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<u>Settlement area migration in England and Wales: assessing evidence</u> <u>for a social gradient</u>

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Abstract

This paper uses a commissioned table based on data from the 2001 Census of Population to explore differentials in migration by ethnic group and occupational class. Employing an area classification based on the minority ethnic population and international and internal migration history of districts in England and Wales, it is hypothesised that those most likely to migrate from 'immigrant settlement areas' are those with the greatest economic resources. It is suggested that if migration does vary by level of affluence then a social gradient may be apparent with respect to migration propensity and occupational class membership. Furthermore, if such 'affluent flight' can explain 'racial' migration patterns, then a similar social gradient would be expected for each ethnic group, and a similar probability of migrating for people of common socio-demographic characteristics, irrespective of ethnic group. Three main questions relating to these themes were proposed, namely, does a social gradient exist for the residential mobility of those who live in settlement areas of England and Wales?; is a social gradient associated with moves away from settlement areas and in particular towards other areas to which minorities have dispersed?; is the social gradient, such as it exists, similar for each ethnic group? Clear evidence is presented for a social gradient with respect to movement from settlement areas. It was found that for those who originated in settlement districts, the probability of moving was greater if in higher than lower occupational classes. In addition, migrants were more likely to move outside their own (settlement) district, and to a non-settlement district, if in professional forms of employment. London was shown to have a distinct pattern of migration. London professionals were less likely to move to a non-settlement district than those in less skilled employment.

Keywords: migration, ethnicity, immigrant settlement areas, social class, England and Wales, logistic regression.

Introduction and background

Immigration to Britain and to other countries tends to focus on particular 'concentrations', 'gateway cities', 'ports of entry' (Frey 1994, 1995; Musterd and Andersson 2005; Liaw and Frey 2007), or what this paper calls 'immigrant settlement areas' which, because of their employment and housing structure, both demand and attract relatively many immigrants. Over time, some of those immigrants and their descendants leave those settlement areas, for a variety of reasons. Evidence from successive British censuses shows that minorities with origins in immigration in the second half of the 20th Century move away from the areas where concentrations of their respective ethnic group are greatest (Hussain and Stillwell 2008; Simpson *et al.* 2008; Simpson and Finney 2009).

The nature of dispersal from settlement areas is understood in demographic outline. To some extent it is simply a logical consequence of the initial concentration in settlement areas: if there is any migration at all, some of it will be to other areas. For decades, spatial assimilation research has been concerned with the geographic and social mobility of immigrants and their descendents over time (Massey 1986; Alba *et al.* 1997; Logan *et al.* 2002; Ellis and Goodwin-White 2006). Strongly embedded in this literature is the assumption that as some immigrants improve their economic position, they migrate away from their area of original settlement towards neighbourhoods with better resources and opportunities (Logan *et al.* 2002). Mobility has been shown to be very similar for each ethnic group in Britain including White; it is associated with young adults, education, and those with professional qualifications, and on balance is to suburban and rural locales (Finney and Simpson 2008; Simpson *et al.* 2008).

However, the reasons for movement from settlement areas have been disputed, and have emerged as issues in policy debate. Is there significant movement motivated by racial or cultural tension or preferences, termed variously as 'white flight' and 'self-segregation'? Has competition for jobs with immigrant workers led indigenous workers to move away, unwilling to take lower wages and poorer conditions? Alternatively, can other reasons explain the movement of each ethnic group without recourse to cultural-racial tensions or preferences? These other reasons might include the composition of each group in relation to demographic, social and economic associates of migration referred to above. Or they be attributed to the industrial restructuring of the 20th Century, during which blue collar industrial jobs of indigenous workers were lost and lower-wage service jobs gained which only immigrants were

willing to take (for related debates in the United States and Great Britain, see Frey 1995, 1996; Wright *et al.* 1997; Ellis and Wright 1998; Frey 2002; Hempstead 2002; Stillwell and Duke-Williams 2005).

This paper investigates one aspect of these debates: the existence of a 'social gradient' in the migration away from immigration settlement areas. A social gradient is defined here as a different probability of movement for those of professional socio-economic class than for those of intermediate or lower socio-economic class. It may be expected that spatial mobility is likely to be greater amongst those of higher socio-economic status, a function of superior resources to migrate, and potentially greater incentives to move, or for specialised forms of employment (Owen and Green 1992; Champion and Fisher 2003; Bailey and Livingston 2005), regardless of ethnic group (Finney and Simpson 2008). The paper considers three aspects of mobility, ethnicity and socio-economic class:

- 1. Does a social gradient exist for the residential mobility of those who live in settlement areas of England and Wales?
- 2. Is a social gradient associated with moves away from settlement areas and in particular towards other areas to which minorities have dispersed?
- 3. Is the social gradient, such as it exists, similar for White and minority ethnic groups?

These questions are addressed using data from a commissioned table based on outputs from the 2001 Census of Population, and these are introduced prior to the presentation of results. The findings are then summarised and interpreted in the context of differential migration by occupational class and ethnicity.

Data and methodology

The Censuses of Population of Great Britain in 2001 included questions for ethnic group, social class and internal migration. Census microdata which are suitable for statistical modelling record the destination of movement but not the origin. Standard tabulated data record migration between all pairs of zones, but with only one demographic, ethnicity or social variable in each table. For the present research a table was commissioned from the Office for National Statistics (ONS, Table C0772) which has relevant socio-demographic detail, which was used as microdata in statistical modelling by weighting each cell of the table by the count of residents in that cell. In order to pass the data disclosure limitations imposed on the specification of new census tables, the 376 districts of England and Wales were classified to represent immigrant settlement areas and other types of area. This section describes that classification, the other variables in the analysis, and the logistic modelling used to answer the questions posed in this paper.

Table I and Figure 1 show the area types, their definition using the flows of past minority immigration and recent minority internal migration recorded in censuses, and some descriptive statistics. 45 districts were designated 'settlement' districts for their large non-White immigration in 1961-71 and 1990-1991. 139 other districts which had significant non-White in-migration in 2000-2001 were identified with minority dispersal, and divided into those contiguous with settlement districts and those further

from them. All remaining districts were labelled as 'other'. The special tabulation commissioned from the ONS provided counts of migrants between the district types during the twelve months before the census, from other parts of the UK and from overseas. Each count is disaggregated by age, gender, birthplace, National Statistics Socio-economic Classification (NSSeC), and ethnic group (Appendix A fully specifies the table, with a list of the districts in each area type). Four NSSeC classes are referred to in this paper, namely (1) Higher managerial and professional, (2) Lower managerial and professional, (3) Intermediate, (4) Lower. Those who are under 16, over 74, students and retirees have been excluded from the analyses. The commissioned table shows, for example, how many people in a given age and ethnic group moved from a settlement district to a contiguous dispersal district.

District type (N)	Criteria	Example districts	Summary statistics (2001)
Settlement (45)	Top 40 districts for non-White immigration 1961-1971 or top 40 districts for non-White immigration 1990- 1991).	Cardiff Leicester Tower Hamlets Westminster Ealing Camden	Total pop. = 12,474,681 % White = 74.8 % Non-White = 25.2
Contiguous dispersal (35)	Districts that are not settlement districts, that had net non-White in-migration 2000- 2001 >= 20 and share a boundary with one or more settlement districts.	Newport Oadby and Wigston Warwick Havering Epsom and Ewell Bexley	Total pop. = 4,641,398 % White = 94.3 % Non-White = 5.7
Non-contiguous dispersal (104)	Districts that are not settlement districts, that had net non-White in-migration 2000- 2001 >= 20 and does not share a boundary with a settlement district	Reading Lancaster Richmond upon Thames Guildford Chiltern	Total pop. = 13,182,903 % White = 96.4 % Non-White = 3.6
Other (192)	Districts that are neither settlement nor dispersal districts	Rochdale Ipswich Bracknell Forest UA Tandridge St Albans	Total pop. = 21,743,066 % White = 97.0 % Non-White = 3.0 Mean pop. (376 districts) = 138,410

Source: Commissioned Table C0772.

Table I. Area classifications employed and example districts.



Figure 1. Districts of England and Wales according to area classification.

The paper uses the commissioned table described above to study those who lived in settlement districts in 2000, one year before the Census. Residents from other types of district have been excluded from the analyses. The 45 settlement districts included 3.1m of the 4.5m non-white minority residents of England and Wales in the 2001

Census, 71% of New Commonwealth immigration to England and Wales in 1961-1971, 64% of non-White immigration in 1990-1991, and 56% of non-White immigration in 2000-01. During the year before the 2001 census there was a great deal of movement across the borders of settlement districts. For the non-White minorities as a whole, there was a net out-movement from settlement districts of 9,600 to other parts of the UK. Among those working and therefore with socio-economic class recorded, 23,000 left settlement districts for other types of District (somewhat balanced by movement in the other direction), 16,000 of these to areas categorised as dispersal districts.

The ethnic group and socio-economic class dimensions of migration within and beyond settlement districts are explored below first with cross-tabulations and then using binomial logistic regression to measure the social gradient of migration of various types.

A logistic regression model predicts the log-odds of migration dependent on demographic and social characteristics X_i as (Rogerson 2006):

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \underline{\beta}\underline{X}, \text{ where}$$

$$y = \text{Binomial}(\pi)$$
(1)

y is observed as a 0/1 indicator, which is 1 if a move has occurred, with probability π . The estimated parameters $\underline{\hat{\beta}}$ represent the expected log(odds) of migration, which can be exponentiated and presented as odds, or more usefully transformed back to the expected *probability* of migration $\hat{\pi}$, for example for each of the socio-economic classes. This probability depends on specific values of X, the independent variables in the prediction: gender, age, birthplace, ethnicity, socio-economic class, and the interaction between gender and age.

Labelling the expected probability of migration for each of the four socio-economic classes listed above as $\hat{\pi}_1 \dots \hat{\pi}_4$, the social gradient is presented in this paper as the difference between the means of the probability of moving for the professional classes and the intermediate/lower classes, standardised by the mean probability for all four classes, $[(\hat{\pi}_1 + \hat{\pi}_2)/2 - (\hat{\pi}_3 + \hat{\pi}_4)/2]/[\text{mean}(\hat{\pi}_1 \dots \hat{\pi}_4)]$. The higher the value, the more that professional socio-economic classes have a greater likelihood of moving than other classes. The standardisation allows the comparison to be made between types of move and between ethnic groups' moves whose overall probability varies from one to another. In the results section this ratio is multiplied by 100, and ranges from +89.6% to -19.8%.

The first of the logistic regression models assesses the likelihood of moving at all, for all those who lived in a settlement district in 2000. The four other models examine the behaviour of migrants only, omitting non-movers. The second model estimates the propensity of movers to migrate beyond their original settlement district including, potentially, to another settlement district, rather than moving within their current settlement district. The third model explores, for those who have moved out of their own settlement district, the odds of moving away from settlement districts altogether rather than to another settlement district. Model four estimates beyond contiguous dispersal districts (see Table I) rather than to them, while the final model assesses migration to a district that was neither settlement nor dispersal, rather than a noncontiguous dispersal district. Each model uses a subset of the data used in the previous

model. Table II details each of the four models in summary form.

Model	Population	N (Proportion of total)
1: Move vs no move	All individuals resident in a settlement district in 2000	5,902,550 (100%)
2: Move outside own district vs move within own district	Movers resident in a settlement district in 2000, excluding non-movers	828,405 (14.03%)
3: Move to non-settlement district vs move to another settlement district	Individuals who migrated from their own settlement district, excluding non- movers and those who moved within a settlement district	423,547 (7.18%)
4: Move beyond a contiguous dispersal district vs move to a contiguous dispersal district	Only individuals who migrated from settlement districts, excluding non- movers, those who moved within a settlement district and those who moved to another settlement district	216,326 (3.66%)

In each model, the population is restricted to those in work, who have socio-economic class recorded, (i.e., those in work), and the population size is summed over all ethnic groups.

Table II. Model specifications.

Variables included in each logistic regression model were age, gender, birthplace, NSSeC and ethnic group. Testing indicated that the interaction effect between age and sex was important, and so this has been included in all four logistic regression models. The four models were generated for each of the ethnic groups separately to provide a separate set of coefficients for each group, as a single model incorporating all interactions would have been very complex to interpret, but provide little extra information given that the 'sample' size is very large for each group. The sample is the whole population recorded in the Census. In addition, a non-White group was constructed, which included all ethnic groups apart from White, and the same models estimated for it.

In the following section, the coefficients for NSSeC are highlighted for each ethnic group. For Model 1, the odds are shown as preliminary to the probabilities: if greater than 1, the odds of moving are higher for individuals in the indicated category compared to the reference category. The reverse is true for values less than 1. For other models, only the probabilities of moving are shown, being more straightforward to interpret. In each case, the odds and probabilities are those of a person with reference characteristics: male aged 30-74, born in the UK, ethnic group White, NSSeC Lower.

Our expectation is that professionally occupied residents of all ethnic groups will be more likely to move, and more likely to move further from settlement areas, than those with other jobs. This positive social gradient would be similar for each ethnic group, if it were a simple matter that professional jobs pay better, and that more pay better achieves housing aspirations to live in suburban settings which are common to all groups. Different social gradients for each ethnic group might suggest that different processes encourage or discourage migration for each group, and that the nature of the settlement areas and other areas have different attraction for residents of each ethnic group. The potential sources of such differences as are found will be discussed but cannot be firmly explained by the modelling processes of this paper, which are suited to establishing whether significant patterns exist.

Assessing major trends in migration by ethnic group and NSSeC

Tables III and IV indicate the proportion of individuals from settlement districts who moved, either within their own district, to a different settlement district, or to each other type of district.

There is strong evidence that those in higher occupational classes are more likely to move than those in lower occupational classes. From Table III, of those in higher managerial and professional occupations, a clearly larger proportion have migrated (18.8%) compared to those in the lower managerial and professional class (16.2% migrated). There is evidence of a social gradient in that the proportion of those in the lower managerial and professional class who have migrated is greater than those in the intermediate class (12.8% migrated), and the proportion of those in the intermediate class who migrated is greater than those in the lower NSSeC class who migrated (11.4%).

Table III indicates that most moves are of short distance. This is shown by the large proportion of moves within settlement districts. For those migrating between settlement districts, this is often over the boundary of adjacent districts; a move type accounting for many between settlement district migrations in London. There are fewer moves from settlement districts to other kinds of districts, although these still represent about one fifth of the total moves. The percentage of movers by NSSeC group suggests a notable social gradient for all move types, with the exception of within settlement moves.

		Non-movers	Movers	Within settlement	Settlement to settlement	Settlement to contiguous dispersal	Settlement to non-contiguous dispersal	Settlement to other	Total = 100%
Higher managerial and professional	% within NSSeC	81.2%	18.8%	7.3%	6.2%	1.3%	2.0%	2.1%	816408
Lower managerial and professional	% within NSSeC	83.8%	16.2%	7.0%	4.8%	1.2%	1.5%	1.8%	1621047
Intermediate	% within NSSeC	87.2%	12.8%	6.2%	3.0%	1.0%	1.1%	1.4%	1305413
Lower	% within NSSeC	88.6%	11.4%	7.0%	1.8%	0.7%	0.8%	1.1%	2159682
Total	% within NSSeC	86.0%	14.0%	6.9%	3.5%	0.9%	1.2%	1.5%	5902550

Source: Census 2001, Table C0772. All employed aged 16-74, residents of settlement districts.

Note: Higher managerial and professional = NSSeC 1.1 and 1.2; Lower managerial and professional = NSSec 2; Intermediate = NSSeC 3 and 4; Lower = NSSeC 5, 6 and 7.

 Table III. Migration by occupational class, for individuals who originated in a settlement district.

Table IV shows migrants and non-migrants who resided in settlement districts, this time disaggregated by both occupational status and a binary division of the population based on ethnic group. The White/non-White division masks much variation, and this is explored in more depth later in the paper. Cross tabulations of ethnic group and move type alone suggest higher rates for members of the White group than other ethnic groups (see 'total' row, Table IV). For both the White and collective non-White groups, the propensity to migrate tends to be greater for those in higher occupational classes than those in lower occupational classes. Within occupational classes, migration propensities are greater for members of the White group than for members of the other ethnic groups. For every NSSeC class, the White percentage moving and the White percentage in each destination is higher than the equivalent non-White

percentage, with only two exceptions. These exceptions are lower NSSeC moves within settlement and settlement to settlement.

			Non-movers in settlement	Within settlement	Settlement to settlement	Settlement to contiguous dispersal	Settlement to non-contiguous dispersal	Settlement to other	Total = 100%
White	Higher managerial and professional	% within NSSeC	80.7%	7.4%	6.3%	1.3%	2.1%	2.3%	660738
	Lower managerial and professional	% within NSSeC	83.1%	7.2%	4.8%	1.2%	1.6%	2.0%	1335925
	Intermediate	% within NSSeC	86.7%	6.3%	2.9%	1.1%	1.3%	1.7%	1018018
	Lower	% within NSSeC	88.6%	6.9%	1.5%	0.7%	0.9%	1.3%	1672044
	Total	% within NSSeC	85.5%	6.9%	3.4%	1.0%	1.3%	1.8%	4686725
hite	Higher managerial and professional	% within NSSeC	83.2%	6.9%	6.0%	1.1%	1.5%	1.2%	155670
M-nc	Lower managerial and professional	% within NSSeC	86.9%	6.3%	4.8%	0.8%	0.7%	0.5%	285122
č	Intermediate	% within NSSeC	89.0%	5.9%	3.4%	0.6%	0.6%	0.5%	287395
	Lower	% within NSSeC	88.7%	7.2%	2.9%	0.4%	0.5%	0.4%	487638
	Total	% within NSSeC	87.6%	6.6%	3.9%	0.6%	0.7%	0.6%	1215825

Source: Census 2001, Table C0772. All employed aged 16-74, residents of settlement districts. **Note:** Higher managerial and professional = NSSeC 1.1 and 1.2; Lower managerial and professional = NSSec 2; Intermediate = NSSeC 3 and 4; Lower = NSSeC 5, 6 and 7.

Table IV. Migration by occupational status and ethnic group (White/non-White), for individuals who originated in a settlement district.

Modelling migration probabilities

A way of interrogating the data and assessing the magnitude and nature of differences between each ethnic group, in terms of their probability of migration, while taking into account their socio-economic class and other characteristics is offered by a logistic regression modelling framework. The models are described in Section 2, and the full results from each appear in Appendices B and C. The numbers of individuals in each ethnic group for each model are shown in Table V. The other variables in each regression are not shown in this paper for reasons of space. To summarise their results for Model 1 (move vs not move), the odds of moving are higher for younger individuals than older groups; there is minimal difference between males and females; and those born outside the UK have a higher odds of migrating than individuals born in the UK. The tables below report the odds and probabilities of moving for each NSSeC class, from models estimated for each ethnic group.

Ethnic group	Model 1	Model 2	Model 3	Model 4
White	4686725	678029	353580	193314
Mixed	96704	17198	8741	3387
Indian	355710	34656	16819	6074
Pakistani	144825	18087	5456	1881
Bangladeshi	53973	6655	2238	719
Caribbean	223964	21992	9625	2668
African	149520	24052	12651	3598
Chinese	42565	6195	3862	1524
Other	148564	21541	10575	3161
Non-White	1215825	150376	69967	23012
Total	5902550	828405	423547	216326
population				

Table V. Numbers of individuals in each ethnic group for Models 1-4.

The first logistic regression models the probability of moving rather than not moving, regardless of the destination. The exponential of beta for Model 1 (the odds) is shown in Table VI. It is clear that for nearly every ethnic group, the odds of moving are lower for lower NSSeC classes. That is, movement is more likely if an individual is in a higher or lower professional or managerial role than in the Lower NSSeC category. This is so *after* taking into account the impact of age, sex and birthplace for each ethnic group, which is the advantage of the regression approach over the earlier tabulations.

Ethnic group

cupational ass	White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other	Non-White
gher anagerial id ofessional	1.935	1.515	2.279	1.434	1.334	1.449	1.211	1.689	1.334	1.624
wer anagerial Id ofessional	1.615	1.306	1.44	1.126	0.978	1.173	1.112	1.214	1.066	1.244
ermediate	1.236	1.049	1.079	0.91	0.955	1.03	0.964	1.213	0.926	0.991
wer	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
anagerial d ofessional wer anagerial d ofessional termediate	1.615 1.236 1.000	1.306 1.049 1.000	1.44 1.079 1.000	1.126 0.91 1.000	0.978 0.955 1.000	1.173 1.03 1.000	1.112 0.964 1.000	1.214 1.213 1.000	1.066 0.926 1.000	1.24 0.99 1.00

Reference category= NSSeC Lower, male, 30-74, born in UK.

Table VI. Modelled odds ratios for Model 1: Move vs no move.

Consistent for all groups is the fact that those in higher managerial and professional occupations have greater odds of moving than those in the lowest NSSeC class, as is the case for those in lower managerial and professional occupations. The largest differences in the coefficients for different NSSeC classes are for the Indian group. To better interpret these differences, the probabilities of migration are derived from the odds, and are the focus of the remainder of the section.

The probabilities of migrating for those who were resident in a settlement district in 2000 have been calculated for individuals in each NSSeC and ethnic group, and are shown in Table VII and Figure 2. Individuals in higher professional jobs have a higher probability of moving than those in the lower NSSeC class. For most ethnic groups, the probability of moving is lower for those in the lower professional and managerial category than those in the higher category, but higher than for individuals in the intermediate NSSeC classes. This pattern is apparent for most ethnic groups (including

the non-White group when treated as a single category) but most clearly so for the White and Indian groups. For the White group, for example, the probability of moving if in the higher managerial or professional group is 0.13 (or 13%), whereas this decreases to 0.11, 0.09 and 0.07 for the lower managerial and professional, intermediate and lower classes, respectively.

Ethnic group										
Occupational class	White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other	Non-White
Higher managerial	0.13	0.15	0.11	0.12	0.13	0.12	0.15	0.14	0.11	0.13
Lower managerial and professional	0.11	0.13	0.07	0.09	0.10	0.10	0.14	0.11	0.09	0.10
Intermediate	0.09	0.11	0.06	0.08	0.10	0.09	0.13	0.11	0.08	0.08
Lower	0.07	0.10	0.05	0.09	0.10	0.09	0.13	0.09	0.09	0.08
	D 0		2100		1 0					

Reference category= NSSeC Lower, male, 30-74, born in UK.

Table VII. Probabilities for Model 1: Move vs no move.



Figure 2. Graphed probabilities for Model 1: Move vs no move.

Thus, while each ethnic group may have a higher or lower probability of migrating within the same NSSeC category (see Finney and Simpson 2008, for a discussion of these differences), all groups are behaving in approximately similar ways, with the hypothesised social gradient. Taking NSSeC classes as a proxy for income, it is not surprising that migration will be higher amongst those in the managerial and professional classes than in intermediate and lower. Migration is not possible without the economic means to move, and therefore (perhaps with the exception of low income families privately renting) those who are more affluent will be more likely to do so. Another potential explanation is that those in the professional and managerial categories may be more likely to move for highly skilled employment.

Non-movers have been excluded from Model 2 to predict the probability of an individual migrating out of their settlement district, rather than within it (see Figure 3). Therefore, for this model, higher values refer to increased probabilities of moving outside the district of origin. Once again, a gradient of movement is visible, with higher probabilities for those in the higher NSSeC classes. Steepness of the gradients can be compared by taking the mean of the probabilities for the Higher and Lower professional classes and subtracting this from the mean of the Intermediate and Lower classes and then dividing the product by the average of all the probabilities for a given ethnic group (as explained in the section on methods above; see Table VIII). The groups with the steeper gradient for Model 1 than Model 2 were the White, Indian and Chinese groups. The groups with a less steep gradient for Model 1 than Model 2 include the Pakistani and Bangladeshis.



Figure 3. Graphed probabilities for Model 2: Move outside own district vs move within own district.

Model	White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other	Non-White
1	41.13	27.87	52.31	26.28	14.74	22.85	14.41	23.84	19.77	32.47
2	26.86	27.88	31.04	53.73	39.04	25.91	15.54	3.60	19.69	29.70
3	-18.52	-5.37	8.04	-3.59	-9.41	0.02	15.87	-19.83	17.48	4.94
1*2*3	48.91	50.65	89.60	79.19	47.46	49.30	46.30	9.04	57.80	67.42
4	1.87	6.06	7.03	-11.02	-1.96	3.96	7.95	6.95	-2.15	2.41

Note: For model specifications see Table II.

Table VIII. NSSeC gradients for all models.

For the Chinese group in Model 2, individuals have a consistently high probability of migrating out of their district of origin, irrespective of NSSeC class (Figure 3). For those classified as higher managerial and professional and Chinese, the probability of migrating is similar to most other ethnic groups, yet while this probability of migrating reduces for these other ethnic groups for other NSSeC classes, the probabilities are similar between occupational classes in the case of the Chinese

group. Finney and Simpson (2008) have demonstrated that the Chinese group has the smallest proportion of short distance moves of any ethnic group, likely in part due to their more dispersed population structure, and this is consistent with the findings presented here. The Pakistani group exhibits consistently lower probabilities of migration over the District boundary for all NSSeC classes with respect to the other ethnic groups. For the Pakistani group, the gradient is steep between the four main occupational classes, and steeper than for the Pakistani probabilities in the previous model (see Table VIII).

Probabilities in Model 3 refer to migration to a non-settlement district, as opposed to migration to another settlement district, and these are shown in Figure 4. The probabilities for this model show a rather different pattern than in previous models. Unlike in Models 1 and 2, for those in the lower NSSeC class, the probability of migrating is either similar or slightly under the probability of migrating for the higher managerial and professional class, for all ethnic groups apart from the White group. For those in the White ethnic category, and in the lower NSSeC class, the probability of migration to a non-settlement district is higher when compared to professionals in the White group, and also when compared to non-professionals in the other ethnic groups. A higher probability of making this type of move for lower NSSeC classes than higher professionals is also the case for the Mixed and Chinese groups. For other groups, the difference between NSSeC classes is small compared to previous models.



Figure 4. Graphed probabilities for Model 3: Move to non-settlement district vs move to another settlement district.

Despite evidence of a social gradient in Model 1 and Model 2, ethnic groups were not consistently similar across all four models, and Model 3, in particular, revealed a marked difference between groups. In this model of migration to a non-settlement district versus moves to another settlement district, a negative social gradient for the White group shows an increasingly high probability of moving to a non-settlement district for lower NSSeC categories. In isolation, these results may be seen as supportive of the White flight hypothesis, with those in the White group in lower income brackets moving away from areas of high immigration and ethnic minority populations, to non-settlement area destinations. However, it should be remembered that this model shows the probability of moving to a non-settlement district *only* if an individual moved and *only* if they moved outside their district of origin. If we model the whole population who lived in settlement areas in 2000, rather than this subset, a rather different picture is revealed. The results in Figure 5 show the probability of moving to a non-settlement district for any individual who lived in a settlement

district (computed by multiplying the probabilities from the three models: that is, Model 1*Model 2*Model 3). The results from Models 1*2*3 are potentially most significant for the research questions posed as this model allows us to examine who has a higher probability of migrating away from settlement districts altogether. If hypotheses of self-segregation and White flight are applicable, then it would be expected that those in the White category would be more likely to leave settlement districts, given their higher minority ethnic proportions, and that those in other groups would be more likely to stay. However, the results suggest a lower probability of moving to a non-settlement district if in the Lower NSSeC class, for all ethnic groups. This raises interesting questions about why these Models 3 and Models 1*2*3 may differ in what they suggest in terms of social gradients of movement.



Figure 5. Graphed probabilities for Model 1*2*3: Move to non-settlement district.

Much of the explanation for this difference comes from the effect of London in the dataset. When Model 3 is estimated for settlement districts in London separately from

those outside of London, the most pronounced reverse social gradients are for London (see Figure 6a and 6b). Less affluent Whites in a settlement district in London were more likely to move to a non-settlement district than were Whites in higher NSSeC classes.



(a)



(b)

Figure 6. Graphed probabilities for Model 3: Move to non-settlement district vs move to another settlement district for (a) non-London and (b) London settlement districts.

The financial and commercial role of London and the specialised forms of employment offered in the capital might be expected to lead to distinctive migration patterns when compared to other UK cities. Professionals working in London are more likely to be able to afford to remain in central, gentrified locations and to avoid a possibly lengthy commute. The traditional counterurban flow of professionals observed elsewhere may therefore be reversed in the case of London. This is in line with the findings of Butler *et al.* (2008), who argued that inner London has seen an increase of residents in the highest NSSeC classes between 1981 and 2001. This gain by London is in contrast to other UK cities, as also highlighted by Champion and Fisher (2003) and Champion and Coombes (2007). London house prices are particularly high, such that those with professional jobs are more likely to be able to remain in London to reduce their travel to work and to take advantage of London's social and cultural attractions.

Model 4 (Figure 7) provides information on the probability of migrating to a noncontiguous dispersal or 'other' district, as opposed to a contiguous dispersal district, for those who moved away from settlement districts. The probability of migrating beyond a contiguous district is high, for all occupational classes, for migrants in all ethnic categories. The highest probabilities for the Bangladeshi group, and the lowest probabilities for the African group. Compared to previous models, there is little difference between occupational classes and less social gradient.



Figure 7. Graphed probabilities for Model 4: Move beyond a contiguous dispersal district vs move to a contiguous dispersal district.

Summary and conclusions

Using a commissioned table based on data from the 2001 Census of Population, the analysis presented in this paper explored differentials in migration by ethnic group and occupational class. Employing an area classification based on the minority ethnic population and international and internal migration history of districts in England and Wales, it was hypothesised that differences in the propensity to migrate away from settlement districts would be distinguishable by occupational class. It was suggested that if migration did vary by level of affluence then a social gradient may be apparent with respect to migration propensity and NSSeC class membership. Further to this, if such 'affluent flight' can explain 'racial' migration patterns, then a similar social gradient would be expected for each ethnic group, and a similar probability of migrating for people of common socio-demographic characteristics, irrespective of ethnic group. Three main questions relating to mobility, ethnicity and socio-economic

class were proposed, namely, does a social gradient exist for the residential mobility of those who live in settlement areas of England and Wales?; is a social gradient associated with moves away from settlement areas and in particular towards other areas to which minorities have dispersed?; and is the social gradient, such as it exists, similar for each ethnic group?

While area classifications such as the scheme presented here provide a useful basis for exploring population movement, what have been categorised as settlement areas may have very different meanings for different groups. Many settlement districts identified include large cities with a dominant economic role regionally, large student populations and hubs for services, leisure and commerce. Aside from these attractors, it should also be remembered that these areas are where people have set up their homes, formed familial unions, and perhaps become involved in the local community. For many minority residents the settlement area is by definition a 'comfort zone' of childhood and familiarity. While leaving may be possible, it is not always preferable, or even a consideration. Likewise, districts are an artificial construction, and vary greatly in their size and shape, and any results derived using data for these areas are in part a function of this. Future work could consider alternative geographies. Work with the next Census will reflect, for example, the increase of immigration to Britain from Eastern European countries.

The modelling has shown that both ethnic group and NSSeC are highly associated with migration patterns. The effect of removing either ethnic group or NSSeC on model fit has been explored (the results are not reported due to constraints of space). As would be expected, there is a poorer fit when either variable is removed, with little difference between the impact of either variable on the significance values. Questions remain regarding to what extent social class may explain differences between ethnic groups' residential mobility, and this is an important area for future work.

Building on previous research which has suggested that dispersal from areas of ethnic concentration has been a feature of recent British internal migration (Finney and Simpson 2008; Hussain and Stillwell 2008; Simpson *et al.* 2008), it is hypothesised here that those most likely to migrate from settlement areas are those with the greatest economic resources. Given previous evidence for common internal migration behaviour between groups (*ibid.*), it was hypothesised that this social gradient of migration would hold for all ethnic groups, and that it is those who can afford to do so who will disperse from settlement districts.

The paper has presented strong evidence for a social gradient for some kinds of moves, with greater probabilities of making certain residential location changes for those in more professional occupational classes. This is consistent for most ethnic groups. It was found that for those who originated in settlement districts, the probability of moving was greater if in higher than lower occupational classes. Likewise, those who migrated were more likely to move outside their own (settlement) district, and to a non-settlement district, if in more professional forms of employment. London was shown to have a distinct pattern of migration. London professionals were less likely to move to a non-settlement district than those in the Lower NSSeC class, possibly due in part to housing affordability and a reluctance to commute long distances.

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Appendix A: Census Table C0772

The table is available from Census.Commissiontables@ons.gsi.gov.uk and is accompanied by a list of all 376 local authority districts with census codes and the category used in Tables C0772 into which each falls.

Area Class	No. of districts	Non White Pop 91	Non-White Population 2001	Non- White UK Out Migration 2000- 2001	Non- White UK In Migration 2000- 2001	Non- White UK Net Migration 2000- 2001
Settlement	45	2,358,530	3,138,917	144,497	134,875	-9,622
Dispersal districts contiguous to settlement areas in London	13	85,211	140,463	8,209	12,182	3,973
Dispersal districts contiguous to settlement areas outside London	22	85,707	125,053	7,264	9,637	2,373
Dispersal Non- contiguous districts, Non-White population 5000+	28	209,651	299,707	16,457	21,039	4,582
Dispersal Non- contiguous districts, Non-White population <5000	76	112,614	174,355	13,737	18,251	4,514
Other districts Non- White population 5000+	37	307,574	407,281	18,553	16,254	-2,299
Other districts Non- White population <5000	155	159,727	235,258	20,918	18,119	-2,799
Total	376	3,319,014	4,521,034	229,635	230,357	722

Area Class	Districts
Settlement	Barnet; Birmingham; Blackburn-with-Darwen UA; Bolton; Bradford; Brent; Camden; Cardiff UA; Coventry; Croydon; Derby UA; Ealing; Enfield; Greenwich; Hackney; Hammersmith; Haringey; Harrow; Hillingdon; Hounslow; Islington; Kensington; Kingston; Kirklees; Lambeth; Leeds; Leicester UA; Lewisham; Luton UA; Manchester; Merton; Newcastle; Newham; Nottingham UA; Redbridge; Sandwell; Sheffield; Slough UA; Southwark; Tower Hamlets; Walsall; Waltham; Wandsworth; Westminster; Wolverhampton.
Dispersal districts contiguous to settlement areas in London	Barking; Bexley; Bromley; Broxbourne; Elmbridge; Epsom and Ewell; Havering; Hertsmere; Mole Valley; South Bucks; Sutton; Three Rivers; Welwyn Hatfield.
Dispersal districts contiguous to settlement areas outside London	Blaby; Bromsgrove; Broxtowe; Castle Morpeth; Charnwood; Derbyshire Dales; Gateshead; Gedling; Harborough; Hinckley; Lichfield; Newport UA; North East Derbyshire; North Tyneside; Oadby and Wigston; Rushcliffe; Salford; Solihull; South Bedfordshire; Stockport; Trafford; Warwick.
Dispersal Non- contiguous districts, Non-White population 5000+	Aylesbury; Basildon; Bournemouth UA; Brighton and Hove UA; Bristol, Chelmsford; Cherwell; Colchester; Dacorum; Epping Forest; Guildford; Medway UA; Milton Keynes UA; Northampton; Portsmouth UA; Reading UA; Reigate; Richmond; South Gloucestershire UA; Southampton UA; Swindon UA; Telford; Thurrock UA; Watford; Wellingborough; Woking; Wokingham UA; Wycombe.
Dispersal Non- contiguous districts, Non-White population <5000	St Helens; Stockton; East Riding of Yorkshire UA; York UA; Rutland UA; Bath and North East Somerset UA; North Somerset UA; Plymouth UA; Torbay UA; Poole UA; Isle of Wight UA; Wrexham UA; Pembrokeshire UA; Carmarthen UA; Bridgend UA; Chiltern; East Cambridgeshire; Huntingdonshire; South Cambridgeshire; Chester; Crewe and Nantwich; Ellesmere; Carrick; Kerrier; Copeland; Bolsover; North Dorset; Durham ; Braintree; Harlow; Maldon ; Cheltenham; East Hampshire; Gosport; Rushmoor; Winchester; East Hertfordshire; Stevenage; Ashford; Canterbury; Dartford; Sevenoaks; Shepway; Swale; Lancaster; Wyre; East Lindsey; South Holland; Kings Lynn; Norwich; Daventry; East Northamptonshire; South Northamptonshire; Wansbeck; Newark and Sherwood; South Oxfordshire; Vale of White Horse; Bridgnorth; North Shropshire; South Somerset; South Staffordshire; Stafford; Tamworth; Babergh; Forest Heath; St Edmundsbury; Waveney; Runnymede; Surrey Heath; Adur; Arun; Horsham; North Wiltshire; Worcester; Wychavon; Wyre Forest.
Other districts, Non- White population 5000+	Basingstoke and Deane; Bedford; Bracknell Forest UA; Burnley; Bury; Calderdale; Cambridge; Crawley; Doncaster; Dudley; East Staffordshire; Gloucester; Gravesham; Hyndburn; Ipswich; Kingston; Liverpool; Middlesbrough UA; North Hertfordshire; Nuneaton; Oldham; Oxford; Pendle; Peterborough UA; Preston; Rochdale; Rotherham; Rugby; Southend-on-Sea UA; Spelthorne; St Albans; Stoke-on-Trent UA; Sunderland; Tameside; Wakefield; Windsor and Maidenhead UA; Wirral.
Other districts, Non- White population <5000	155 districts.

Table C0772 cross-tabulates:

Sex (GENPUK) Male Female

Ethnic group (ETHPUK, categories amalgamated to nine):

White (White British, White Irish, White Other) Mixed (White-Caribbean, White-African, White-Asian, Other Mixed) Indian Pakistani Bangladeshi Caribbean African Chinese Other (Asian Other, Black Other, Other groups)

Country of Birth (COBPUK, categories amalgamated to two):

UK Elsewhere

Socio-economic Class of Person / Age (NSSPUK (NSSeC of Person), with AGEPUK (Age) and ECOPUK (Economic Activity) used to create thirteen categories covering the whole population):

Aged under 16* Aged 75 or over, plus all with economic activity retired ** Full time student (NSSeC L15) Aged 16-29 Higher managerial and professional (NSSeC 1.1 and 1.2) Aged 30-74 Higher managerial and professional (NSSeC 1.1 and 1.2) Aged 16-29 Lower managerial and professional (NSSeC 2) Aged 30-74 Lower managerial and professional (NSSeC 2) Aged 16-29 Intermediate (NSSeC 3 and 4) Aged 30-74 Intermediate (NSSeC 3 and 4) Aged 16-29 Lower (NSSeC 5, 6 and 7) Aged 30-74 Lower (NSSeC 5, 6 and 7) Aged 16-29 Not classified (NSSeC class 8, and Not classified L16 and L17) Aged 30-74 Not classified (NSSeC class 8, and Not classified L16 and L17)

*This category from AGE variable. **This category from AGE and ECOPUK variables. Remaining categories from NSSPUK.

Migration origin type of district (Using MIGPUK and MOAPUK (or possibly more appropriate variables which indicate whether moved within same District), 55 categories indicating whether migrant and the origin of migrants):

Usual address one year ago same as address of enumeration No usual address one year ago Migrant from within same District as address of enumeration 1 to 45 Settlement districts, individually identified

- 46 Dispersal districts contiguous to settlement areas in London
- 47 Dispersal districts contiguous to settlement areas outside London
- 48 Dispersal Non-contiguous districts, Non-White population 5000+
- 49 Dispersal Non-contiguous districts, Non-White population <5000
- 50 Other districts Non-White population 5000+
- 51 Other districts Non-White population <5000Migrant from Scotland or Northern Ireland

Migration destination type of district (i.e., area of residence at Census day 2001)

1 to 45 Settlement districts, individually identified

- 46 Dispersal districts contiguous to settlement areas in London
- 47 Dispersal districts contiguous to settlement areas outside London
- 48 Dispersal Non-contiguous districts, Non-White population 5000+
- 49 Dispersal Non-contiguous districts, Non-White population <5000
- 50 Other districts Non-White population 5000+
- 51 Other districts Non-White population <5000

Appendix B: Exp(B) and significance for Models 1 to 4

Model 1

		Ethnic gro	oup							
		White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other
Step 1(a)	Sex(1)	0.927***	0.859***	0.96**	0.971	0.815***	0.806***	0.81***	1.061	0.783***
. ,	age(1)	3.557***	2.278***	2.401***	1.778***	1.384***	1.917***	2.074***	2.538***	2.382***
	NSSeC(1)	1.935***	1.515***	2.268***	1.431***	1.353***	1.449***	1.211***	1.699***	1.334***
	NSSeC(2)	1.615***	1.306***	1.438***	1.127***	0.987	1.173***	1.112***	1.213***	1.066***
	NSSeC(3)	1.236***	1.049*	1.079***	0.91***	0.962	1.03	0.964	1.214***	0.926***
	Birthplace(1)	1.446***	1.341***	1.088***	1.077***	1.11**	0.867***	1.104***	1.04	1.532***
	Sex(1) by age(1)	1.261***	1.416***	1.359***	1.339***	1.671***	1.544***	1.196***	1.184**	1.281***
	Constant	0.076***	0.114***	0.056***	0.094***	0.1***	0.095***	0.151***	0.09***	0.096***
Step 2(a)	age(1)			2.442***	1.793***	1.356***			2.5***	
	NSSeC(1)			2.279***	1.434***	1.334***			1.697***	
	NSSeC(2)			1.44***	1.126***	0.978			1.21***	
	NSSeC(3)			1.079***	0.91***	0.955			1.213***	
	Birthplace(1)			1.089***	1.079***					
	Sex(1) by age(1)			1.306***	1.3***	1.668***			1.186**	
	Constant			0.055***	0.093***	0.111***			0.094***	
	Sex(1)					0.809***			1.062	
Step 3(a)	age(1)								2.428***	
	NSSeC(1)								1.689***	
	NSSeC(2)								1.214***	
	NSSeC(3)								1.213***	
	Sex(1) by age(1)								1.258***	
	Constant								0.097***	

*** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level

Note: Sex(1)=Female; Age(1)=16-29; Birthplace(1)=Born outside UK; NSSeC(1)=Higher managerial and professional; NSSeC(2)=Lower managerial and professional; NSSeC(3)=Intermediate. Reference category= NSSeC Lower, male, 30-74, born in UK.

		Ethnic gro	bup							
		White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other
Step 1(a)	Sex(1)	0.96***	0.87**	1.141***	1.097	0.969	0.755***	0.868***	1.132	1.17***
	age(1)	1.124***	1.192***	1.235***	0.872**	1.163*	1.158***	1.147***	1.267**	1.238***
	NSSeC(1)	2.473***	2.359***	2.751***	3.664***	3.205***	2.328***	1.627***	1.308***	2.064***
	NSSeC(2)	2.111***	1.954***	2.12***	2.686***	2.204***	1.756***	1.25***	1.228**	1.527***
	NSSeC(3)	1.721***	1.534***	1.703***	1.697***	1.662***	1.456***	1.041	1.312***	1.417***
	Birthplace(1)	1.397***	1.426***	0.806***	0.821***	0.745***	1.048	0.918**	0.918	1.063
	Sex(1) by age(1)	0.979*	1.015	0.965	0.982	0.816	1.043	0.987	0.951	0.827***
	Constant	0.594***	0.582***	0.527***	0.302***	0.444***	0.599***	1.052	1.241*	0.606***
Step 2(a)	Sex(1)	0.949***	0.878***	1.122***	1.085*		0.766***	0.865***	1.107	1.166***
	age(1)	1.112***	1.201***	1.214***	0.866***	1.169*	1.186***	1.139***	1.233***	1.228***
	NSSeC(1)	2.473***	2.36***	2.751***	3.664***	3.203***	2.327***	1.626***	1.308***	2.06***
	NSSeC(2)	2.111***	1.954***	2.119***	2.686***	2.2***	1.754***	1.25***	1.228**	1.524***
	NSSeC(3)	1.721***	1.534***	1.702***	1.696***	1.661***	1.456***	1.041	1.31***	1.414***
	Birthplace(1)	1.397***	1.426***	0.807***	0.821***	0.746***	1.049	0.918**	0.917	
	Constant	0.597***	0.579***	0.53***	0.303***	0.441***	0.595***	1.055	1.256*	0.64***
	Sex(1) by age(1)					0.791***				0.823***
Step 3(a)	age(1)				0.876***		1.176***	1.153***	1.269***	1.128***
	NSSeC(1)				3.63***	3.173***	2.31***	1.653***	1.31***	2.047***
	NSSeC(2)				2.704***	2.184***	1.743***	1.26***	1.237**	1.518***
	NSSeC(3)				1.703***	1.642***	1.449***	1.051	1.315***	1.402***
	Birthplace(1)				0.806***	0.731***				
	Constant				0.314***	0.483***	0.609***	0.976	1.16*	0.663***
	Sex(1) by age(1)					0.86*				
	Sex(1)						0.766***	0.866***	1.103	1.077**
Step 4(a)	NSSeC(1)				3.727***	3.231***			1.293***	2.04***
	NSSeC(2)				2.761***	2.171***			1.241**	1.529***
	NSSeC(3)				1.735***	1.624***			1.32***	1.415***
	Birthplace(1)				0.846***	0.761***				
	Constant				0.28***	0.447***			1.222***	0.681***
	age(1)								1.275***	1.134***
Step 5(a)	age(1)								1.293***	
	Constant								1.477***	

*** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level

Note: Sex(1)=Female; Age(1)=16-29; Birthplace(1)=Born outside UK; NSSeC(1)=Higher managerial and professional; NSSeC(2)=Lower managerial and professional; NSSeC(3)=Intermediate. Reference category= NSSeC Lower, male, 30-74, born in UK.

Model 3

		Ethnic gro	oup							
		White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other
Step 1(a)	Sex(1)	1.127***	0.873	0.952	0.983	0.587*	0.726***	0.945	0.777**	0.985
	age(1)	0.604***	0.82**	0.682***	0.975	1.297*	1.285***	0.866*	0.65***	0.879*
	NSSeC(1)	0.462***	0.969	1.427***	1.059	1.126	1.133	1.476***	0.879	1.801***
	NSSeC(2)	0.509***	0.749***	0.94	0.633***	0.763*	0.925	1.085	0.58***	1.225***
	NSSeC(3)	0.711***	0.904	1.035	0.807**	1.217	1.051	1.064	1.076	1.32***
	Birthplace(1)	0.293***	0.505***	0.853***	0.703***	0.872	0.85***	0.849***	0.909	0.991
	Sex(1) by age(1)	0.885***	0.924	0.926	0.792	0.773	0.746**	0.843*	1.132	0.79**
	Constant	3.064***	1.136*	0.703***	0.79**	0.569***	0.457***	0.447***	1.099	0.373***
Step 2(a)	Sex(1)		0.834***			0.483***	0.715***		0.822**	0.986
	age(1)		0.789***	0.697***	0.98	1.23*	1.285***	0.887*	0.694***	0.881*
	NSSeC(1)		0.97	1.432***	1.06	1.133		1.484***	0.881	1.802***
	NSSeC(2)		0.749***	0.939	0.632***	0.768*		1.08	0.581***	1.226***
	NSSeC(3)		0.905	1.034	0.807**	1.221		1.06	1.082	1.321***
	Birthplace(1)		0.504***	0.855***	0.704***	0.874	0.847***	0.851***	0.911	
	Constant		1.16**	0.687***	0.785**	0.583***	0.462***	0.436***	1.063	0.37***
	Sex(1) by age(1)			0.883**	0.778**		0.753**	0.797***		0.79**
Step 3(a)	age(1)			0.654***		1.26*	1.117*		0.717***	0.886*
	NSSeC(1)			1.446***	1.062	1.158		1.493***	0.882	1.803***
	NSSeC(2)			0.935	0.634***	0.787		1.09	0.586***	1.225***
	NSSeC(3)			1.027	0.809**	1.237		1.07	1.086	1.321***
	Birthplace(1)			0.861***	0.708***		0.842***	0.862***		
	Constant			0.683***	0.775***	0.51***	0.485***	0.419***	0.977	0.368***
	Sex(1) by age(1)				0.77***			0.726***		0.779***
	Sex(1)					0.492***	0.646***		0.818**	
Step 4(a)	NSSeC(1)				1.101	1.139		1.532***	0.905	1.807***
	NSSeC(2)				0.641***	0.78		1.106*	0.583***	1.237***
	NSSeC(3)				0.805**	1.209		1.084	1.076	1.339***
	Birthplace(1)				0.761***		0.832***			
	Constant				0.691***	0.579***	0.504***	0.369***	0.878	0.354***
	Sex(1)					0.529***	0.651***			
	Sex(1) by age(1)							0.736***		0.713***
	age(1)								0.71***	
Step 5(a)	Sex(1)					0.523***	0.651***			
	Constant					0.589***	0.475***	l		

*** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates

significance at the 0.05 level Note: Sex(1)=Female; Age(1)=16-29; Birthplace(1)=Born outside UK; NSSeC(1)=Higher managerial and professional; NSSeC(2)=Lower managerial and professional; NSSeC(3)=Intermediate. Reference category= NSSeC Lower, male, 30-74, born in UK.

Model 4

		Ethnic gro	oup							
		White	Mixed	Indian	Pakistani	Bangladeshi	Caribbean	African	Chinese	Other
Step 1(a)	Sex(1)	1.04**	0.993	0.947	0.947	0.269***	0.76**	0.897	1.018	1.141
	age(1)	1.041**	0.917	1.212*	1.654***	1.364	1.711***	1.525***	1.607*	1,172
	NSSeC(1)	1.133***	1.255*	1.586***	0.677**	0.875	1.359*	1.157	1.349	0.902
	NSSeC(2)	0.988	1.056	0.915	0.389***	0.687	0.741**	0.826*	0.839	0.748**
	NSSeC(3)	0.955**	0.858	0.991	0.499***	0.793	0.764*	0.721***	0.772	0.771*
	Birthplace(1)	0.955*	0.848*	0.902	0.918	0.791	1.189	1.415***	1.276	0.832
	Sex(1) by age(1)	0.898***	1.049	0.964	1.481	1.691	0.947	0.829	0.998	0.928
	Constant	2.971***	2.681***	1.671***	2.904***	7.34***	1.671***	0.984	1.896**	2.343***
Step 2(a)	Sex(1)	1.039**		0.931		0.263***	0.746***	0.847*	1.017	1.111
	age(1)	1.042**	0.92	1.191**	1.684***	1.419	1.667***	1.397***	1.605***	1.138
	NSSeC(1)	1.131***	1.255*	1.585***	0.678**		1.357*	1.149	1.349	0.901
	NSSeC(2)	0.987	1.055	0.915	0.388***		0.743**	0.822*	0.839	0.747**
	NSSeC(3)	0.955**	0.858	0.99	0.498***		0.765*	0.717***	0.772	0.768*
	Sex(1) by age(1)	0.897***	1.042		1.403*	1.671				
	Constant	2.961***	2.673***	1.684***	2.849***	5.91***	1.684***	1.017	1.897**	2.367***
	Birthplace(1)		0.848*	0.902	0.923	0.854	1.188	1.408***	1.276	0.834
Step 3(a)	age(1)	1.024	0.939	1.185**	1.731***	1.464	1.651***	1.384***	1.607***	1.136
	NSSeC(1)	1.128***	1.254*	1.6***	0.689**		1.332*	1.177	1.346	0.899
	NSSeC(2)	0.989	1.059	0.911	0.396***		0.736**	0.803*	0.839	0.76**
	NSSeC(3)	0.956**	0.861	0.985	0.501***		0.761*	0.702***	0.771	0.779*
	Sex(1) by age(1)	0.932***			1.415*	1.64				
	Constant	3.012***	2.669***	1.625***	2.668***	5.103***	1.786***	0.948	1.914***	2.475***
	Birthplace(1)		0.848*	0.906				1.418***	1.276	0.826*
	Sex(1)					0.274***	0.752***			
Step 4(a)	NSSeC(1)	1.128***	1.265*	1.591***	0.694*		1.289		1.352	0.887
	NSSeC(2)	0.988	1.064	0.924	0.408***		0.689***		0.826	0.752**
	NSSeC(3)	0.955**	0.86	0.989	0.514***		0.719**		0.762	0.771*
	Sex(1) by age(1)	0.948***								
	Constant	3.035***	2.56***	1.506***	2.627***	4.766***	1.644***		2.406***	2.69***
	Birthplace(1)		0.858							0.797*
	age(1)			1.234***	2.022***	1.695*	1.621***		1.451**	
	Sex(1)				-	0.384***	-			
Step 5(a)	NSSeC(1)		1.238	1.601***	-		-		1.419*	
	NSSeC(2)		1.055	0.943	-		-		0.917	
	NSSeC(3)		0.852	0.994	-		-		0.769	
	Constant		2.461***	1.642***]	6.205***	4		2.685***	2.264***
	Sex(1)			-		0.449***	4			
	Birthplace(1)			-			4			0.809*
Step 6(a)	Constant		2.521***			4.798***			2.708***	1.911***

*** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level

Note: Sex(1)=Female; Age(1)=16-29; Birthplace(1)=Born outside UK; NSSeC(1)=Higher managerial and professional; NSSeC(2)=Lower managerial and professional; NSSeC(3)=Intermediate. Reference category= NSSeC Lower, male, 30-74, born in UK.

		Ethnic Groups										
		White		Mixed		Indian		Pakistani		Bangladeshi		
		Non-London sett	London sett									
Step	Sex(1)	1.1***	1.144***	0.497***	1.038	0.923	0.969	0.879	1.132	1.145	0.503**	
1(a)	age(1)	0.573***	0.509***	0.692*	0.714***	0.599***	0.684***	0.963	0.872	1.825*	1.036	
	NSSeC(1)	0.603***	0.487***	0.858	1.075	1.55***	1.541***	1.071	1.311*	1.596	1.085	
	NSSeC(2)	0.664***	0.54***	0.729*	0.832**	1.017	1.118	0.66***	0.784*	0.95	0.803	
	NSSeC(3)	0.775***	0.771***	0.774	0.994	1.219*	1.122	0.829	0.92	1.004	1.261	
	Birthplace(1)	0.688***	0.361***	0.808	0.647***	1.129*	0.925	0.941	0.669***	0.99	1.061	
	Sex(1) by											
	age(1)	0.916***	0.899***	1.344	0.88	0.743**	1.045	0.799	0.731	0.471	0.803	
01	Constant	5.915***	1.941***	4.24***	0.663***	1.262**	0.398***	1.167	0.477***	1.034	0.411***	
Step	Sex(1)	1.039**		0.61***		r	0.988	0.897		1.148	0.495**	
2(a)	age(1)	0.55***		0.805*	0.701***	0.622***	0.699***		0.836	1.829*		
	NSSeC(1)	0.603***		0.862	1.076	1.559***	1.539***	1.077	1.306*	1.598	1.083	
	NSSeC(2)	0.664***		0.725**	0.834**	1.017	1.117	0.661***	0.789*	0.951	0.802	
	NSSeC(3)	0.774***		0.762*	0.996	1.22*	1.122	0.831	0.918	1.005	1.255	
	Birthplace(1)	0.688***		0.812	0.646***	1.133*	0.925	0.95	0.661***		1.055	
	Constant	6.063***		3.845***	0.674***	1.213**	0.395***	1.136	0.5***	1.025	0.421***	
	Sex(1) by				0.014	0 000***		0 774	0.000	0.47	0.00	
Stop	age(1)	0 554***	1	0.040*	0.914	0.080	0 000***	0.771	0.820	0.47	0.83	
3(a)		0.001***		0.816	0.007	0.591	0.098	1 002	0.77**	1.785	1.074	
0(u)	NSSeC(1)	0.601***		0.834	1.077	1.572****	1.542	1.083	1.321"	1.614	1.074	
	NSSeC(2)	0.666***		0.71**	0.83**	0.998	1.117	0.667***	0.784^	0.956	0.794	
	NSSeC(3)	0.778***		0.754*	0.992	1.208*	1.121	0.834	0.903	1.021	1.249	
	Birthplace(1)	0.688***			0.646***		0.926		0.672***			
	Constant	6.157***		3.696***	0.675***	1.326***	0.392***	1.1	0.495***	1.044	0.442***	
	Sex(1)	4		0.617***		l	1	0.898		l	0.494**	
	Sex(1) by age(1)					0.683***		0.784		0.54**	0.821	

Appendix C: Exp(B) and significance for Model 3 non-London and London districts separate

		Ethnic Groups									
		White		Mixed	Mixed			Pakistani		Bangladeshi	
		Non-London	London	Non-London	London	Non-London	London	Non-London	London	Non-London	London
		sett	sett	sett	sett	sett	sett	sett	sett	sett	sett
Step	Sex(1)			0.608***						_	0.423***
4(a)	NSSeC(1)			0.859			1.549***	1.087	1.365**		1.079
	NSSeC(2)			0.721**			1.13	0.664***	0.812		0.798
	NSSeC(3)			0.756*		_	1.128	0.832	0.931		1.253
	Constant			3.209***	0.639***		0.367***	1.083	0.403***	1.148	0.441***
	age(1)				0.667***		0.717***		_	1.742*	
	Birthplace(1)				0.655***				0.744***		_
	Sex(1) by										
	age(1)			1	7			0.715***	J	0.52**	
Step	Sex(1)			0.587***						-	0.419***
5(a)	Constant			2.711***				0.98	0.328***	1.6***	0.45***
	Sex(1) by										
	age(1)							0.696***		0.65*	
	NSSeC(1)								1.44***		
	NSSeC(2)								0.866		
	NSSeC(3)								0.954		
	age(1)										_
Step]									
6(a)	Constant]								1.377***	J

		Ethnic Groups							
		Caribbean		African		Chinese		Other	
		Non-London sett	London sett	Non-London sett	London sett	Non-London sett	London sett	Non-London sett	London sett
Step	Sex(1)	0.64***	0.773***	0.557***	0.976	0.606*	0.851	0.884	1.089
1(a)	age(1)	1.257	1.228*	0.524***	0.862*	0.391***	0.639***	0.577***	0.918
	NSSeC(1)	0.742*	1.237*	1.198	1.378***	0.508**	0.842	1.445**	1.651***
	NSSeC(2)	0.715**	1.01	0.916	1.057	0.366***	0.68**	1.256	1.186**
	NSSeC(3)	0.854	1.133	0.908	1.06	0.839	0.998	1.511**	1.266***
	Birthplace(1)	0.894	0.912	1.53**	0.789***	1.038	1.072	1.174	1.159*
	Sex(1) by age(1)	0.843	0.787*	1.388	0.814*	1.265	1.135	1.286	0.64***
	Constant	1.607***	0.311***	1.039	0.441***	7.129***	0.59***	1.126	0.264***
Step	Sex(1)	0.601***	0.773***	0.514***		0.607*	0.852		1.124*
2(a)	age(1)	1.16	1.245**	0.514***	0.871*	0.385***	0.625***	0.601***	
	NSSeC(1)	0.743*	1.261**		1.381***	0.51**	0.84	1.455**	1.656***
	NSSeC(2)	0.717**	1.024		1.055	0.366***	0.674***	1.244	1.192**
	NSSeC(3)	0.855	1.146		1.059	0.838	0.996	1.509**	1.276***
	Birthplace(1)	0.886		1.501**	0.79***			1.178	1.173*
	Constant	1.656***	0.298***	1.107	0.436***	7.356***	0.63***	1.079	0.252***
	Sex(1) by age(1)		0.785*	1.429	0.795**	1.267	1.138	1.141	0.588***
Step	age(1)	1.176	1.1	0.606***		0.435***	0.671***	0.635***	
3(a)	NSSeC(1)	0.746	1.266**		1.392***	0.52**	0.84	1.443**	1.652***
	NSSeC(2)	0.727*	1.035		1.066	0.374***	0.674***	1.262	1.2**
	NSSeC(3)	0.866	1.15		1.069	0.86	1	1.53**	1.287***
	Birthplace(1)			1.513**	0.801***			1.168	1.173*
	Constant	1.586***	0.308***	1.021	0.418***	6.706***	0.613***	1.082	0.261***
	Sex(1)	0.597***	0.708***	0.608***		0.704*	0.897]	
	Sex(1) by age(1)				0.712***				0.636***

		Ethnic Groups								
		Caribbean		African		Chinese		Other		
		Non-London	London	Non-London	London	Non-London	London	Non-London	London	
		sett	sett	sett	sett	sett	sett	sett	sett	
Step	Sex(1)	0.598***	0.715***	0.629***						
4(a)	NSSeC(1)	0.746	1.253**			0.556**	0.849	1.455**	1.636***	
	NSSeC(2)	0.717**	1.022			0.372***	0.671***	1.279	1.191**	
	NSSeC(3)	0.876	1.143		_	0.867	0.991	1.528**	1.28***	
	Constant	1.683***	0.319***	1.403***		5.497***	0.579***	1.214	0.3***	
	age(1)			0.569***		0.427***	0.668***	0.613***		
	Birthplace(1)				-					
	Sex(1) by									
	age(1)			-					0.621***	
Step	Sex(1)	0.577***	0.716***							
5(a)	Constant	1.433***	0.342***	1.147			0.505***	1.593***		
	Sex(1) by									
	age(1)									
	NSSeC(1)									
	NSSeC(2)									
	NSSeC(3)									
	age(1)]		0.557***]		0.649***	0.592***		
Step					-				-	
O(-)	O a matanat									

6(a) Constant *** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level Note: Sex(1)=Female; Age(1)=16-29; Birthplace(1)=Born outside UK; NSSeC(1)=Higher managerial and professional; NSSeC(2)=Lower managerial and professional; NSSeC(3)=Intermediate.

Reference category= NSSeC Lower, male, 30-74, born in UK.