous Literature

The focus of this study is ethnic segregation in English secondary schools. Three related strands of a wide literature on segregation are therefore relevant. First, the issue of what is meant by ‘segregation’ and how best to measure it; second, the evidence on ethnic residential segregation; finally, evidence on both ethnic and income segregation across schools. We briefly review the literature relating to each of these three aspects in turn.

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<sup>1</sup> *The Economist*, 10<sup>th</sup> May 2003, p. 23.

There is a large literature on how to measure segregation, which primarily focuses on residential segregation across urban areal units. Massey and Denton (1988) distinguish five dimensions of residential segregation: evenness, exposure, concentration, centralization and clustering. Each is conceptually distinct, picking up different aspects of the phenomenon. Concentration, centralization and clustering are all explicitly spatial in nature and as such we cannot address them using our data. Here, therefore, we focus on evenness and exposure.

Evenness refers to the differential distribution of two social groups in a city (Massey and Denton 1988). An uneven distribution of a minority group across areal units results in segregation of that group. Following Duncan and Duncan (1955), the most widely used measure of evenness is the index of dissimilarity, *D*. Exposure refers to the degree of potential contact between members of different social groups within areal units. The most widely used measure of exposure is the isolation index, *I* (see Massey and Denton (1988) for a discussion of the relative merits of alternative measures of evenness and exposure). So we pick up on two dimensions of segregation by using both *D* and *I*. While evenness and exposure are conceptually distinct, Massey and Denton find that they are closely correlated empirically. Our results confirm this in the context of school segregation.

The issue of ethnic residential segregation has long been a concern, particularly in the United States. Cutler, Glaeser and Vigdor (1999) provide consistent, long term measures of ethnic segregation in American cities from 1890 to 1990. They conclude that, first, segregation rose until 1970 and then “modestly” declined; second, that segregation across cities is extremely persistent and positively related to city size. Borjas (1997) distinguishes two issues the literature tries to address: the measurement of the degree of segregation in specific geographical areas (Bean and Tienda 1987; Massey and Denton 1989; McKinney and Schnare 1989) and the implications of this “ghettoization” (Case and Katz 1991; Crane 1991; Cutler and Glaeser 1997). The general conclusion from the latter is that neighbourhood effects do have a significant impact on outcomes. Here we focus on the former issue in the context of school segregation; we aim to address the impact of such segregation in later work.

In the UK context, Peach (1996) uses 1991 census data to measure the degree of segregation in British cities and compare this to the levels found in the US. He finds that the proportions individual ethnic minorities form of local area (ward and enumeration district) populations are “nowhere near as high as that formed regularly by the African American population in the US” (page 221). He does find differences between ethnic minorities in Britain, however: Caribbean average levels of residential segregation are much lower than those for Bangladeshis or Pakistanis and generally below those for Indians. We find a similar picture when we consider average levels of school segregation.

As Rivkin (1994) states, any analysis of student segregation using school level data incorporates the influences of both the geographic locations of pupils (or their families) and the attendance policies employed by school districts. He attempts to separately identify these two influences and investigate changes in the levels of both using US data from 1968 to 1988. He concludes that US schools are highly segregated, but that this is primarily due to continued high levels of residential

segregation and that integrative action by school districts will at best have a marginal impact.

Reardon et al (2000) concur with this conclusion. They discuss previous studies (Clotfelter 1998; Orfield et al 1997;) which have used pairwise measures of segregation (majority/minority). In general, such studies show gradual increases of both white/black and white/Hispanic school segregation in the 1990s. In their paper, Reardon et al decompose the entropy index of segregation (a measure of evenness) into several components in order to estimate different minority/minority trends as well as majority/minority. They find that, between 1989 and 1995 in US metropolitan areas, segregation between white students and their black, Hispanic and Asian peers rose, while groups other than white became less segregated from one another. The authors further decomposed the index into geographical components and found that two thirds of metropolitan public-school segregation is between school districts, resulting largely from residential patterns. They conclude that residential segregation remains a significant barrier to school desegregation.

The school segregation literature in the UK has focussed primarily on income segregation, using eligibility for free school meals as an indicator of low income. Gorard and Fitz (1998a, b) use a variant of the isolation index on both Welsh and English data and conclude that income segregation has decreased since the Education Reform Act of 1988 which introduced a quasi-market into the UK education system. Noden (2000) employs both an isolation index and an index of dissimilarity and finds that there has been a consistent rise in the average level of income segregation across English secondary schools across both the exposure and the evenness dimensions of segregation. Goldstein and Noden (2003) extend the analysis by employing multilevel modelling techniques to estimate social segregation trends. They too find evidence of an increase in such segregation in England between 1994 and 1999. These last two results concur more with other studies, which suggest that the quasi-market reforms gradually introduced ways of disadvantaging minorities (Tomlinson 2001). For this analysis we employ similar indices to investigate segregation by ethnicity.

### 3. Data

We use data from the Annual Schools Census (ASC), or 'Form 7' as it was previously known, which covers all schools. Returning this data is a mandatory requirement for schools. We focus on state maintained secondary schools in England in 2001 (the pupils are aged from 11 to 16 or 18). We use data on the ethnic composition of schools, along with a number of other school level characteristics. We match on to this some area (ward-based) data. Data on ethnic identity for each individual pupil is now becoming available in PLASC (Pupil Level Annual Schools Census) and is the subject of ongoing research.

One important question in this field is the definitions of ethnicity available. Often, these are rather aggregated, while other evidence and casual empiricism suggests that there is a diversity of experience within such broad ethnic groups<sup>2</sup>. This data is a little

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<sup>2</sup> For example, incidence of low income is very different: in 2000/01, 60% of Pakistanis and Bangladeshis lived in low-income households, compared to 25% of Indians, 19% of black Caribbeans and 17% of whites. (Source: <http://www.statistics.gov.uk/cci/nugget.asp?id=269> using HBAI and Family Resources Survey). See also Dorsett (1998).

better, but still not very disaggregate. The data available to us give the number of pupils in each school classified as being of:

- black Caribbean heritage
- black African heritage
- black other heritage
- Indian ethnic origin
- Pakistani ethnic origin
- Bangladeshi ethnic origin
- Chinese ethnic origin
- any other minority ethnic origin
- white ethnic origin

For comparison with more aggregated groups in other work, we also report results for the created groups ‘Black’ combining the three black groups, and ‘Asian’ combining Indian, Pakistani and Bangladeshi<sup>3</sup>.

We compare ethnic segregation to income-related measures of segregation. We use pupils’ eligibility for Free School Meals (FSM), which is related to the parental income, and is available at school level in the ASC. The figure used is the percentage of pupils in the school known to be eligible for free school meals (but not necessarily claiming). We also match in spatial data on deprivation. We use the Index of Multiple Deprivation (IMD), available at ward level<sup>4</sup>. The components of this index are subindices relating to income; employment; health; education; housing; and geographical access to services. We compute the standard deviation of the ward-level indices across each Local Education Authority (LEA) as a measure of spatial income segregation in the LEA.

We make a small number of sample selection decisions. We omit independent schools, special schools and other academic centres such as hospital schools and detention centres. We also drop schools that could not be matched using school number. We omit the nine schools with missing ethnicity data, and we drop all schools from LEAs with very few schools: the Isles of Scilly (1 school), the Isle of Wight (5), Rutland (3), Kensington and Chelsea (4), and Hartlepool (5).

Table I describes the ethnicity of the pupils in our dataset adding up over all of England. Clearly, the majority overall are white, with about 1.5% of black Caribbean heritage, 2.0% other black heritage, 2.7% Indian ethnicity and 2.5% Pakistani heritage. Table I also provides the same breakdown from the 2001 Census for England. This column shows the difference between school age children and the whole population. The comparison shows that ethnic minorities form a slightly higher proportion of children than of the population as a whole.

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<sup>3</sup> This corresponds to Peach’s (1996) ‘South Asian’ category.

<sup>4</sup> See <http://www.neighbourhood.statistics.gov.uk/metadata.asp?dsno=18> for the data and <http://www.urban.odpm.gov.uk/research/summaries/03100/pdf/rrs03100.pdf> for details of construction of the indices. Note that both FSM and IMD are measures of the income distribution across the whole population and are not specific to any minority ethnic group(s).

## 4. Measuring segregation

Segregation is a characteristic of an aggregate of units, in our case schools. We ask whether students from different ethnic backgrounds are distributed evenly or not over the schools in a grouping of schools. There are different possibilities available to group schools. Administrative geographies such as LEAs are widely used in other studies, and are important for two reasons. First, they are policy-making bodies and so might be expected to have an impact (and some responsibility). Second, they occupy the same borders as Local Authorities (LA)<sup>5</sup>, which allows other background data to be matched in. An alternative geography is based on parents' decisions on where to live, and how far to commute their children to school. These are equivalent to overlapping catchment districts around schools. In this study, we use LEAs and postpone study of catchment areas to later work.

Following the literature, we focus on two main measures of segregation. These are a measure of dissimilarity (evenness), and a measure of isolation (exposure). Massey and Denton (1988) discuss these and other measures in detail, setting out their advantages and disadvantages. No single measure captures all aspects of segregation, and all have some statistical shortcomings. Nevertheless, these two are the mostly widely used. The dissimilarity index was discussed in detail by Duncan and Duncan (1955), and used for example more recently by Cutler, Glaeser and Vidgor (1999) for the US. The formula for the index of dissimilarity,  $D$ , is given by the following, taking the example of black Caribbean heritage:

$$D = 1/2 \sum_{i=1}^N \left| \frac{BAC_i}{BAC_{total}} - \frac{(ALL - BAC)_i}{(ALL - BAC)_{total}} \right| \quad (1)$$

where  $BAC_i$  is the number of students of black Caribbean heritage in school  $i$ ,  $ALL_i$  is the total students in school  $i$ ,  $BAC_{total}$  is the total number of students of black Caribbean heritage in the LEA,  $(ALL - BAC)_i$  is the number of students not of black Caribbean heritage in school  $i$ ,  $(ALL - BAC)_{total}$  is the number of students not of black Caribbean heritage in the LEA, and  $N$  is the number of schools in the LEA. Note that our calculation therefore measures the segregation of each minority relative to all other groups combined. We additionally compare each group against each other pairwise, individually, using  $D$  and taking London as the aggregate spatial unit. The dissimilarity index ranges from 0 to 1 and, continuing the above example, has the interpretation of the fraction of students of black Caribbean heritage in the LEA that need to be moved to different schools in order to make each school have the same composition in terms of that group. Cutler, Glaeser and Vidgor (1999) quote Massey and Denton (1993) suggesting that values of 0 – 0.3 are considered to be low, 0.3 – 0.6 moderate, and 0.6 and above high.

We also compute an isolation index. Continuing the example of students of black Caribbean heritage, this is essentially the percentage of the school belonging to this group, averaged over all students in that group. In other words, it is interpretable as the average probability of meeting someone with the same ethnicity as you. The core expression for this is:

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<sup>5</sup> Some LEAs comprise more than one LA, but in these cases the latter can be exactly aggregated into the former; the other LEAs are equivalent to LAs.

$$I = \sum_{i=1}^N \frac{BAC_i}{BAC_{total}} \cdot \frac{BAC_i}{ALL_i} \quad (2)$$

This needs to be adjusted to take account of areas with small representations of the ethnic group in question. We follow Cutler, Glaeser and Vidgor (1999) in adopting the following form (see their discussion for more details):

$$I = \frac{\sum_{i=1}^N \frac{BAC_i}{BAC_{total}} \cdot \frac{BAC_i}{ALL_i} - \left( \frac{BAC_{total}}{ALL_{total}} \right)}{\min \left( \left( \frac{BAC_{total}}{\min(ALL_i)} \right), 1 \right) - \left( \frac{BAC_{total}}{ALL_{total}} \right)} \quad (3)$$

where  $\min(ALL_i)$  is the size of the smallest school. This ranges from 0 to 1, with a value of 0.3 being considered high.

We calculate (1) and (3) for each ethnic group defined above. We do this first at the national level, that is defining the aggregate as the whole of England. Second, we repeat this for each LEA, treating each of these in turn as the aggregate.

## 5. Results

We present three main sets of results. First, we simply describe the ethnic composition of schools and LEAs. Second, we present the results of calculating the two segregation indices at national and LEA levels. Third, we relate these to measures of income segregation.

### *Ethnic Composition of Schools*

Before examining the degree of segregation of students from different ethnic backgrounds across schools, it is worth briefly considering the distribution of the overall totals. Table II shows the mean values and some of the upper quantiles for the different groups across schools in 2001. These are weighted by school size (total pupils). Most schools are overwhelmingly white – the median is 97% white. The median values for all other groups are all less than 1%. Even in the “most black” or “most Asian” schools – that is, those in the top 5% of schools with black (respectively Asian) pupils – that ethnic group is still in the minority. In the column labelled ‘max’ we report the maximum proportion of each ethnic minority in any one school. These schools represent a wide range of geographical locations, largely reflecting the residential clustering of different minority ethnic groups across England (we discuss this further below). For example, the schools with the most black Caribbean, black African and black other heritage pupils are found, respectively, in Haringey, Southwark and Lambeth. The corresponding school with respect to Pakistani ethnic origin is a girls only comprehensive in Bradford, while that for Bangladeshi is a boys only comprehensive school in Tower Hamlets. The same statistics over LEAs are given in Table III.

### *Indices of Segregation*

The two indices of segregation taking England as a whole are shown in Table IV. This is provided for completeness rather than as the major piece of evidence as households from different ethnic groups are not spread evenly over the country. The very high

figures reflect this residential clustering. Map 1 shows this for the aggregate of all non-white groups in England and Wales. Clearly, the higher concentrations of non-white groups are in the main urban centres, London, the Midlands cities and Northern towns and cities. There are also differences between ethnic minority groups, as reflected in the geographical spread of schools described above and discussed more fully by Peach (1996).

The Dissimilarity index was calculated for each LEA separately (that is, taking the LEA as the aggregate unit) and for each ethnic group separately. Table V shows its distribution over all LEAs, separately for each group. Taking the group of black students with Caribbean heritage, we see a mean of 0.53 and a median of 0.54. Thus in the average<sup>6</sup> LEA, over half of the students from this group would have to be moved to achieve a common representation. All of the top quartile of LEAs for this group fall above the Denton-Massey 'high' figure of 0.6, and in the top 10% most segregated LEAs, the index is over 0.75. These calculations suggest both a high level of segregation on average, and a significant degree of variation in this across LEAs.

These comments apply qualitatively to the other ethnic groups detailed in the table. Indeed, for students of Bangladeshi and Pakistani ethnicity, even the average degree of segregation exceeds 0.6, and the 75<sup>th</sup> percentile is over 0.7.

Adding up to the aggregate categories of Asian and Black, these broader categories produce lower segregation scores, but not low. Figure 1 shows the whole distribution across LEAs for these groups. Again, both the variation and the high level are brought out in the figure.

Table VI provides the same data for the Isolation index. The low level of the numbers in general reflects the fact that in many LEAs, students from non-white ethnicities are rather rare. However, at the top end of the distribution, these numbers grow substantially, particularly for the Asian groups. Again students of Bangladeshi and Pakistani ethnicity stand out as being particularly segregated. Two issues requiring further exploration are the potential associations between ethnic segregation and gender segregation (i.e. the choice of single sex schools) for some Asian students, and between ethnic segregation and faith schools. These may be explanatory factors in the differential levels of segregation experienced by black and Asian students.

These tables all compare the specific minority against the remaining majority. A different question is to ask how the different groups are segregated amongst themselves. To address this, we compare each group against each other pairwise, individually. For this analysis we focus just on London as the aggregate spatial unit. This is because, as argued above, a national level analysis makes little sense, and we need a large area with enough pupils from each group, so combining the London LEAs yields a sensible spatial unit. The results are in Table VII. A number of interesting points emerge. First, black pupils with African heritage and black pupils with Caribbean heritage are not segregated from each other (dissimilarity score of 0.261), whereas pupils of Indian ethnic origin and Pakistani ethnic origin are more highly segregated from each other (0.382). Second, pupils of Bangladeshi origin are highly segregated from all other groups – their lowest score is 0.662. Third, Asian and

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<sup>6</sup> Average in the sense of this index for this group.



black pupils are highly segregated from each other. Indeed, black pupils are more highly segregated from Asian pupils than they are from whites, even within London. Fourth, whites are least segregated from Chinese students (0.400), then black students (0.492), Indian (0.616), Pakistani (0.680) and Bangladeshi students (0.758). The patterns we find across London schools are similar to those found by Peach (1996) across wards in Greater London using 1991 Census data.

The same picture holds over all England too. Looking across all schools in which whites form less than 60% of all students, a simple correlation of the percentage of black students and the percentage of Asian students yields  $-0.619$ . Correlating Indian and Pakistani students across schools with more than 30% Asian students gives  $-0.496$ , whereas correlating black African and black Caribbean students across schools where they number more than 30% only gives  $-0.048$ . These findings illustrate the complexity of segregation patterns, both between majority and different minority groups as well as between different ethnic minorities.

As Table III illustrates, the number of students from Asian, black and other ethnicities varies across LEAs. One factor that may mediate the impact of the degree of segregation on the community is whether high segregation for a group tends to occur where that group is relatively numerous, or relatively rare. Figure 2 addresses this issue for the two aggregate groups, plotting the level of the group (% students black; % students Asian) against the index  $D$  in Figure 2a and against the index  $I$  in Figure 2b. There is clearly an interesting difference between the two groups. Consider first Figure 2a. According to the index of dissimilarity, in areas where black students are relatively numerous they tend to be less segregated than in areas where they are fewer. However, the reverse is true for Asian students: where they form a larger proportion of the student body there tends to be higher segregation. The correlation coefficients are  $-0.44$  and  $+0.17$  respectively, both significant at 5%<sup>7</sup>. Figure 2b, in which we use the isolation index of segregation, also shows that there is a stronger (positive) relationship between representation and segregation for Asian students than for their black peers. Thus the same level of segregation (or the same degree of representation) may be felt differently for the two groups<sup>8</sup>.

Figure 3 shows the two dimensions of segregation together for the two aggregated groups. Note that in the context of US cities, Cutler, Glaeser and Vidgor (1999) define a ghetto as an area that has a dissimilarity index greater than 0.6 and an isolation index greater than 0.3.

Looking first at the graph for black students, there are no areas that have extreme segregation indices in both dimensions. Of the two LEAs that come closest, North Lincolnshire and Darlington, both have less than 1% of black students. The situation is rather different for students of Asian ethnic origin. Here there are five LEAs with extreme segregation indices in both dimensions: Oldham, Blackburn, Bradford, Birmingham and Luton. Furthermore, these are all areas with significant representations of these students:

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<sup>7</sup> This is slightly misleading in the sense that taking students of Indian and Pakistani ethnic origins separately, both show no correlation between level and index. But for black students with Caribbean heritage, and with African heritage, they both show a strong negative relationship.

<sup>8</sup> The differences between Figures 2a and 2b may be partly explained by the fact that the two measures are attempting to capture different dimensions of segregation.

LEA	% Asian students
Bradford	29.0
Luton	27.9
Birmingham	26.8
Blackburn with Darwen	23.8
Oldham	15.5

It is interesting to note that some of these areas suffered severe rioting by Asian and white youths in the summer of 2001: Bradford, Oldham and Burnley<sup>9</sup>. The Community Cohesion Review Team, chaired by Ted Cantle (Cantle 2001) which published a report on these disturbances for the Home Office identified segregation in education as one contributory factor to the lack of community cohesion which in turn led to disorder:

“...The extent to which these physical divisions were compounded by so many other aspects of our daily lives, was very evident. *Separate educational arrangements*, community and voluntary bodies, employment, places of worship, language, social and cultural networks, means that many communities operate on the basis of a series of parallel lives” (paragraph 2.1, emphasis added).

This evidence is suggestive, no more, of an association between educational segregation and social unrest. It is not clear from these data alone whether school segregation is picking up housing segregation and it is this that engenders severe discontent, or whether school segregation itself may play a role.

Panels c and d of Figure 3 repeat the exercise for Indian and Pakistani students separately. There are more areas of extreme segregation for the latter group, and the areas of Bradford, Luton, Birmingham and Oldham are again prominent. Bedfordshire and Knowsley are also in the top quadrant, but have negligible numbers of Pakistani students (1% and 0.01%). In the graph for students of Indian ethnic origin, Leicester with 32% of such students also has very high segregation.

### *Ethnic Segregation and Income segregation*

Given the correlation between ethnicity and poverty<sup>10</sup>, it is important to see whether ethnic segregation simply reflects income segregation across space. We have two measures of the latter. First, we use a school average level measure of deprivation, and compute the *D* index measure using that as above for each LEA. This is based on whether a child is eligible for free school meals (FSM), a means-tested benefit widely used to investigate income segregation in schools (see Noden 2000). Figure 4 graphs the *D* index for FSM against the *D* index for ethnicity for the two aggregated groups. It is clear that there is essentially no relationship between the two indices for either

<sup>9</sup> The last of these towns is actually in the Lancashire LEA, but is geographically sandwiched between Blackburn and Rochdale; both Lancashire and Rochdale are close to the top right quadrant of Figure 3b.

<sup>10</sup> For some groups, but not all – recall footnote 1 shows that Pakistanis, Bangladeshis and Black Africans suffer higher rates of poverty, but black Caribbeans, Indians and Chinese do not.

ethnic group. In other words: there is both high and low ethnic segregation in both high and low FSM segregation areas.

The second measure of spatial income distribution is based on the LEA variability of the ward-level index of multiple deprivation. This is plotted against the *D* index for ethnicity for the two ethnic groups in Figure 5. There is again little relationship between the two for black students. However, for the Asian group we do find a significant positive relationship. Ethnic segregation of Asian students is higher in LEAs with greater spatial income dispersion.

The generally weak relationship between ethnic and income segregation mirrors the results of Peach (1996), who estimates the importance of economic factors in residential segregation in Greater London and concludes that all ethnic groups would manifest much lower segregation levels if it were solely economic factors that controlled their residential distribution. He estimates, for example, that only 8% of the observed level of black Caribbean segregation is ‘explained’ by socio-economic factors. Dorsett (1998) further highlights the differences between minority ethnic groups in relation to their individual and household socio-economic characteristics and the resulting differences in their patterns of settlement across differentially deprived neighbourhoods.

## 6. Conclusion

In this paper we focus on one dimension of the debate regarding social integration between ethnic groups and document the extent of ethnic segregation in English secondary schools in 2001. We employ the two most widely used indices of segregation – the index of dissimilarity and the isolation index – and compare patterns of school segregation across nine ethnic groups.

Our main findings are that levels of ethnic segregation in England’s schools are high. There is, however, a significant degree of variation both across LEAs and across ethnic groups: segregation is higher for pupils of Indian, Pakistani or Bangladeshi origin than for pupils with black Caribbean or African heritage. Segregation for the former groups is positively related to their proportion in the local population, while the same is not true for the Black aggregate group. When we combine the two indices we identify areas of particularly high segregation, especially for pupils of Asian origin. These areas coincide almost exactly with the locations of urban unrest in the summer of 2001. Finally, we show that ethnic segregation is only weakly related to income segregation.

Residential segregation is undoubtedly a multi-faceted issue (Blalock 1967). As Massey and Denton (1998) state: ethnic segregation arises from a “complex interplay of many different social and economic processes”; it does not simply follow income or class contours. Both choices and constraints may be important in determining residential location (Dorsett 1998). School segregation can be viewed as adding a further layer onto an already complex picture. The relevant factors determining the level of school segregation include geographical location, social class and the history of particular schools. In the UK we can add to this list the impact the education quasi-market and the emphasis on parental choice has had on the degree of ethnic

segregation (Tomlinson 2001). This suggests several avenues for further research in this field, and there are in particular three questions we intend to follow up.

First, do schools act to intensify or ameliorate residential segregation, and if this varies, with what factors? We will exploit the recently released Census 2001 alongside our current data to compare residential and educational segregation across England. Second, what is the role of markets and competition between schools in this process? Since the Education Reform Act of 1988, which introduced overlapping catchment areas, school league tables and devolved budgets, the education system has been more responsive to parents' choices. The degree to which competition is feasible varies over the country, and we intend to use this to get at the role of markets in segregation. Third, what is the impact of different levels of segregation on the educational attainment of minority ethnic pupils? We can now address this question using the recently released Pupil Level Annual Schools Census (PLASC), which matches information on ethnicity with exam results for every pupil at each Key Stage of compulsory education. Exploring these links further and investigating their impact is a worthy subject of ongoing research.

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Table I: Pupils in Secondary Schools in England, in 2001

	%	Number	Population (%)
Black Caribbean heritage	1.455	43219	1.142
Black African heritage	1.227	36446	0.969
Black other heritage	0.816	24238	0.194
Indian ethnic origin	2.712	80556	2.093
Pakistani ethnic origin	2.488	73902	1.438
Bangladeshi ethnic origin	0.973	28902	0.560
Chinese ethnic origin	0.399	11852	0.449
Other minority ethnic origin	2.537	75358	2.230
Asian	6.173	183360	4.091
Black	3.498	103903	2.305
White ethnic origin	87.393	2595881	90.925
	100	2970354	
		(3060 schools)	

Final column from 2001 Census, refers to all ages.

Table II: Average School Ethnic Composition (%), 2001, School level

	mean	p50	p75	p90	P95	P99	max	N
Black Caribbean heritage	1.455	0.132	0.768	3.846	8.584	19.948	72.787	3060
Black African heritage	1.227	0.118	0.451	2.851	7.637	21.091	49.579	3060
Black other heritage	0.816	0.152	0.56	2.159	3.938	10.728	30.297	3060
Indian ethnic origin	2.712	0.406	1.598	6.004	14.374	39.32	98.084	3060
Pakistani ethnic origin	2.488	0.139	0.976	5.832	13.619	43.913	88.088	3060
Bangladeshi ethnic origin	0.973	0	0.331	1.207	3.495	18.486	98.61	3060
Chinese ethnic origin	0.399	0.224	0.499	0.965	1.399	2.957	35.294	3060
Other minority ethnic origin	2.537	0.623	2.064	6.751	11.321	22.89	99.919	3060
Asian	6.173	0.847	4.298	17.711	33.333	75.31	99.251	3060
Black	3.498	0.534	1.986	9.818	19.872	43.078	86.885	3060
White ethnic origin	87.393	97.105	98.911	99.47	99.697	100	100	3060

*Weighted by pupil numbers*

The p50 etc values refer to the 50<sup>th</sup> percentile of the relevant distribution.



Table III: Average LEA School Ethnic Composition (%), 2001

	p50	p75	p90	p95	P99	max	N
Black Caribbean heritage	0.263	1.038	4.542	7.359	16.567	23.613	144
Black African heritage	0.178	0.4	2.15	7.484	15.7	29.143	144
Black other heritage	0.259	0.607	1.865	3.991	6.752	17.361	144
Indian ethnic origin	0.73	2.246	7.697	11.661	30.741	32.504	144
Pakistani ethnic origin	0.612	2.789	7.615	13.594	24.418	24.418	144
Bangladeshi ethnic origin	0.191	0.605	1.827	3.372	11.321	54.877	144
Chinese ethnic origin	0.301	0.452	0.746	1.07	1.797	1.951	144
Other minority ethnic origin	0.921	2.624	8.909	10.228	18.011	21.758	144
Asian	2.046	6.118	16.437	29.016	38.503	56.525	144
Black	0.746	2.253	9.442	18.739	34.803	54.648	144
White ethnic origin	95.195	97.952	98.901	99.194	99.481	99.481	144

*Weighted by pupil numbers*

The p50 etc values refer to the 50<sup>th</sup> percentile of the relevant distribution.

Table IV: Segregation Indices, National level

	Dissimilarity Index	Isolation Index
Black Caribbean heritage	0.7092	0.1009
Black African heritage	0.7458	0.1146
Black other heritage	0.6523	0.0565
Indian ethnic origin	0.6881	0.2093
Pakistani ethnic origin	0.756	0.2558
Bangladeshi ethnic origin	0.7725	0.2875
Chinese ethnic origin	0.4482	0.0089
Other minority ethnic origin	0.613	0.1751
Asian	0.6978	0.3241
Black	0.6867	0.1992

Table V: Dissimilarity Indices – LEA Level

	mean	p10	p25	p50	p75	p90	max
Black Caribbean heritage	0.530	0.277	0.426	0.540	0.632	0.755	0.954
Black African heritage	0.497	0.293	0.395	0.489	0.612	0.654	0.858
Black other heritage	0.505	0.312	0.417	0.490	0.590	0.715	0.897
Indian ethnic origin	0.481	0.306	0.400	0.474	0.555	0.656	0.860
Pakistani ethnic origin	0.610	0.396	0.510	0.627	0.715	0.773	0.961
Bangladeshi ethnic origin	0.630	0.394	0.498	0.650	0.743	0.840	0.973
Chinese ethnic origin	0.396	0.284	0.346	0.399	0.444	0.503	0.658
Other minority ethnic origin	0.416	0.267	0.318	0.404	0.499	0.553	0.947
Asian	0.491	0.320	0.400	0.501	0.589	0.643	0.716
Black	0.394	0.236	0.340	0.399	0.454	0.553	0.653

Table VI: Isolation Index – LEA level

	mean	p10	p25	p50	p75	p90	max
Black Caribbean heritage	0.062	0.011	0.019	0.030	0.063	0.123	0.954
Black African heritage	0.044	0.007	0.015	0.026	0.052	0.096	0.494
Black other heritage	0.048	0.010	0.017	0.029	0.054	0.106	0.513
Indian ethnic origin	0.054	0.010	0.018	0.037	0.069	0.126	0.380
Pakistani ethnic origin	0.099	0.020	0.034	0.070	0.134	0.228	0.857
Bangladeshi ethnic origin	0.102	0.009	0.030	0.066	0.137	0.257	0.797
Chinese ethnic origin	0.026	0.006	0.010	0.018	0.030	0.054	0.232
Other minority ethnic origin	0.057	0.008	0.013	0.024	0.044	0.082	0.784
Asian	0.091	0.012	0.023	0.060	0.136	0.234	0.421
Black	0.034	0.008	0.011	0.024	0.044	0.080	0.257

Table VII: Pairwise Dissimilarity Indices for London

	Black Caribbean	Black African	Black other	Indian	Pakistani	Bangla- deshi	Chinese	Other minority	Asian	Black	% Pupils in London
Black Caribbean											6.7
Black African	0.261										7.5
Black other	0.383	0.421									3.2
Indian	0.623	0.604	0.666								8.6
Pakistani	0.599	0.584	0.621	0.382							3.4
Bangladeshi	0.712	0.662	0.729	0.749	0.691						4.1
Chinese	0.490	0.468	0.504	0.565	0.651	0.683					1.0
Other minority	0.423	0.376	0.464	0.498	0.541	0.665	0.430				7.4
Asian	0.583	0.542	0.608	-	-	-	0.557	0.483			16.2
Black	-	-	-	0.608	0.579	0.677	0.451	0.363	0.546		17.6
White	0.528	0.524	0.511	0.616	0.680	0.758	0.400	0.459	0.617	0.492	57.8

Dissimilarity Index (Duncan and Duncan)

London Schools only (387)

Taking London as the aggregate spatial unit

Figure 1: Dissimilarity Index – LEA Level



Figure 2a: Dissimilarity Index and Level

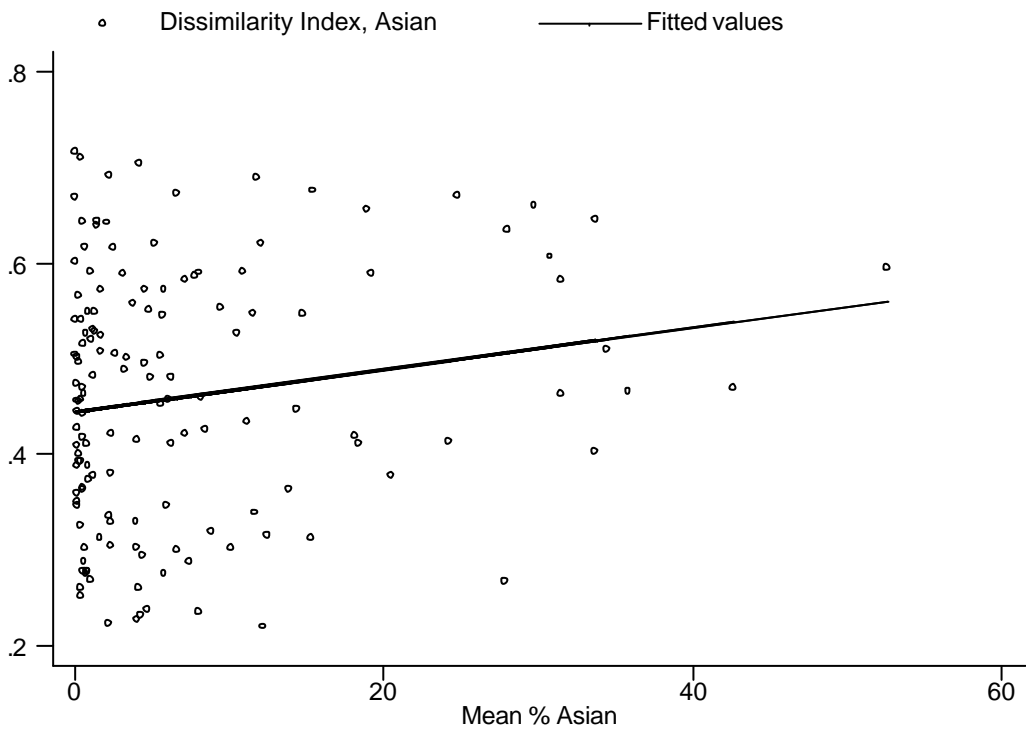
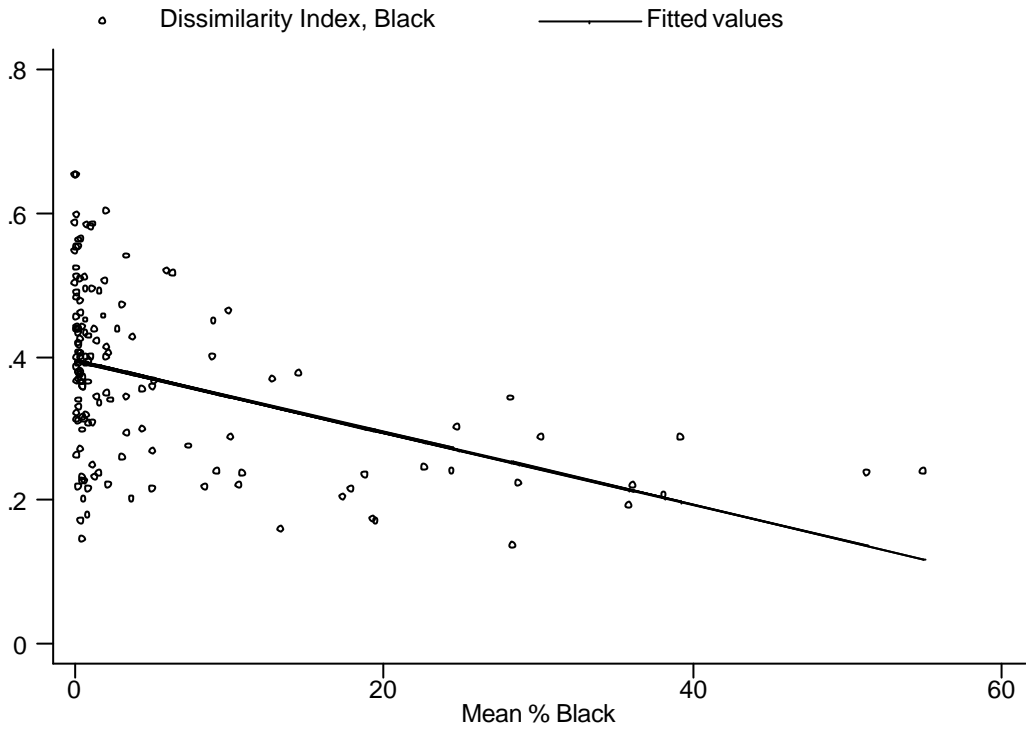


Figure 2b: Isolation Index and Level

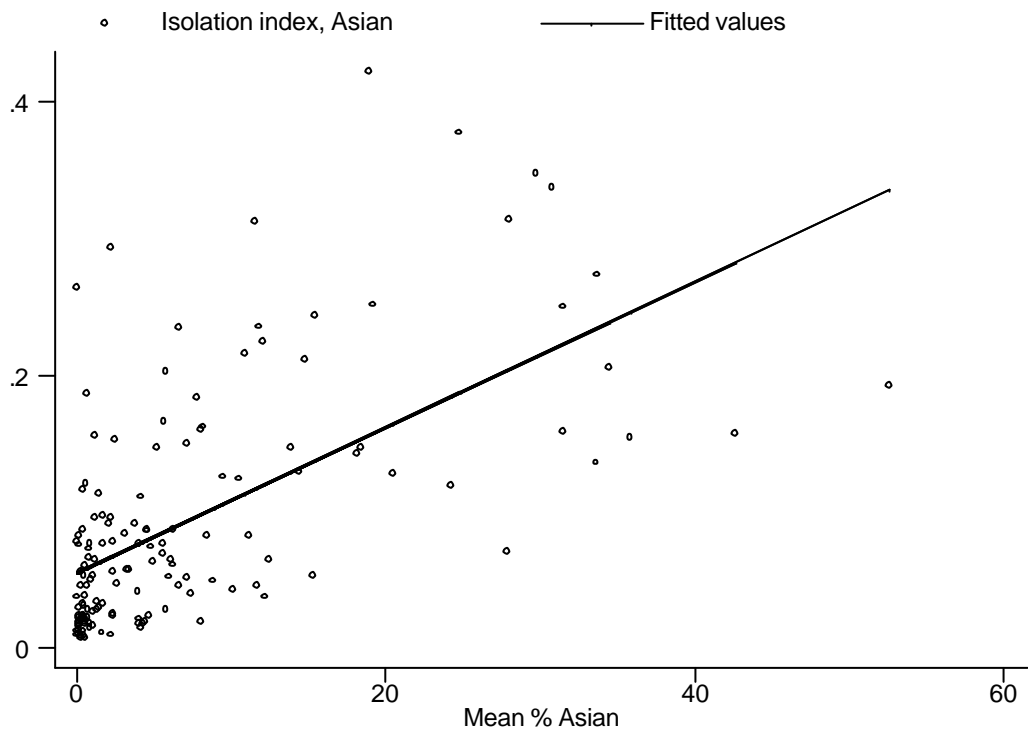
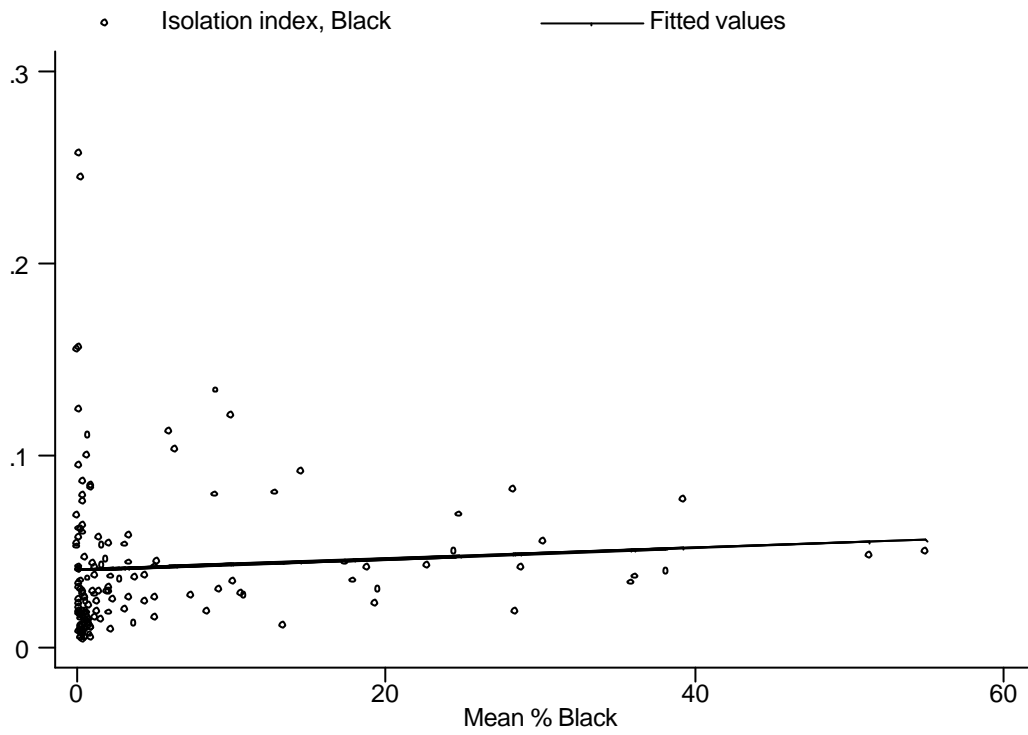




Figure 3: Dissimilarity Index and Isolation Index

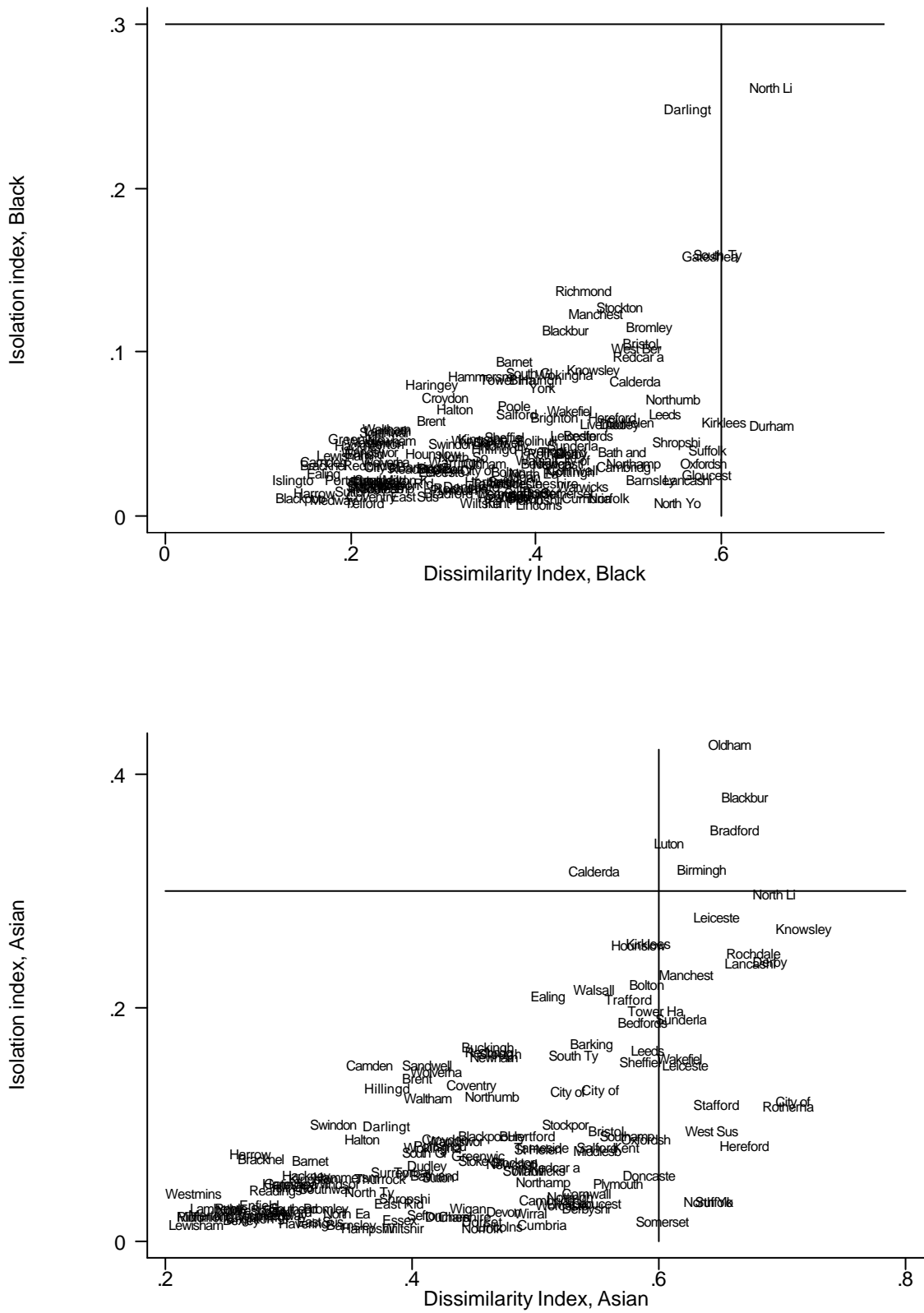


Figure 3: Dissimilarity Index and Isolation Index, continued

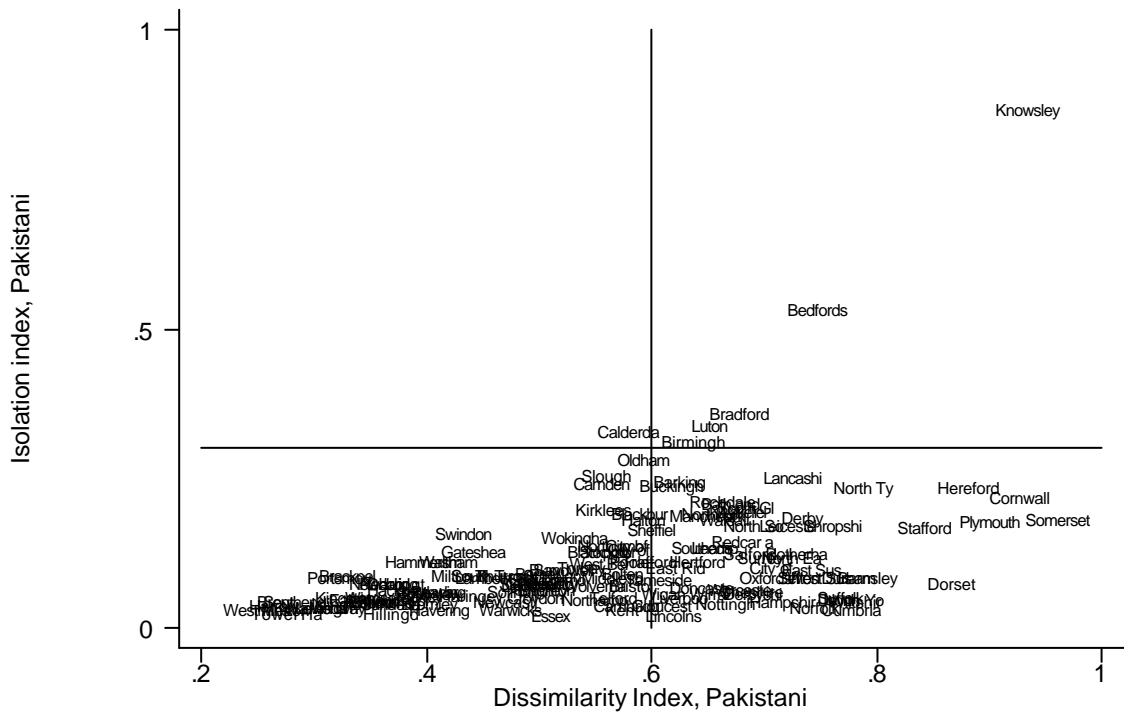
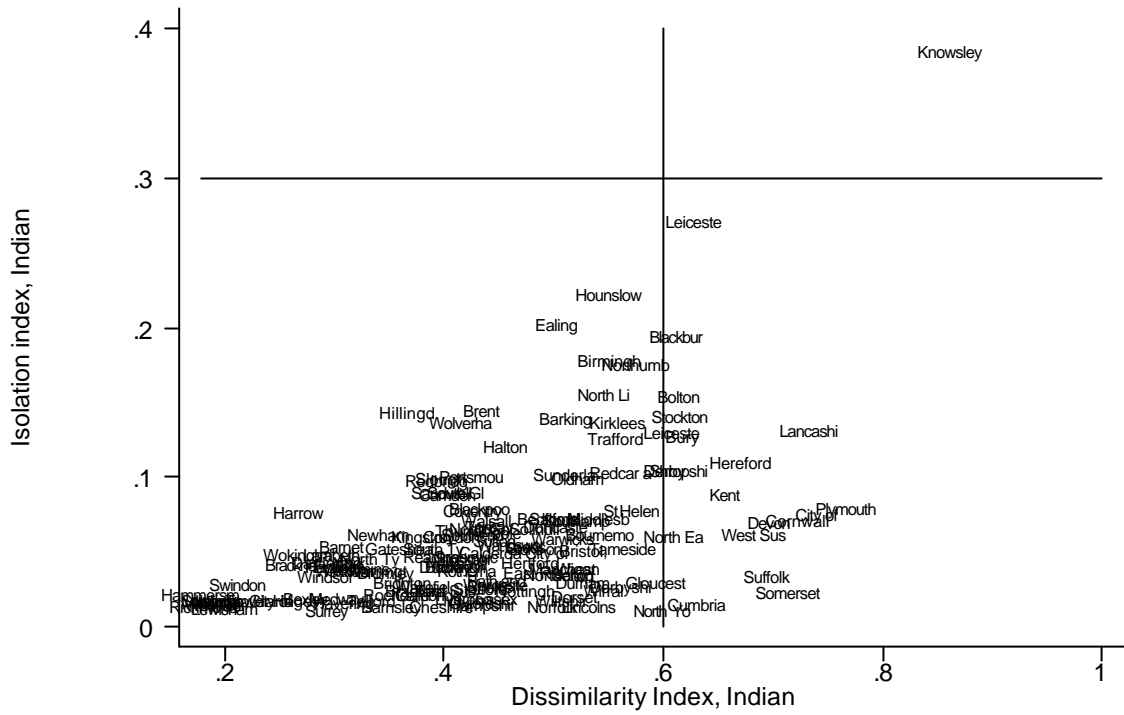


Figure 4: Dissimilarity Index and FSM Segregation

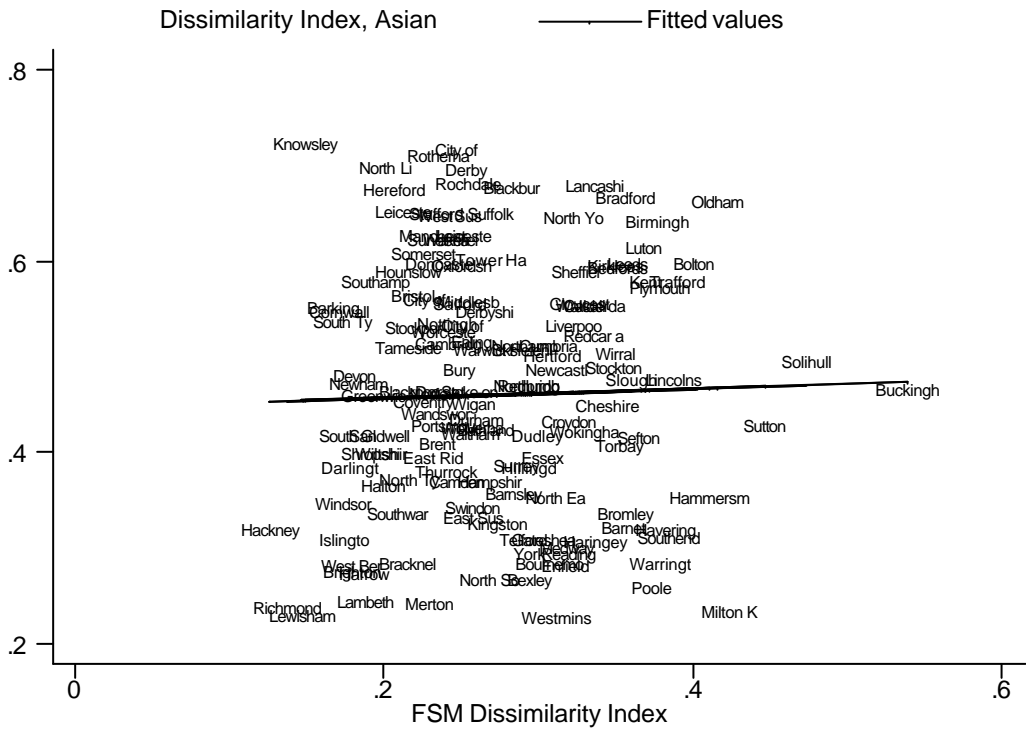
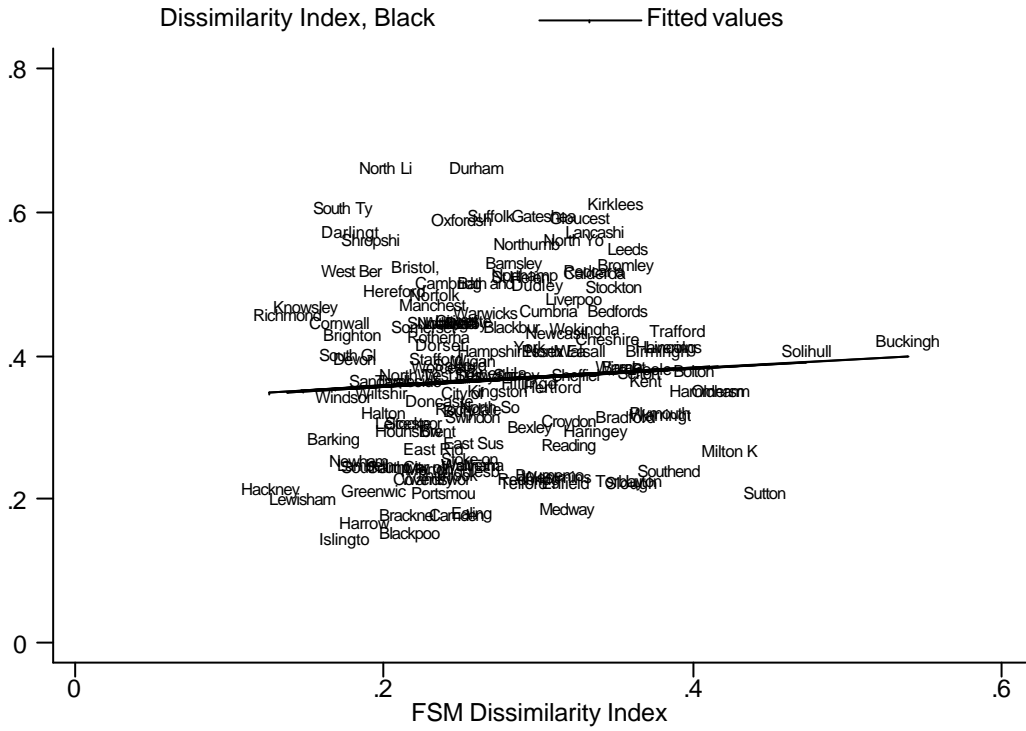
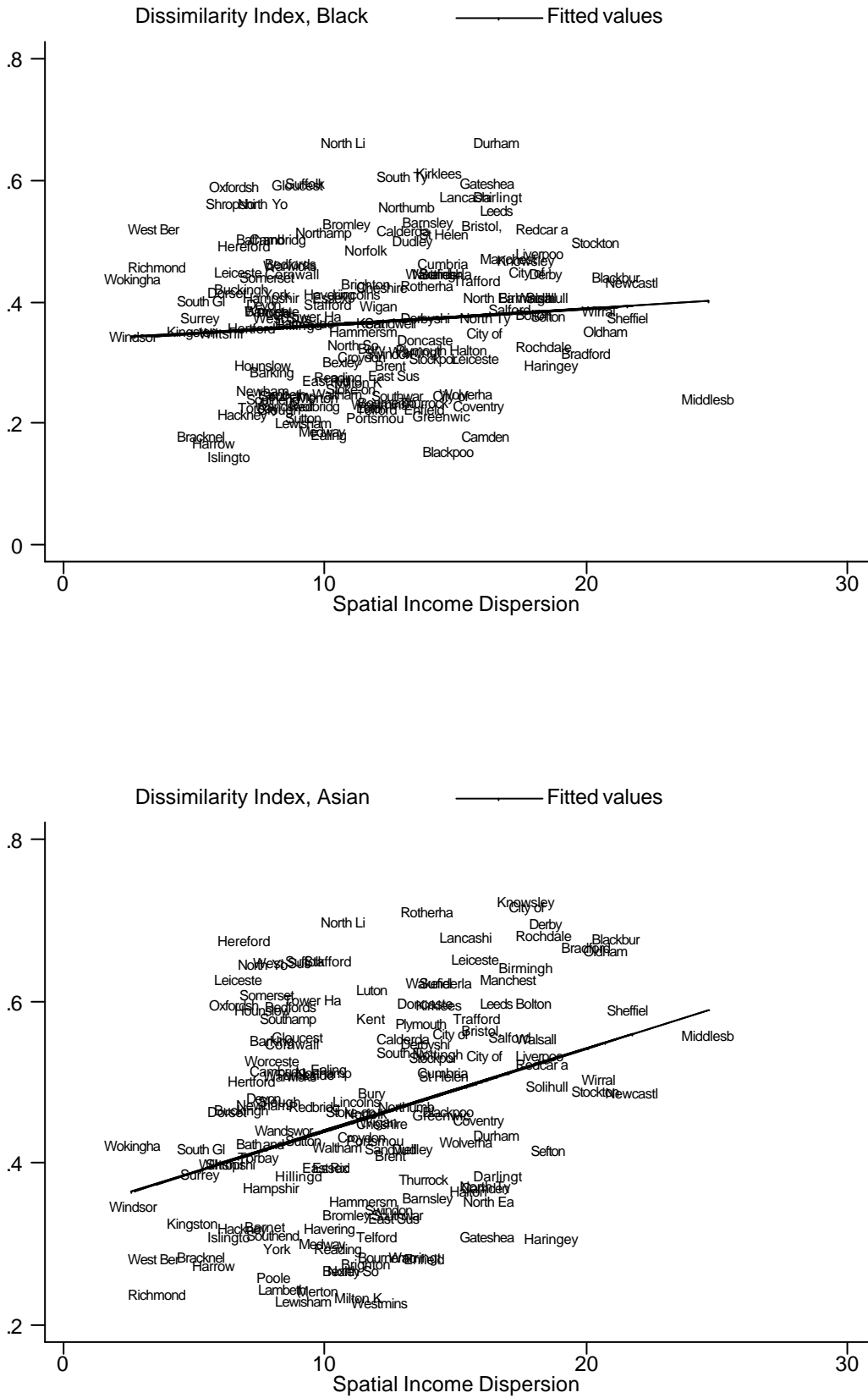


Figure 5: Dissimilarity Index and Spatial Income Dispersion



# Map 1: Non-white Ethnic Group in England and Wales, 2001

Source: [http://www.statistics.gov.uk/census2001/downloads/ethnic\\_group.pdf](http://www.statistics.gov.uk/census2001/downloads/ethnic_group.pdf)

