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Ethnicity and Neighborhood Attainment in England and
Wales

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Abstract

Ethnic minorities' spatial concentration and their predominance in deprived areas are two well-known patterns that characterize Britain's social landscape. However, little is known about ethnic minorities' opportunities for spatial integration, especially after individual, social origin and childhood neighborhood characteristics have been taken into consideration. Using a large-scale longitudinal dataset of England and Wales covering a forty-year period (1971-2011), in combination with aggregated Census data, the author examines ethnic inequalities in access to neighborhoods with varying levels of ethnic concentration and deprivation. The article reveals that ethnic minorities are less likely than white British individuals to reside in 'whiter' and less deprived neighborhoods. These effects, however, reduce, for most groups, among those with higher education and a higher social class, in line with one version of the place stratification/ethnic enclave model. Growing up in areas with high ethnic concentration and high deprivation has a particularly strong 'retention effect' among Asians: their probabilities of being found in 'whiter' and less deprived areas in adulthood are the lowest. Among Africans, growing up in a less deprived area brings no benefits for future neighborhood outcomes. Ethnic groups' unequal access to neighborhoods suggests that group-specific preferences and constraints play a role in neighborhood attainment.

Keywords

Ethnicity; England and Wales; Neighbourhood deprivation; Neighbourhood ethnic concentration; Neighbourhood attainment; Spatial assimilation

1. Introduction¹

As in many other destination countries around the world, two well-known patterns characterize the spatial location of migrants and their children in the UK – also called *ethnic minorities* there. First, they tend to concentrate in space (Rees and Butt 2004, Simpson 2012); and, second, they tend to live in areas with high deprivation (Jivraj and Khan 2013). To date, most of the research given over to ethnic minorities' spatial patterns is centered on spatial segregation and residential moves from a macro perspective. Studies have been dedicated, for example, to spatial segregation indices (Catney 2016a, Catney 2017, Simpson 2007, Simpson 2012), and internal migration rates (Simpson and Finney 2009). This macro perspective has also been used to explore the links between neighborhood deprivation and ethnic concentration (Harris, Johnston and Manley 2017, Jivraj and Khan 2013).

While these studies are fundamental for understanding how ethnic segregation evolves over time and how this connects to neighborhood deprivation, they are not sufficient for understanding the relationship between ethnic and spatial inequalities. One of the key interests of researchers dedicated to the study of the (in)equality of outcomes (of any kind, including those related to neighborhoods) across groups, is whether and to what extent these inequalities hold after we consider (in)equality of individual and social origin characteristics, as well as those of the neighborhood of residence during childhood ('origin neighborhood'). While this approach, strongly connected to the social stratification literature (Boudon 1973, Hout and DiPrete 2006), is increasingly being incorporated into the study of educational and labor-market outcomes (Heath and Cheung 2007, Platt 2005, Zuccotti 2015a), it has not yet been applied to the study of neighborhood outcomes. A key issue is whether ethnic minorities reside in or move to less concentrated and less deprived neighborhoods to the same extent as white British individuals, once individual, social origin and origin neighborhood factors –which play a role in neighborhood choice– have been taken into consideration. Furthermore, it is also of interest to understand whether these factors (e.g. education, social class), play out differently on neighborhood outcomes across ethnic groups. These questions are at the core of the well-known models of spatial assimilation, place stratification and ethnic enclave (Bolt and van Kempen 2010, Logan and Alba 1993, Massey and Denton 1985), designed to explain the spatial dimension of ethnic inequalities (or the lack thereof). While these models have been largely tested in the US (Alba and Nee 2003, Crowder, South and Chavez 2006, Logan and Alba 1993, Logan, Zhang and Alba 2002, Massey 1985), their application to Western Europe (Bolt and van Kempen 2010, Schaake, Burgers and Mulder 2013), including the UK (Coulter and Clark 2016), remains limited.

In this study, I use a large-scale longitudinal dataset of England and Wales covering a forty-year period (1971-2011), in combination with aggregated Census data, to empirically test the three models of spatial integration for the most numerous non-white ethnic minority groups in the UK. The longitudinal nature of this dataset allows for a consideration of key factors that influence neighborhood choice, including not only an individual's characteristics (like education or social class), but the characteristics of the neighborhood where he or she grew up, as well as their social origins,

¹ The permission of the Office for National Statistics to use the Longitudinal Study is gratefully acknowledged, as is the help provided by staff of the Centre for Longitudinal Study Information & User Support (CeLSIUS), in particular Wei and Rachel. CeLSIUS is supported by the ESRC Census of Population Programme (Award Ref: ES/K000365/1). The authors alone are responsible for the interpretation of the data. This work contains statistical data from ONS, which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets, which may not exactly reproduce National Statistics aggregates. The permission of Dr Paul Norman, School of Geography, University of Leeds, to use the 2011 Carstairs Index of Deprivation he created is gratefully acknowledged. Please see Norman P. and Boyle P. (2014) Are health inequalities between differently deprived areas evident at different ages? A longitudinal study of census records in England and Wales, 1991–2001, *Health & Place*, 26, 88-93, for use of the Carstairs Index in conjunction with the ONS LS.

such as parental socioeconomic resources. Two outcomes of *neighborhood attainment* are examined, which capture two different dimensions of ethnic minorities' spatial integration: neighborhood ethnic concentration and neighborhood deprivation. The study focuses solely on groups that are born and/or mostly raised in the UK, making, therefore, a stronger case in terms of integration (or the lack thereof): in principle, these ethnic minorities should have the same rights as the majoritarian white British population. The paper focuses on three questions. First, I look at ethnic groups' propensities to reside in neighborhoods with less ethnic concentration and less deprivation, given individual, social origin and origin neighborhood characteristics (Question 1). Next, I explore whether the role of education and that of social class play out differently on neighborhood attainment for different groups (Question 2). Finally, I explore the role of origin neighborhood characteristics on ethnic groups' neighborhood attainment (Question 3).

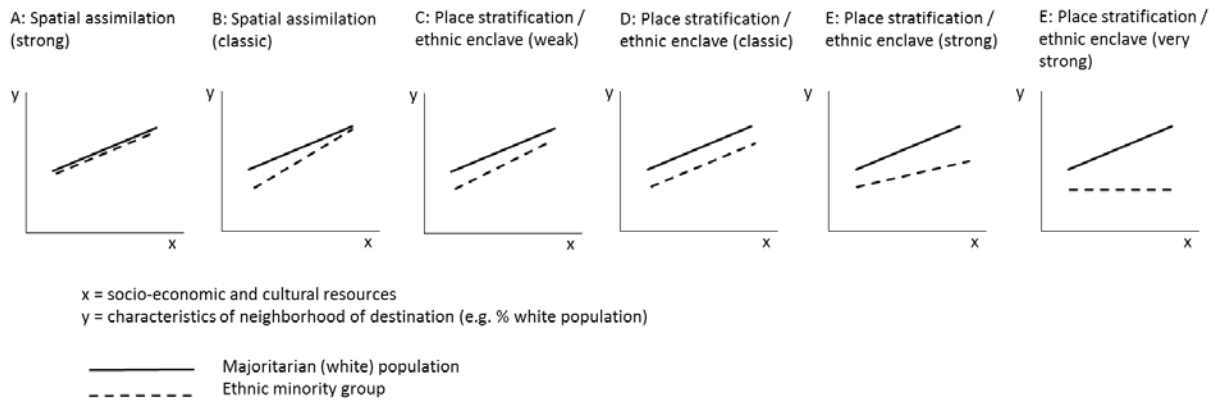
The UK presents a valuable case study for studying ethnic differences in neighborhood attainment, given its established, long-standing migrant-origin population. In 2011, around 12 percent of the population self-identified as belonging to a non-white ethnic minority group; among these, more than 40 percent were born in the UK. I distinguish the most numerous non-white groups: Indian, Pakistani, Bangladeshi, Caribbean, and African. Their contrasting migration histories and settlement patterns (Phillips 1998, Robinson and Valeny 2005), socioeconomic resources (Cheung and Heath 2007, Platt, Simpson and Akinwale 2005), cultural values and religion (Khatab and Modood 2015, Peach 2005), and levels of spatial segregation (Carling 2008, Catney 2016b) allow me to develop divergent expectations in terms of their spatial integration. This paper is, to the best of my knowledge, the first to systematically look at patterns of neighborhood attainment among ethnic minorities raised in the UK in comparison with the majoritarian white British population.

2. Theoretical and empirical background

2.2 *Spatial assimilation and other models of spatial integration*

Currently, three main models dominate our understanding of spatial integration (or its absence) among migrants and their children. The model of *spatial assimilation*, formalized by Massey (1985), states that as migrants acculturate and improve their socioeconomic situation in destination countries, they also transform these 'gains' into residential gains, moving to 'whiter' and less deprived areas. Most importantly, the model predicts that differences in neighborhood attainment between minority and majoritarian groups will disappear among those with more resources. This is illustrated in Figure 1B (Alba and Logan 1993, Logan and Alba 1993), where the characteristics of the neighborhood of destination (Y-axis) are set as a function of various cultural and socioeconomic indicators (X-axis). A very strict definition of spatial assimilation would be that shown in Figure 1A, which denotes how both minority and majority groups have gained the same neighborhood attainment given equal resources (I call this 'strong' spatial assimilation).

Figure 1: Models of neighborhood attainment



(Adapted from Logan and Alba 1993)

Spatial assimilation, however, does not always occur. Migrants have different opportunities and constraints regarding their choice of a neighborhood, as well as different preferences in terms of what constitute a desirable location (Bolt and van Kempen 2010, Crowder, South and Chavez 2006). The acknowledgment of these interconnected factors has led to the development of two other models of spatial integration: *place stratification* and *ethnic enclave*. The place stratification model states that minority groups will not be able to transform their socioeconomic or cultural resources into ‘good neighborhoods’ to the same extent than the majoritarian population does, due to external factors like discrimination and harassment (Alba and Logan 1993). These, note, have been well documented for the US (Riach and Rich 2002, Roscigno, Karafin and Tester 2009) and for Europe (e.g. Allasino et al. 2004, Klink and Wagner 1999). Conversely, the ethnic enclave model² (Bolt and van Kempen 2010, Schaake, Burgers and Mulder 2010) is based on the idea that different groups have divergent ideas of what constitute desirable housing or location (Özüekren and van Kempen 2002, Schaake, Burgers and Mulder 2010). Proponents of this model would state that migrants or ethnic minorities are not necessarily motivated to move to a ‘whiter’ area (Clark 2002, Logan, Zhang and Alba 2002), because they get benefits from living with co-ethnics: e.g. groceries or restaurants with certain types of food, churches, social centers, and also sense of belonging, ethnic identity. In this model, preferences, rather than constraints, explain why, for example, having a good income does not necessarily imply living in areas with a larger white population. These two alternative models can be seen in the remaining graphs in Figure 1. In the ‘weak’ version of place stratification (or ethnic enclave, if preferences rather than constraints are present), we observe that though returns to resources are higher for the ethnic minority group, they still lag behind the white population in terms of neighborhood attainment (Figure 1C). The remaining figures present other possible outcomes: in particular, Figures 1E and 1F might apply to the most stigmatized ethnic minority groups, or those with strong ethnic bonds and preference for co-ethnic areas.³

² Ethnic enclave here might also refer to ‘ethnic communities’, in terms of Logan, Zhang and Alba (2002), although these are hard to identify in our data. Note also that the definition of ‘ethnic enclave’ is more linked to residential location than to work location, though these might be linked in practice (for a discussion on this topic refer to Portes and Jensen 1989, Portes and Jensen 1992, Sanders and Nee 1987, Sanders and Nee 1992).

³ It could also be argued that the ‘weak’ form of spatial assimilation has elements of the place stratification and ethnic enclave models, if spatial assimilation is to be interpreted in terms of ‘equality of outcomes given equality of conditions’, as shown by Figure 1A.

2.2 Evidence of spatial integration

Prior research shows that levels of neighborhood attainment, and the role of variables such as income or education on neighborhood attainment, vary considerably by ethnic group and by neighborhood outcome. Black Africans in the US (e.g. Logan and Alba 1993, Woldoff and Ovadia 2009) and individuals from predominantly Muslim countries in Western Europe (Bolt and van Kempen 2010, Coulter and Clark 2016, Rathelot and Safi 2014, Zorlu and Latten 2009), face in general the greatest disadvantages (or gaps) when considering residing in or moving to neighborhoods with low deprivation or low ethnic concentration. This is also reflected in their levels of spatial segregation: they are generally much higher for Black Africans in the US (Logan and Stults 2011), for Turks and Moroccans in the Netherlands (Bolt, Hooimeijer and Van Kempen 2002) and for Pakistanis and Bangladeshis in the UK (Simpson 2012), than for other ethnic minorities in these countries.

Studies that have looked at the role of education, income or wealth on neighborhood attainment across groups show evidence of different models of spatial integration. Research has pointed, for example, to processes that go from classic to very strong place stratification for black Africans in the US. Resources, it transpires, have a lower impact on the probabilities of this population residing in areas with higher average income (Logan and Alba 1993, Woldoff 2008) or areas with higher property values (Woldoff and Ovadia 2009), as compared to non-Hispanic whites. Other studies, however, have shown evidence that is more in line with the weak place stratification model. This seems to be more the case when the dependent variable is either the percentage of the white population in the neighborhood, as in early work by Alba and Logan (1993) and more recent studies by Crowder, South and Chavez (2006), South, Crowder and Pais (2008) and Woldoff (2008), or the probability of residing in the suburbs (Argeros 2013). However, greater returns to education and income among black groups have also been found in a recent study by Swisher, Kuhl and Chavez (2013) that looks at neighborhood poverty. Conversely, Hispanics and Asians in the US in general follow the classical model of spatial assimilation (or a more 'favorable' version of the weak place stratification/ethnic enclave model) more closely. Here neighborhood attainment becomes almost the same among those with higher socioeconomic resources. Often this is because the 'ethnic gap' that needs to be closed with the help of these resources is smaller. Results like these have been found in studies that look at neighborhood attainment both in terms of their share of white population (Alba and Logan 1993, South, Crowder and Pais 2008, Woldoff 2008) and in terms of their socioeconomic level (Logan and Alba 1993, Swisher, Kuhl and Chavez 2013, Woldoff 2008, Woldoff and Ovadia 2009). Logan, Zhang and Alba (2002) also show evidence of ethnic enclave mechanisms among Filipinos, whose higher socioeconomic resources lead to a movement to the suburbs, but not to whiter areas.

The few studies that have dealt with these issues in the Western European context often found spatial integration models that are in line with classic or weak place stratification. In Germany, for example, income does not seem to affect differently the probability that Turks and native Germans will reside in a better quality neighborhood (Lersch 2013). Similar findings are observed in the Netherlands (Schaake, Burgers and Mulder 2013) for Turks and Moroccans, who do not seem to gain from more education; and for Asians in the UK (Coulter and Clark 2016), who are disadvantaged at all income levels. When looking at neighborhoods in terms of the share of white residents, however, both the Dutch and UK-based studies show that higher education and higher income reduce the gap when compared to the majoritarian white population. Black Caribbean groups in both countries, however, more often experience weak place stratification/ethnic enclave, for both neighborhood outcomes.

It is clear from these studies that although spatial assimilation is only a limited phenomenon, socioeconomic and cultural resources often help to reduce ethnic inequalities in terms of neighborhood attainment.

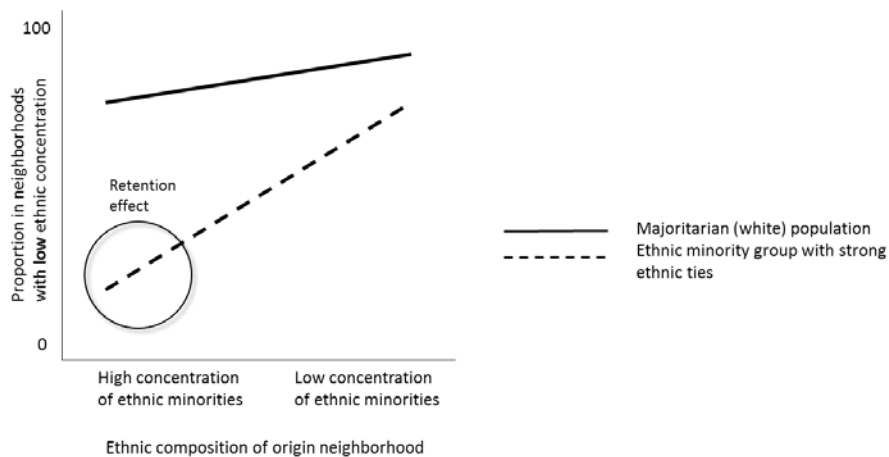
2.3 The role of origin neighborhoods and their potential to help identify ethnic enclave mechanisms

Previously, I argued that in order to identify ethnic inequalities in neighborhood attainment convincingly, factors that predict neighborhood attainment should be taken into consideration. This study includes a series of factors that are known to play a role in neighborhood attainment, and which are included in most of the above-mentioned research: age, education, social class, civil status and presence of children in the household. In addition, the longitudinal nature of the data allows me to include the characteristics of individuals' households during their childhood or early youth (see also: Woldoff 2008, Woldoff and Ovadia 2009). Most importantly, I am also able to control for the single best predictor of current neighborhood characteristics, that is, the characteristics of the neighborhood where the subjects grew up or 'origin neighborhoods' (also recently incorporated in many studies based in the US: e.g. Britton and Goldsmith 2013, Sharkey 2012, South et al. 2016, Swisher, Kuhl and Chavez 2013). Knowing the characteristics of origin neighborhoods in terms of ethnic composition and deprivation is central to neighborhood attainment studies because there is a strong relationship in the types of neighborhoods individuals live in at different points in their lives (see South et al. 2016 who summarize key mechanisms).⁴ Most importantly, research also shows how this relationship is very much dependent on race or ethnicity (Sharkey 2008). For example, Swisher, Kuhl and Chavez (2013), who followed individuals between 1995 and 2001-2002, find that though those who lived in poorer areas in 1995 are also more likely to reside in poorer areas later on, this connection is stronger for Blacks and Hispanics. The authors suggest that neighborhood poverty is, therefore, more of a 'poverty trap' for these two groups than for non-Hispanic whites. Similarly, South et al. (2016), who follow individuals up until their fifties, show that while, over time, both Non-Hispanic whites and black groups improve their neighborhood in terms of average family income over time, this improvement is higher for the former. Britton and Goldsmith (2013), with a different type of study, find evidence in the same direction. In the spirit of these studies, in addition to exploring the role of education and social class on neighborhood attainment, the present study will also address the role of origin neighborhoods on later neighborhood attainments across groups.

Studying the role of ethnic composition of origin neighborhoods, however, can also help us identify ethnic enclave mechanisms. We know that distinguishing between place stratification and ethnic enclave models is a difficult task, unless we have specific information on preferences and constraints. However, one could argue that an 'origin neighborhood effect' connected to ethnic composition is unlikely to be related to place stratification mechanisms. If discrimination, harassment, or any other forms of intolerance of ethnic minorities were present, the place where members of ethnic minorities lived at a young age should probably matter less than ethnicity itself. In other words, the level of discrimination experienced in, for example, the housing market, should mostly vary by ethnicity, and be (more) constant for individuals with the same ethnicity but different neighborhoods of origin. Conversely, if ethnic composition of origin neighborhoods plays a more important role on ethnic minorities' probabilities of moving to 'whiter' or less concentrated areas, as shown in Figure 2, one could presume that mechanisms of ethnic enclave are present. Origin neighborhoods are spaces of early socialization (Urban 2009) where preferences derived from sharing the space with members of the same ethnic group may develop; in particular, this could be expected from groups known for their strong ethnic ties and cultural bonds. I would expect the desire for an 'ethnic enclave' to be stronger among those raised in areas with a higher share of members of the same ethnic minority group, given that they have been socialized in that environment. These developed preferences may, in turn, play a role in decisions about where to live in adult life (South et al. 2016), and hence create a 'retention effect' for those raised in areas with high (co-)ethnic concentration, as observed in Figure 2.

⁴ And one could also argue that this is how models of spatial integration should be tested, since spatial assimilation presupposes a move.

Figure 2: Mechanisms of ethnic enclave; proportion of individuals in neighborhoods with low ethnic concentration, by ethnic composition of origin neighborhood



Of course, one might also argue that being socialized in a ‘whiter’ or less concentrated area provides extra skills to avoid discrimination; however, I will assume that these are less relevant and should be captured, to a great extent, by education and social class. Finally, it is important to recall that not observing an ‘origin neighborhood effect’ does not necessarily imply that mechanisms of ethnic enclave are not taking place. Similarly, we cannot disregard both the fact that choices might reflect the perceived risk of racial harassment outside the ethnic territory and the cultural forces associated with the maintenance of distinctive ethnic identities and lifestyles (Peach 1998, Phillips 1998). These problems do not have a clear solution. Nor can we really know whether a constraint (be it external or from their own group) has been internalized as a preference. However, I expect this analysis to shed light on whether or not mechanisms of ethnic enclave are taking place.

2.4 UK context and expectations

Historically speaking, ethnic minorities in the UK have tended to concentrate in the main metropolitan areas – London in particular – following the jobs created there after the Second World War. The initial settlement of most non-white migrants was marked by poverty and hostility (Phillips 1998, Rattansi 2011). Immigrants were located either in poor private accommodation or in the worst of owner-occupied houses, and spatial segregation started, therefore, to emerge as a problem. Moreover, the link between ethnicity and deprivation became gradually evident: many minorities were found to be trapped in marginal areas in regions suffering from industrial decline, which would later on affect their housing and employment opportunities (Phillips 1998). Over time, segregation measured with one of the most popular indicators – the dissimilarity index (D) – has tended to decrease for all groups (Catney 2016a); the same was observed to the relationship between ethnic concentration and deprivation (Jivraj and Khan 2013). This is likely to be partly connected to improvements in terms of discrimination in the housing market, especially after the Race Relations Act was introduced in 1967 and when local authority housing was opened to ethnic minorities in the late 1960s. However, ethnic segregation and the concentration of minorities in deprived areas both still very much characterize the UK’s social landscape. Pakistanis and Bangladeshis are the most segregated groups in the UK (Catney 2017), with D values that reach almost 80 percent in some metropolitan areas in 2011 (Zuccotti 2015a). They are also the most likely to be found in deprived areas (Jivraj and Khan 2013). Recent research also suggests that Pakistanis are intensifying their spatial clustering and interaction (Zuccotti 2015a).

Aligning in part with the place stratification model, the persistence of these spatial patterns is likely to be related to discrimination by estate agents and housing corporations. There is also the problem of harassment that is known to occur in some areas, and that makes these areas, therefore, undesirable to

ethnic minorities (Bowes, Dar and Sim 2002, Phillips 1998, Phillips 2006). For example, a study among Caribbeans living in council housing showed that their relocation decision-making was strongly motivated by fear of harassment (Phillips 1998). Similarly, a study in the city of Bradford (Phillips 2006) showed that agents shared stereotyped views and mistrust of Pakistanis and Bangladeshis. Fear of rejection and victimisation was also a recurrent theme among these groups, who have also become particularly vulnerable since the 2001 riots in northern England and the London terrorist attacks (Alexander 2002, Bolt, Şule Özüekren and Phillips 2010, Heath and Li 2010, Phillips 2006). However, in line with the ethnic enclave model, preferences are also likely to play a role in maintaining ethnic segregation. For example, Phillips (1998) showed that living close to family and community was an important consideration for Caribbean persons applying for council housing. This preference for living close to co-ethnics was also found among Pakistani and Bangladeshi populations (Bowes, Dar and Sim 1997, Bowes, Dar and Sim 2002, Phillips 2006), especially among older people and married women, who are also likely to move to their husband's house after marriage (Finney 2011). For them, living outside the community might mean more dependence on men and fewer possibilities for developing a network of acquaintances and friends. More generally, Asian populations in the UK – and Pakistanis and Bangladeshis in particular – have a strong sense of community, and concepts of control, family honor and status dominate (Peach 2005). It is, therefore, likely that the role of co-ethnics in the neighborhood is stronger for these two groups, compared to other ethnic minorities.

This evidence leads me to the following general expectations. I expect first that, given similar individual, social origin and origin neighborhood characteristics, ethnic minorities are less likely to be found in less concentrated and less deprived areas, compared to white British individuals. Second, given mechanisms of place stratification, I expect Pakistanis and Bangladeshis to get the lowest returns to education and social class, compared to other groups. Finally, in line with ethnic enclave mechanisms, I also expect individuals from these two groups to be the least likely to move to less concentrated areas when raised in areas with a high ethnic concentration.

3. Data and methods

3.1 Data structure and unit of analysis

The analysis is based on the ONS Longitudinal Study (ONS-LS), a unique dataset that links census information and life events for a 1% sample of the population of England and Wales. More specifically, the ONS-LS consists of a set of census records for individuals linked between successive censuses (1971, 1981, 1991, 2001 and 2011). Slightly more than 500,000 individuals can be found in each census point; people who have information in all census points are around 200,000. In total, around 1,000,000 records cover the full 40 years and five data points of the study. In addition to its large sample, this data is unique in as much as that both household and aggregated census data are attached to each individual and for each census point. This offers a long-term perspective on the socioeconomic, family and neighborhood contexts of individuals.

Following a similar design to that used by Platt (2005, 2005b, 2007), the cases examined here are of individuals who were between 0 and 15 years old in 1971 and 1981 and between 10 and 15 years old in 1991 and who lived with at least one parent (mother and/or father) at that time-point. These individuals are then followed up in 2001 and 2011, when they are between 20 and 55.⁵ The main

⁵ Attrition in the ONS Longitudinal Study derives from eligible individuals not being enumerated at the relevant census, or errors in date of birth details, or through unregistered emigration. Overall, rates of attrition –around 18% across the whole period (Office for National Statistics 2014) – are nevertheless substantially lower than in conventional longitudinal surveys. While there is the risk that selective attrition may introduce bias and there is some evidence that propensity to

rationale behind this selection is that it allows for the initial socioeconomic and neighborhood conditions in which individuals are raised – *origin* characteristics – to be separated out from their *destination* characteristics, their outcomes in later life; namely, their socioeconomic and neighborhood conditions when they are adults. This type of structure allows me to reduce the effects of the self-selection of individuals into initial neighborhoods, as it was probably their parents (rather than themselves) who chose the *origin* location. At the same time, the design also facilitates the separation in time of the outcome variables (neighborhood characteristics), measured in 2011, and mediating variables (education and social class, but also civil status and presence of children), measured in 2001.

The unit of analysis considered here is the pair of *origin-destination* variables. The maximum number of observations *per* individual is two, since individuals can be between 0 and 15 years of age at a maximum of two census-points between 1971 and 1991 and they need to be present both in 2001 and 2011. Around 70 percent of all cases in the data are single individuals. I use robust standard errors in the multivariate analyses, to adjust for repeat observations of individuals.⁶

3.2 Groups under study and variables

This paper examines neighborhood attainment among white British individuals (with UK-born parents) and individuals who identify themselves as belonging to an ethnic minority group (both of whose parents were born abroad; or one in the case of single-parent households).⁷ Most of those from ethnic minorities, who were between 0 and 15 years old in any of the three origin years (1971, 1981 and 1991), were born in the UK, and are thus second generation; however, some also arrived in Britain aged fifteen years old or younger.⁸ The analysis focuses on five ethnic minority groups: Indian, Pakistani, Bangladeshi, Caribbean and African, who are identified by means of the ethnic self-identification Census question in 2011⁹ (when missing, self-identification in 2001 or 1991 is used).

Two characteristics of neighborhoods are considered in this study: ethnic concentration and deprivation. By ‘neighborhood’ I mean the ward¹⁰, a geographical unit used in local government

(Contd.) _____

attrition differs by ethnicity and ethnic concentration of neighborhood, evidence suggests that effects on estimates are small (Platt, 2005).

⁶ I have also explored the distribution of key variables (education, parental and individual’s social class) for an *ad-hoc* dataset created by randomly selecting one unit of analysis *per* individual: the distribution of these variables is very similar for both datasets. The results of these analyses can be found in (Zuccotti 2015b) or are available upon request.

⁷ I exclude individuals who have “mixed parents” (i.e. one parent born abroad and one born in the UK) as well as those with UK-born parents (or one, for single-parent households).

⁸ As a robustness check, the analysis was replicated for individuals who were between 0 and 5 years old in any of the three origin years. This was to explore whether the findings apply as well among those who have been mostly socialized in the UK (especially as regards socialization in school). The results are very similar to the ones presented in this paper (available upon request).

⁹ In 2011 the question is formulated as follows: “What is your ethnic group?” The options are: White (English/Welsh/Scottish/Northern Irish/British; Irish; Gypsy or Irish traveller; other White); Mixed/multiple ethnic groups (White and Black Caribbean; White and Black African; White and Asian; any other Mixed/multiple ethnic background, open question); Asian/Asian British (Indian, Pakistani, Bangladeshi, Chinese; any other Asian background, open question); Black/African/Caribbean/Black British (African; Caribbean; any other Black/African/Caribbean background, open question); Other ethnic group (Arab; any other ethnic group). Note that the ‘Gypsy or Irish traveller’ and ‘Arab’ categories were not separately specified in the 2001 Census form.

¹⁰ The ward is the key building block of UK administrative geography, being the geographical unit used to elect local government councillors in metropolitan and non-metropolitan districts, unitary authorities and the London boroughs in England and unitary authorities in Wales. Wards are very varied in terms of the population they contain and their size. In general, the smallest and most populous ones are in metropolitan areas, where the majority of ethnic minorities are found; while in the countryside, where people are more dispersed, wards tend to be bigger and less populated. Wards are also subject to change over time. In fact, the fundamental principle of ward/division organization is electoral equality, meaning that within a higher administrative area, each elector’s vote bears a similar weight. As population sizes in wards should be approximately equal within a certain higher administrative area, and because people are constantly moving, so

elections, which contains an average of 4,000 individuals. Data on ethnic concentration and deprivation (for each year) comes from the Census. Both variables are expressed in population-weighted quintiles. In practice, neighborhood ethnic concentration has five categories, where quintile 5 contains the wards with the highest concentration of non-white (i.e. Asian and Black)¹¹ populations, where 20 percent of the non-white population lives. Neighbourhood deprivation is measured with the Carstairs scale, a widely used measure for the UK (Boyle, Norman and Rees 2004, McLoone 2004, Norman, Boyle and Rees 2005, Norman 2010, Norman and Riva 2012, Norman and Boyle 2014). It summarizes four variables: proportion of male unemployment; proportion of overcrowded households; proportion of households with no car/van; and proportion of individuals from a low social class. For this five-category variable, quintile 5 contains the most deprived wards where 20 percent of the population lives. Neighbourhood information was attached to each individual in the ONS Longitudinal Study for each year. Although it was not possible to use more detailed neighborhood information (due to disclosure policies), by being a relative measure, quintiles facilitate comparisons over time.

The first dependent variable is the probability of residing in neighborhoods with low ethnic concentration (quintiles 1 and 2) in 2011. Table 1 shows the number of neighborhoods (Wards) and the average share of groups in neighborhoods for the five neighborhood ethnic concentration quintiles in 2011 (based on aggregated census data). Quintiles 1 and 2 have the highest number of wards with white British individuals. Quintile 1 – which comprises most wards in England and Wales – has on average 93 percent of white British individuals and 2.6 percent of non-whites. Quintile 2 is more mixed, but still has, on average, a majority of white British individuals. It is also important to recall that quintiles 1 and 2 include areas with both high and low deprivation levels (see Table 2).

Table 1: Total number of Wards and average percentage of groups in Wards, by neighborhood ethnic concentration in 2011

	Wards	White British	Non-white	Indian	Pakistani	Bangladeshi	Caribbean	African
Q1	7258	93.1	2.6	0.6	0.2	0.1	0.2	0.3
Q2	700	68.7	18.2	4.2	2.8	0.9	1.4	2.6
Q3	304	48.9	33.0	5.9	5.3	1.8	3.5	5.9
Q4	189	32.6	49.4	8.9	8.4	3.8	5.7	9.2
Q5	119	17.3	71.4	21.9	18.7	7.6	3.9	5.5

Source: Author’s own calculations based on aggregated Census data for England and Wales (from www.neighbourhood.statistics.gov.uk).

In terms of the second dependent variable, one would ideally want to explore the probability of residing in the least deprived neighborhoods. As observed in Table 2, wards that have the lowest deprivation levels are, for the most part, predominantly white, for which this would be an even “stricter test” of spatial integration theories, capturing both dimensions of ethnic concentration and deprivation. However, the sample is too small for this purpose: there are very few ethnic minorities currently residing in the least deprived neighborhoods. I, therefore, look at the probability of living in neighborhoods with middle/low deprivation (quintiles 1 to 4), which allows for a more balanced distribution. A limitation with this outcome variable is that preferences and constraints might be less relevant as explanations for an ‘ethnic gap’, given that some of these neighborhoods might actually be

(Contd.) _____

the boundaries need frequent review and alteration. In some years several hundred electoral wards or divisions are affected, and in the extreme case of 2002 no fewer than 1,549 were changed (Office for National Statistics; from <http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/administrative/our-changing-geography/boundary-changes/index.html>). The ward is the only available geographical measure that could be used for the five censuses; other smaller-scale geographical units exist, but these are available only for the most recent censuses.

¹¹ Includes Indian, Pakistani, Bangladeshi, Chinese, Caribbean, African and other non-white groups; excludes white groups and mixed-white.

ethnically mixed (preferences to be close to co-ethnics might be satisfied in an ethnically mixed neighborhood, and discrimination or harassment might be less present).

Table 2: Neighborhood deprivation by neighborhood ethnic concentration, 2011 (row %)

Neighborhood ethnic concentration	Neighborhood deprivation					Total Wards
	Q1	Q2	Q3	Q4	Q5	
Q1	34.8	23.9	20.0	14.3	7.0	7253
Q2	9.9	21.3	23.1	26.5	19.2	694
Q3	2.3	5.3	11.2	33.6	47.7	304
Q4	2.7	1.1	4.3	12.8	79.3	188
Q5	0.0	0.0	5.0	10.1	84.9	119

Note: Q5 means more ethnic concentration population or more deprivation; differences in the number of Wards between Tables 1 and 2 are because deprivation scores were calculated only for Wards that have a minimum of 100 households.

Source: Author’s own calculations based on aggregated Census data for England and Wales (from www.neighbourhood.statistics.gov.uk and data provided by Prof. Paul Norman).

When looking at the effect of the origin neighborhood on later neighborhood attainment across groups, I use the same neighborhood variables, but measured in 1971, 1981 and 1991.¹² In particular, I focus on the effect of having lived in quintile 5 when young: these are, of course, the areas with the highest ethnic concentration and those with the highest deprivation level. Note that although the argument for the ethnic enclave model is based on the potential contacts in the neighborhood among members of the same ethnic group, the principal reason for choosing a ‘non-white’ origin variable for the main model is that it is equivalent to the dependent variable. It also allows for a general classification of neighborhoods, as well as easier comparisons with white British population.¹³ Finally, an important clarification: I am not able to identify whether individuals have actually made a residential move between two precise locations, due to statistical disclosure restrictions. The attainment of a certain type of neighborhood might then be a new neighborhood or the neighborhood in which the individual lived when young.¹⁴

The two main mediating variables (measured in 2001) are education and social class; these are considered indicators of, respectively, cultural and socioeconomic resources, and are the best available variables in the data for this purpose. Although education has previously been linked to socioeconomic assimilation (Alba and Logan 1993; Alba and Nee 2003), in as much as a person with more education can usually obtain more economic resources, this study will treat education more as a cultural asset. This is for two main reasons. First, being more educated also means having spent more time in the

¹² Non-whites are defined differently in each census point, given that the measurement of ethnicity varies across censuses: for 1971 and 1981 neighborhood composition uses the variable “country of birth”, while from 1991 it is based on a “self-identification” measurement. In 1971 and 1981 non-whites are all individuals born in the New Commonwealth, including Pakistan; in 1991, 2001 and 2011, non-whites are self-identified Indian, Pakistani, Bangladeshi, Caribbean, African, Chinese, Asian other, Black other, other ethnic group and Arab (only for 2011).

¹³ As a robustness check, and only for the ethnic minorities, I have replaced ethnic concentration areas with ‘co-ethnic’ concentration areas where quintile 5 refers to areas with the highest number of members of a certain group (Table A1 in the Annex shows, for 1981 and 2011, the relationship between these ethnic quintiles and non-white quintiles). The results (available upon request) are in line with the findings presented here.

¹⁴ This is especially the case when studying neighborhood deprivation, particularly for individuals moving across neighboring quintiles (e.g. from quintile 5 to quintile 4). However, it applies, to a lesser extent, to the neighborhood ethnic concentration variable. It is very unlikely that, for example, a neighborhood with high ethnic concentration in 1981 would become a neighborhood with low ethnic concentration in 2011, given how fast ethnic minority populations grow in the UK. I, therefore, assume that (at least most) neighborhood improvements in terms of ethnic concentration are a consequence of individuals moving.

educational system, which together with the family is one of the most important places for socialization. The level of education would then reflect the degree to which one is socialized in the culture and norms of mainstream society. In this respect, I would expect to see education having a greater effect than social class in attaining areas with lower levels of ethnic concentration. Alongside this, it has also been argued that education can have a separate impact on housing preferences and residential moves by providing, for example, a higher knowledge of how the housing market functions (Özüekren and van Kempen 2002). In the case of ethnic minorities, this might be an extra ‘cultural asset’ in terms of managing the housing market. The second reason is that I will look at the effect of education after controlling for both background socioeconomic factors and social class, which means that the role of education as a socioeconomic asset will be, at least partly, netted out. Education is measured with a 3-category variable: Level 1 or less, Levels 2+3 and Level 4+ (university degree or more). The social class of individuals is measured with the National Statistics Socioeconomic Classification (Office for National Statistics 2010). This classification is based on the Erikson and Goldthorpe class schema (Erikson and Goldthorpe 1992) and was constructed to measure the employment relations and conditions of occupations. This study uses a reduced version of the schema, with four categories: Manual, Petit Bourgeoisie, Intermediate and Service. Key comparisons are made between individuals with Level 1 and university degree; and between individuals with Service (higher and lower managerial, administrative and professional occupations, including large employers) and Manual (lower supervisory and technical occupations, and semi and routine occupations) classes.

Other key controls measured in 2001 are civil status, which, by including partner’s ethnicity, helps to control for selection into neighborhoods and the presence of children in the household. Social background characteristics in origin (measured in 1971-1991) are also considered: EGP parental social class (Erikson and Goldthorpe 1992), tenure, number of cars and number of persons *per* room. The analyses also control for age, gender, number of census points in which the individual participated and the origin year. Statistical models are based on logistic regressions with robust standard errors.¹⁵ The categories of all variables can be seen in Table A2 in the Annex.

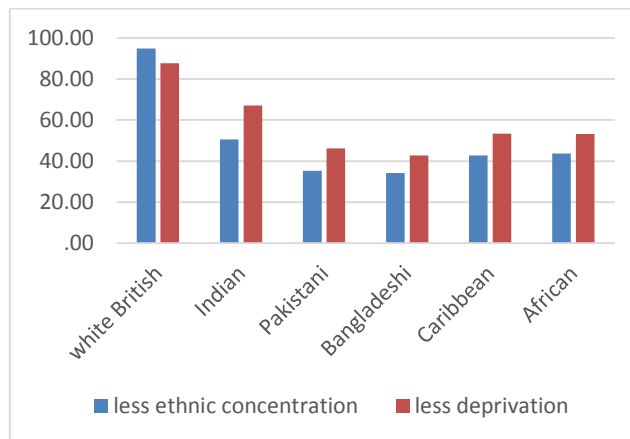
4. Results

4.1 Descriptive statistics

Figure 3 shows the total percentage of each ethnic group residing in neighborhoods with low ethnic concentration and middle/low deprivation; Table 3 shows how this varies by education and social class (measured in 2001) and by origin neighborhood (measured in 1971-1991).

¹⁵ Some cell counts, percentages and totals shown in the tables created with ONS-LS data have been modified in order to comply with publication rules established by the Office for National Statistics. These modifications, however, do not affect the main findings from the regression models.

Figure 3: Individuals in neighborhoods with low ethnic concentration and middle/low deprivation* in 2011, by ethnic group. Percentages.



* Neighborhoods with low ethnic concentration comprise quintiles 1 and 2; neighborhoods with low deprivation comprise quintiles 1 to 4.

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

N=156485 (white British), 2090 (Indian), 982 (Pakistani), 264 (Bangladeshi), 1187 (Caribbean) and 160 (African).

Figure 3 is useful for comparing how groups distribute across both neighborhood classifications. The well-known higher spatial segregation of Pakistanis and Bangladeshis (Simpson 2012) is reflected in the fact that only around 35% of Pakistanis and Bangladeshis in our sample live in neighborhoods with low ethnic concentration; this grows to 50% for Indians and to around 40% for Caribbean and African populations. In terms of deprivation, around 88% of white British individuals live in neighborhoods with middle/low deprivation; this falls to 67% for Indian and to rather less than half for Pakistanis and Bangladeshis.

Table 3: Individuals in neighborhoods with low ethnic concentration and middle/low deprivation* in 2011, by ethnic group, education and social class in 2001, and origin neighborhood in 1971-1991. Percentages.

	White British	Indian	Pakistani	Bangladeshi	Caribbean	African
Percentage in neighborhoods with low ethnic concentration						
Education						
Level 1 or less	94.7	45.1	29.4	36.0	38.2	32.4
Level 4	93.3	55.5	46.3	33.8	47.2	51.2
Social class						
Routine	94.9	43.8	23.7	24.8	40.1	40.6
Prof/Manag	94.5	54.2	44.1	41.1	48.1	41.4
Origin neighborhood**						
High ethnic concentration	76.5	40.6	23.1	20.7	35.8	30.6
Low ethnic concentration	95.8	71.8	61.1	67.2	59.6	60.5
Percentage in neighborhoods with middle/low deprivation						
Education						
Level 1 or less	83.8	54.9	38.0	37.0	46.1	38.2
Level 4	92.6	79.4	60.1	51.5	64.4	54.7
Social class						
Routine	82.5	50.4	33.7	33.1	45.1	40.6
Prof/Manag	92.1	77.7	59.3	56.7	62.8	55.2
Origin neighborhood						
High deprivation	74.0	59.2	37.4	34.3	47.8	50.8
Middle/low deprivation	90.4	80.6	66.3	71.7	59.7	54.7

* Neighborhoods with low ethnic concentration comprise quintiles 1 and 2; neighborhoods with middle/low deprivation comprise quintiles 1 to 4.

** Origin neighborhoods with low and high ethnic concentration comprise quintiles 1 and 2, and quintiles 4 and 5 respectively (in the regression analysis I focus on those who lived in quintile 5; here I have pooled quintiles 4 and 5 due to ONS disclosure policies); origin neighborhoods with middle/low and high deprivation comprise quintiles 1 to 4 and quintile 5, respectively.

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

Table 3 shows that while being in a neighborhood with low ethnic concentration in 2011 does not seem to be strongly connected to the educational level achieved nor to social class among the white British, this, instead, *does* seem to be the case for ethnic minorities. Having a university education in 2001 has a particularly strong impact on Pakistanis' and Africans' neighborhood attainment: their proportions in neighborhoods with low ethnic concentration are around 17-19 points higher, compared to those with low education. For Indians and Caribbeans this effect is around half the size. Similarly, most ethnic minorities with a service class position, in 2001, have a higher proportion in areas with low ethnic concentration, compared to ethnic minorities with a Manual class. The role of social class is strongest for Pakistanis and Bangladeshis. The results in terms of neighborhood deprivation shows that those with a higher education and a higher social class in 2001 have a higher probability of residing in a less deprived neighborhood in 2011. This applies both to white British individuals and to ethnic minorities. However, the effect is stronger among ethnic minorities, leading again to a reduction in the ethnic gap among those with more education and a higher social class. Overall, the greater observed role of the mediating variables for most ethnic minorities means that the gap in neighborhood

attainment between ethnic minorities and white British individuals is reduced for those with more socioeconomic and cultural resources.

As regards variations by origin neighborhood, the results show that those who lived in neighborhoods with more ethnic concentration and more deprivation when young are less likely to end up in neighborhoods with low ethnic concentration and middle/low deprivation in adulthood. This applies, to a greater or lesser extent, to all groups. However, important differences emerge between white British individuals and ethnic minority groups. A clear indication of this is that even white British individuals who lived in areas with high ethnic concentration and high deprivation when young are generally more likely to be found in areas with low ethnic concentration and middle/low deprivation in 2011 than ethnic minorities. Differences between ethnic minority groups are also noticeable. Pakistanis and Bangladeshis are the least likely to have experienced a change from a neighborhood with high ethnic concentration and deprivation to one with low concentration or middle/low deprivation (only a bit more than 20 percent of them have experienced such change). Caribbeans, Africans, and especially Indians, are in a relatively better-off position. Table 3 shows that the effect of having lived in better off neighborhoods is particularly strong for Pakistanis and Bangladeshis in both outcomes; and it is also much weaker for Caribbeans and Africans in terms of neighborhood deprivation. This might indicate the existence of two different mechanisms: on the one hand, strong community effects (and the lack of them among those who live in less concentrated areas) for Asian groups; on the other hand, constraints on black groups, restricting them to more deprived areas.

In the following section, I present multivariate regression models in which I control for key individual, household and social origin variables that may play a role in neighborhood attainment.

4.2 Neighborhood attainment by ethnic group

Table 4 presents Average Marginal Effects derived from logistic regression models for two outcomes: the probability of being in neighborhoods with low ethnic concentration; and the probability of being in neighborhoods with middle/low deprivation. When multiplied by 100, the coefficients refer to the difference in percentage points with respect to the reference category. Model 1 controls only for ethnic group and the characteristics of the origin neighborhood (ethnic concentration for the first outcome; origin deprivation for the second); Model 2 adds origin neighborhood deprivation (for the first outcome) and origin neighborhood ethnic concentration (for the second outcome), the socioeconomic characteristics of the household in which the individual lived at a young age (tenure, number of persons *per* room, number of cars and parental social class) and key individual and household level-variables, measured in 2001 (education, social class, civil status and presence of children in the household). All models control for age, gender, origin year and number of census points in which individuals participated. The full models are available in the Annex (Table A2).

Table 4: Probability of being in a neighborhood with low ethnic concentration and middle/low deprivation* in 2011. Average Marginal Effects.

	Neighborhood with low ethnic concentration		Neighborhood with middle/low deprivation	
	Model 1	Model 2	Model 1	Model 2
Ethnic group (ref. white British)				
Indian	-0.128 (0.009)***	-0.072 (0.007)***	-0.081 (0.009)***	-0.046 (0.009)***
Pakistani	-0.227 (0.016)***	-0.146 (0.014)***	-0.225 (0.017)***	-0.148 (0.016)***
Bangladeshi	-0.226 (0.030)***	-0.137 (0.023)***	-0.225 (0.030)***	-0.109 (0.024)***
Caribbean	-0.198 (0.014)***	-0.125 (0.011)***	-0.218 (0.016)***	-0.125 (0.013)***
African	-0.173 (0.032)***	-0.097 (0.024)***	-0.234 (0.043)***	-0.154 (0.036)***
N	161168	161168	161168	161168
Other controls				
Origin neighborhood ethnic concentration	X	X		X
Origin neighborhood deprivation		X	X	X
Household of origin characteristics ¹		X		X
Individual characteristics ²		X		X

Note: All models control for age, gender, origin year, and number of census points.

¹ Tenure, number of persons per room, number of cars and parental social class.

² Education, social class, civil status and presence of children in the household.

* p-value<.05 ** p-value<.01 *** p-value<.001; robust (clustered) standard errors in parentheses

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

Model 1 shows that – given equality of origin neighborhood characteristics – all ethnic minorities are less likely to be found in areas with a low ethnic concentration and middle/low deprivation as compared to white British individuals. In particular Pakistani and Bangladeshi populations have the highest differences in terms of the probability of accessing neighborhoods with low ethnic concentration, while Indians have the smallest. As regards neighborhood deprivation, Indians are the most similar to the white British, while differences are around three times bigger for the remaining groups. More interesting results are found in Model 2: even after we control for other neighborhood, social origin, household and individual characteristics, differences between ethnic groups remain (though reduced). The least likely to reside in neighborhoods with low ethnic concentration are still Pakistanis and Bangladeshis (around 14% less likely, as compared to white British individuals), while Indians are those with the smallest difference (of around 7% points). In terms of neighborhood deprivation, Pakistanis and Africans are among the most disadvantaged groups: on equality of characteristics they are around 15% points less likely to reside in neighborhoods with middle/low levels of deprivation, as compared to white British individuals. Indians, again, have the lowest difference with respect to the white British: of around 5% points. These results are in line with previous findings that show the generally higher segregation levels of Pakistanis and Bangladeshis (Simpson 2012), as well as the generally lower prevalence of Indians in areas of high deprivation (Jivraj and Khan 2013). They are also in line with research by Coulter and Clark (2016); however, the

present study suggests that pooling groups, as Coulter and Clark do, obscures important differences between groups, especially when looking at Asian minorities.

All in all, the results suggest that white British individuals are more likely to reside in less ethnically concentrated and less deprived areas than ethnic minority groups. These results hold even after we control for factors that are strong predictors of neighborhood attainment: these factors include not only education, social class, civil status and presence of children, but also the socioeconomic characteristics of the households and neighborhoods in which individuals lived when growing up. Pakistanis seem to be the least spatially integrated, with the lowest levels of neighborhood attainment in both outcomes.

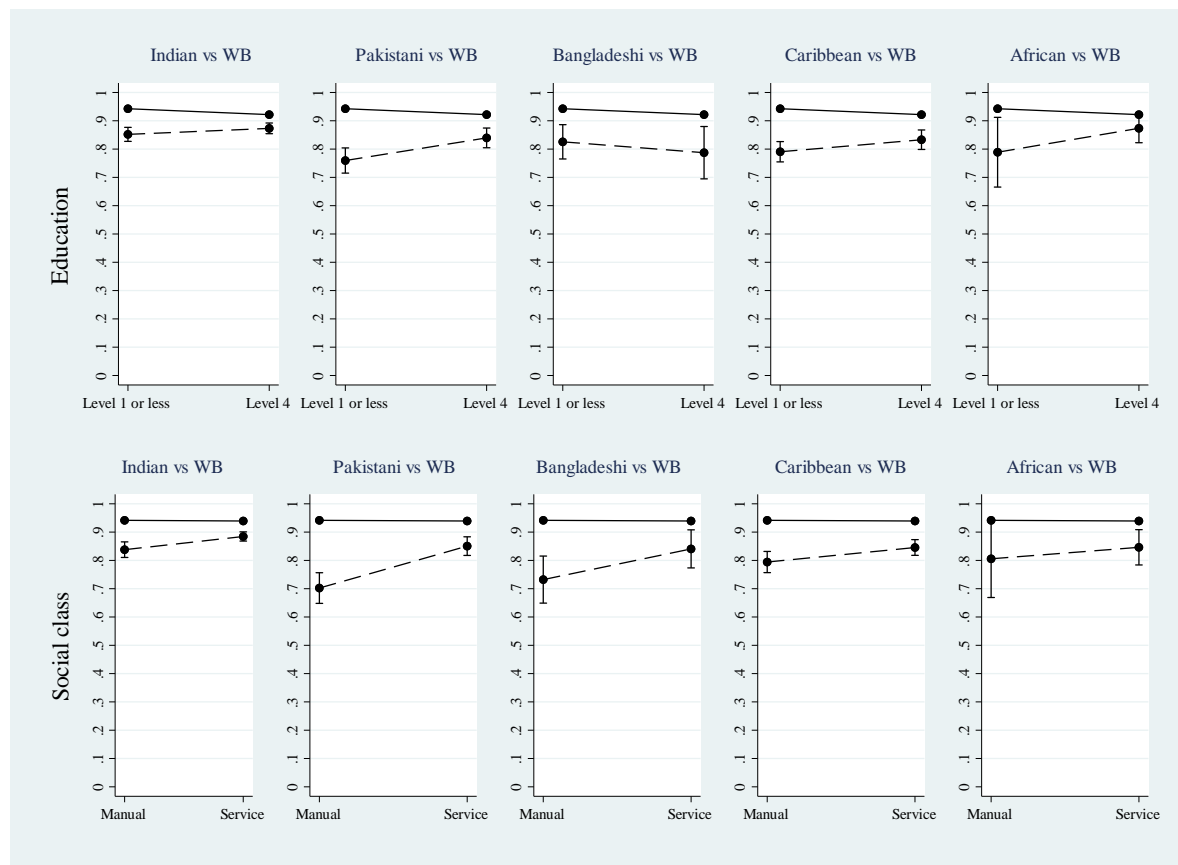
4.3 Neighborhood attainment by ethnic group, education and social class

Next I explore to what extent gaining a higher education and a higher social class in 2001 impacts white British individuals' and ethnic minorities' neighborhood attainment differently in 2011. I look at this question by adding interactions between the variables and ethnic group (one model is done for each interaction: see Table A3 in the Annex). In particular, I focus on the effect of having a university degree (vs. having a level 1 or less) and on the effect of having a service class (vs. a manual class) for different groups.

The interpretation of interactions in logistic regression models is not straightforward as in linear regression models (Norton, Wang and Ai 2004). I have, therefore, computed contrasts from these models (in Stata 14: StataCorp 2015). This command “tests linear hypotheses and forms contrasts involving factor variables and their interactions from the most recently fit model” (StataCorp 2013). Contrasts show the marginal effects of ethnicity in the interaction. That is, it shows, for two groups, the difference in effect of having a university degree or a service class (vs. having a low education or a low social class) on neighborhood attainment in 2011, and shows, too, whether this difference is statistically significant. Contrasts are shown in Figure A1 in the Annex. In these figures, when confidence intervals do not cross the zero line, it means that the effect of education/social class is different between the groups being compared at a $p\text{-value} < 0.05$ (white British individuals are compared to each of the ethnic minority groups). With some exceptions, most interactions are statistically significant.¹⁶

¹⁶ Some p-values fall between 0.07 and 0.15: education*African (outcome=ethnic concentration), education* Pakistani, education* Caribbean and social class*Bangladeshi (outcome=deprivation). I include these results in the discussion.

Figure 4: The role of education and social class on the probability of being in a neighborhood with low ethnic concentration in 2011, for each ethnic minority group (dashed lines) in comparison with the white British (solid lines). Predicted values (95% CI).

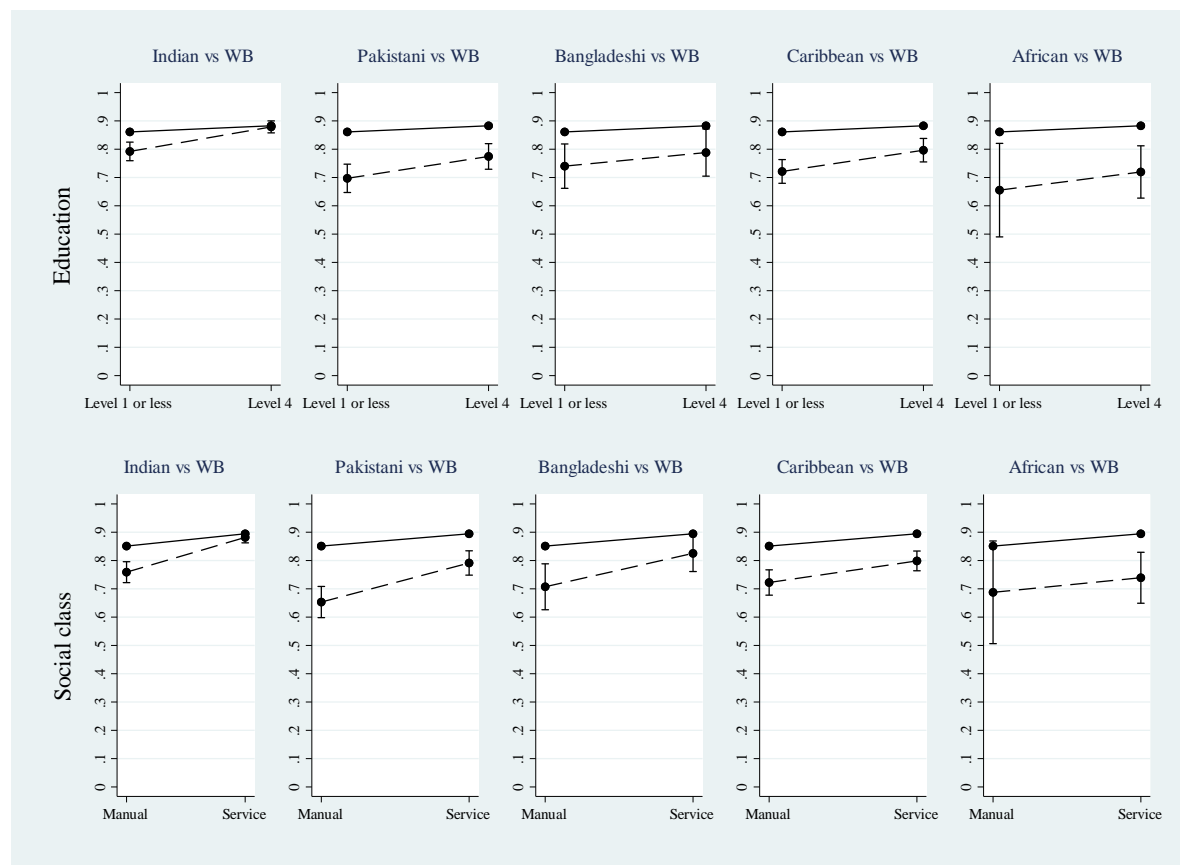


Note: Controls for age, gender, origin year, number of census points, origin neighborhood deprivation, tenure, number of persons per room, number of cars, parental social class, education, social class, civil status, presence of children in the household. Based on models with interactions.

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

Figure 5: The role of education and social class on the probability of being in a neighborhood with middle/low deprivation in 2011, for each ethnic minority group (dashed lines) in comparison with the white British (solid lines). Predicted values (95% CI).



Note: Controls for age, gender, origin year, number of census points, origin neighborhood ethnic concentration, tenure, number of persons per room, number of cars, parental social class, education, social class, civil status, presence of children in the household. Based on models with interactions.

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

Figures 4 and 5 show predicted values of neighborhood attainment for each group and for individuals with low/high education and social class. For both neighborhood outcomes, the effect of education and social class is often stronger for ethnic minorities than for white British individuals. While a higher education and a higher social class have only a relatively small or even no impact on the probability of white British individuals residing in less ethnically concentrated and less deprived neighborhoods (the highest effect is of around 4 percent points, for the role of social class on attaining less deprived neighborhoods), a more mixed picture emerges for ethnic minorities. Results vary depending on the outcome and mediating variable under consideration. The effect of a university degree and of belonging to a service class makes it much more probable that Pakistanis will reside in less ethnically concentrated and less deprived areas. They increase their chances of inhabiting these neighborhoods by 8 to 15 percent points, compared to low educated and low class Pakistanis. Bangladeshis' neighborhood attainment also depends greatly on their social class (but not on their education): belonging to a service class provides around 12 percent points higher chances of living in less deprived and less concentrated neighborhoods. Among Indians, a higher education and higher social class give respectively 9 and 12 percent higher chances of being in a less deprived area; these effects are smaller when looking at ethnic concentration. For Caribbeans we observe an 8 percent effect from education when looking at neighborhood deprivation, and a smaller effect for education and social class when focusing on ethnic concentration. Finally, for Africans we only observe an 8 percent effect from education for ethnic concentration (even with limited statistical significance); however, in all other cases there are no differences with respect to white British individuals.

These findings, which in most cases imply that education and social class is more important for ethnic minorities' (especially Asians) neighborhood attainment than that for the neighborhood attainment of white British individuals, can also be read in terms of the proposed spatial integration models. The fact that many ethnic minority groups gain more from higher education and from higher social class implies that gaps between them and white British individuals fall among those with better educational and social class resources. For example, the gap between white British individuals and Pakistanis in terms of their probabilities of residing in areas with low ethnic concentration falls from 24 percent among those in the manual class to 9 percent among those in the service class. This is one of the strongest effects observed: around 15 percentage points reduction. For other groups reductions vary between 4 and 11 percentage points. Since, in most cases, a gap remains, this suggests a model of weak place stratification/ethnic enclave. There is only one situation where we observe classical spatial assimilation: this is the case of Indians for the attainment of neighborhoods with lower deprivation. This is interesting, as it shows that although educational and socioeconomic resources allow Indians to reside in neighborhoods which are as 'good' as those where equivalent white British individuals live, at the same time these neighborhoods might not necessarily be predominantly white. Finally, the figure also suggests cases of classic place stratification/ethnic enclave: this is, in terms of deprivation, the case with Africans' neighborhood attainment. A similar finding is observed when comparing Bangladeshis and white Britons with different levels of education.

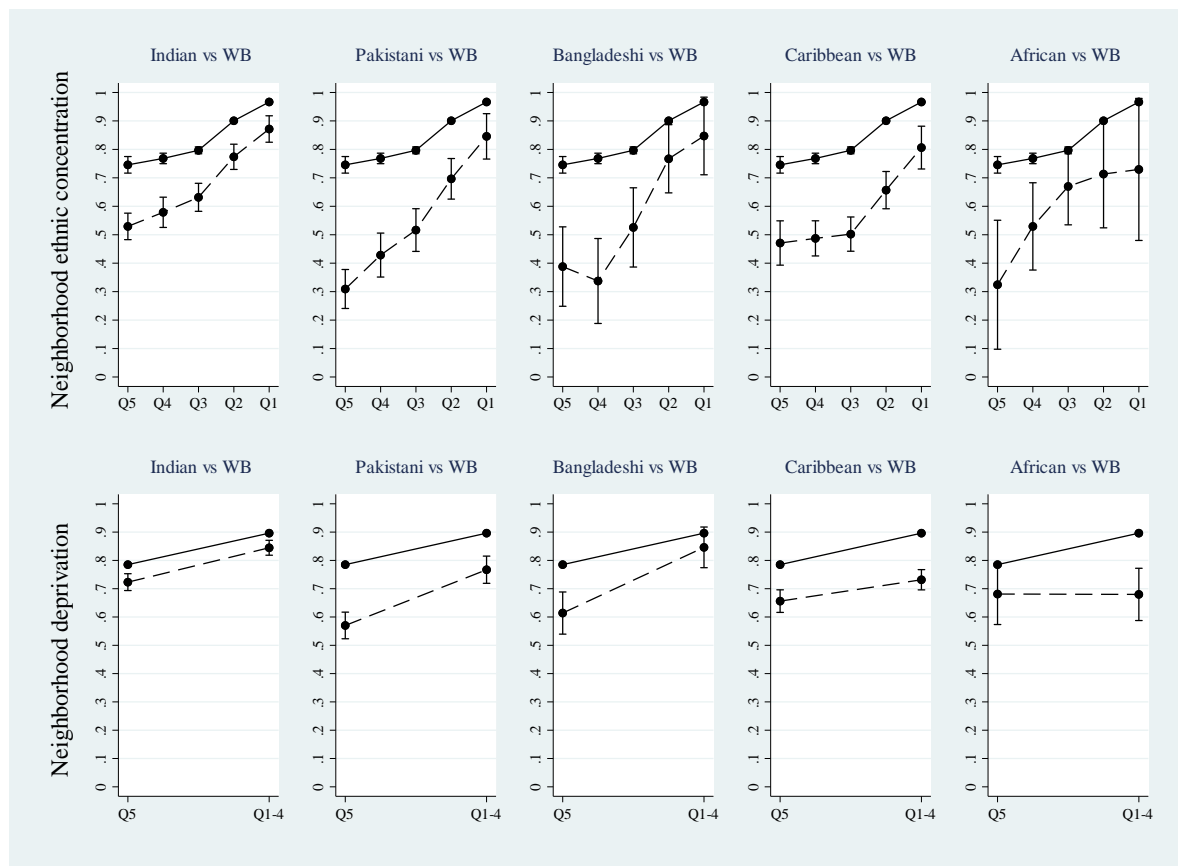
4.4 Neighborhood attainment by ethnic group and origin neighborhood

This section explores the effect of origin neighborhoods on later neighborhood characteristics for different groups. I argued before that looking at the characteristics of neighborhoods where people grew up and how this effects later neighborhood attainment might help to identify ethnic enclave mechanisms. By being places of early socialization, origin neighborhoods might help develop preferences for future residence, especially among ethnic minorities raised in areas of high ethnic concentration. In order to explore this, I have added interaction terms between ethnic group and origin neighborhood's ethnic concentration. I also explore the effect of having lived at a young age in areas with a high level of deprivation across different groups. A greater degree of retention in these areas, however, will not necessarily be the result of ethnic enclave mechanisms. Rather, it will probably speak to the multiple disadvantages experienced by the minorities which I am not able to capture in

the models and which are influencing their neighborhood outcomes in adulthood. As before, I added interactions to the model (see Table A4) and calculated contrasts to identify those that are statistically significant: in particular, I look at the effect of having lived at a young age in quintile 5 (see Figure A2). Statistically significant interactions are observed in most cases.¹⁷ Figure 6 shows predicted values based on the models with interaction effects and all controls.

¹⁷ Some p-values also fall between 0.09 and 0.15: origin deprivation*Caribbean and origin deprivation*African. I include these results in the discussion.

Figure 6: The role of origin neighborhood on the probability of being in being in a neighborhood with low ethnic concentration and middle/low deprivation in 2011, for each ethnic minority group (dashed lines) in comparison with the white British (solid lines). Predicted values (95% CI).



Note: Controls for age, gender, origin year, number of census points, origin neighborhood ethnic concentration/deprivation, tenure, number of persons per room, number of cars, parental social class, education, social class, civil status, presence of children in the household. Based on models with interactions.

Population: Individuals between 30 and 55 years old (2011)

Source: Author's own calculations based on ONS-LS

Having lived at a young age in areas with low ethnic concentration increases the probabilities of residing in a similar area in 2011 for all groups. However, the results reveal that this effect is stronger for Pakistanis and Bangladeshis and, to a lesser extent, for Indians and Caribbeans. In particular, Pakistanis and Bangladeshis who lived in quintile 5 when young have only around 30-40 percent chances of living in areas with low ethnic concentration in 2011; this rises to around 80 percent, for those raised in quintile 1. For white British individuals, although in the same direction, the effect is less strong: from 70 percent to 90 percent. The fact that Pakistanis and Bangladeshis raised in quintile 1 do not reach the same neighborhood attainment as equivalent white British individuals might be evidence of discrimination processes. However, the larger gap among those raised in quintile 5 shows that having lived at a young age in areas with more non-white populations (which, in the case of these two groups is often co-ethnic populations) seems to have a greater “retention effect” for Pakistanis and Bangladeshis. This might point to the role of preferences and, hence, to ethnic enclave mechanisms.

As regards deprivation, we observe a similar pattern when comparing Pakistanis and Bangladeshis with white British individuals: the gap in terms of neighborhood attainment is larger among those raised in areas with more deprivation (while it falls, but does not disappear among those raised in better-off areas). This larger gap might point to additional difficulties that Pakistanis and Bangladeshis face when growing up in highly deprived areas. Among black groups we observe a quite different outcome: having lived in areas with lower deprivation gives these groups a lower relative advantage when compared to white British individuals. Contrary to Pakistanis and Bangladeshis, the deprivation level of their origin neighborhood has a smaller effect on the probabilities of those from black ethnic minorities attaining middle/low deprived areas in 2011, compared to white British individuals. In particular, for Africans this effect is close to zero. This means that the ethnic gap in terms of neighborhood attainment is larger among those raised in better-off areas (around 20 percent points). Although Africans raised in areas with high deprivation have better chances of improving their neighborhood compared to Pakistanis or Bangladeshis from similar areas, they still lag behind the white British. Moreover, the observed flat line (which could be considered per se a ‘good outcome’ since destination depends less on origins) in this context might speak of the particular difficulties Africans face in remaining in relatively better off neighborhoods.

5. Discussion and Conclusion

Understanding the relationship between ethnic and spatial inequalities is of great relevance, not only to researchers but also to society as a whole. One could argue that an increase of ethnic segregation, or a strong connection between ethnicity and neighborhood deprivation, is less problematic if linked to demographic factors: for example, to new births or new arrivals (Finney and Simpson 2009). However, this becomes a matter of concern if associated with discrimination in the housing market or with strong preferences for co-ethnics. Studies dedicated to the analysis of these issues have often relied on macro-perspectives, concentrating, for example, on the evolution of spatial segregation over time, or changes in patterns of migration or neighborhood deprivation across groups. These studies have also often relied on aggregated Census data (e.g. Catney 2017, Harris, Johnston and Manley 2017, Simpson and Finney 2009) or on cross-sectional datasets (Finney and Simpson 2008). However, in order to better understand whether ethnic inequalities have a spatial dimension, the **key question** that needs to be answered is whether groups from different ethnic backgrounds have the same opportunities to reside in or move into areas with specific characteristics, given equality of individual, social origin and origin neighborhood characteristics. To the best of my knowledge – and thanks to the availability of longitudinal data – this is the first study in the UK to present large-scale evidence of this. In so doing, it provides strong empirical grounds for arguing that the above-mentioned mechanisms of preferences and constraints are likely to be part of the explanation why ethnic segregation and the link between segregation and deprivation, continue to be key features of the British social landscape. Specifically, this paper tests classical models of spatial integration – spatial assimilation, place stratification and ethnic enclave. It considers individuals’ characteristics from their youth to their adulthood, and explores the role that socioeconomic and cultural assets, as well as the

characteristics of their neighborhoods when they were growing up, have on adult neighborhood attainment. This study has three main conclusions.

First, there is evidence of ethnic inequalities in neighborhood attainment. Ethnic minorities are, on average, between 7 and 15 percent points less likely to reside in areas with low ethnic concentration, compared to the white British. The greatest differences are found among Pakistanis and Bangladeshis. Similarly, ethnic minorities are between 5 and 15 percent points less likely to reside in areas with middle/low deprivation, as compared to white British individuals. In this case, Pakistanis and Africans present the greatest disadvantages. For both outcomes, Indians are in the opposite situation, having the lowest gaps with respect to white British individuals. These differences are considerable, given that the analysis controls not only for individual and household characteristics, but also for individuals' social origins and the characteristics of the neighborhood in which they lived at a young age.

Second, the study also finds that, in most cases, ethnic inequalities in neighborhood attainment fall among those with more education and from a higher social class (in line with weak place stratification). In practice, this means that ethnic minorities' probabilities of residing in less concentrated and less deprived neighborhoods become more similar to those of white British individuals if they have higher cultural and socioeconomic resources. Quite unexpectedly, Pakistanis – the ethnic minority with the greatest spatial disadvantages – are also the ones who mostly gain from this. An important exception are Africans, who are not only among the most disadvantaged in terms of neighborhood deprivation, but who also experience this disadvantage at high and low levels of education and social class.

Finally, the study shows evidence that preferences for co-ethnics – connected to upbringing in neighborhoods with high ethnic concentrations – probably play a role in spatial integration. The effect of origin neighborhood is particularly strong for Pakistani and Bangladeshi populations, denoting a 'retention' effect among those who lived in more ethnically concentrated areas when young. When applied to the study of deprivation, the results show a similar result; here the results suggest that some neighborhoods might be "poverty traps" for these minorities (Swisher, Kuhl and Chavez 2013). A different picture emerges for the black populations: having lived in a better off neighborhood when young brings less or even no benefit, compared to white British individuals. This is also problematic in terms of spatial integration, since it suggests that these groups are more often reduced to living in poorer areas, even if they were raised in better ones.

Taking all these results together, the fact that ethnic inequalities tend to fall among those with more educational and socioeconomic resources is a positive outcome in a context where ethnic minorities are increasingly obtaining university degrees – even more than white British individuals (Crawford and Greaves 2015) – and improving their occupational opportunities – especially when compared to the previous generation (Cheung and Heath 2007, Zuccotti 2015a). It means that they are able to use these resources to better position themselves in their choice of a neighborhood. Furthermore, ethnic gaps in neighborhood attainment also tend to be smaller among those who lived at a young age in areas with lower ethnic concentration and lower deprivation (the latter for Asians only). This suggests that parental choices/possibilities for a minority family to reside in more spatially integrated neighborhoods can be to the advantage of their children.

However, important ethnic gaps remain. This suggests that ethnic discrimination and harassment, but also ethnic-specific preferences developed in highly concentrated neighborhoods – especially among Pakistanis and Bangladeshis (Peach 2005, Simpson 2012) – are likely to play a role in the process of neighborhood allocation in the UK. Of particular concern are those: with less education; from lower social classes; or those who lived when young in areas that were deprived or with higher ethnic concentration. They are in general substantively less likely to achieve relative spatial integration compared to their white British counterparts. Most importantly, these are not recent migrants, for whom such a pattern would be perhaps expected (Massey 1985), but individuals who are born and/or mostly raised in the UK. This means that an overlap between poor individual characteristics, ethnic concentration and deprivation might grow over time. The negative effects of neighborhood deprivation on a series of outcomes, such as employment (Feng, Flowerdew and Feng

2013) or mortality and health (Boyle, Norman and Rees 2004) are already well documented. In addition, previous findings show that ethnic concentration can have negative effects for some groups' labor-market outcomes (Clark and Drinkwater 2002), in particular those of Pakistanis and Bangladeshis (Clark and Drinkwater 2002, Khattab et al. 2010, Zuccotti and Platt 2016). This might lead to a vicious circle that prevents ethnic minorities from improving their opportunities in the labor market and also, as the present study suggests, from moving to better off areas, with less deprivation and lower ethnic concentrations. These findings might, thinking of the UK policy debate, also have a negative impact in social cohesion as a whole (Cantle 2012, Modood and Meer 2012, Rattansi 2011), by preventing individuals from different ethnic and socioeconomic backgrounds from interacting on a daily basis.

This study has its limitations, of course. Although the possibility of measuring variables at different time points in time is one of its strongest assets, the number of variables that can be included in the models is limited, due to the nature of the data (coming from the Census). For example, we are not able to include income or wealth (Coulter and Clark 2016, Crowder, South and Chavez 2006), something which is known to have an effect on neighborhood attainment. Furthermore, the ten-year interval between censuses means that we might potentially miss relevant information connected to individual socioeconomic and neighborhood changes. This implies that the ethnic gap found – and the explanations connected to it, like ethnic discrimination or preferences for co-ethnics – might, therefore, be overestimated. Another limitation regards the quality of neighborhood measures. As argued before, quintiles are good for comparisons over time and across groups that have different levels of segregation; however, this also means that we cannot easily establish whether these patterns hold for certain levels of ethnic minority concentration and deprivation, nor whether there is a tipping point at which these effects 'kick in'.

This study is the first to show that ethnicity is a fundamental factor that influences neighborhood attainment in the UK. Its effect prevails even after individuals' socioeconomic and cultural resources, and most importantly, their social origins and origin neighborhood characteristics, have been taken into consideration. This suggests that the spatial location of ethnic groups is likely to be the result of ethnic-specific preferences and constraints. More research is needed to disentangle the strength of each of these mechanisms.

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Annex

Table A1: Neighborhood ethnic concentration by neighborhood ethnic-specific concentration (column %)

	Indian concentration					Pakistani concentration					Bangladeshi concentration					Caribbean concentration					African concentration				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Neighbourhood ethnic concentration (1981)																									
Q1	94.1	25.3	0.0	0.0	0.0	85.0	7.0	0.0	0.0	0.0	84.9	19.8	6.5	0.0	0.0	87.5	4.0	0.0	0.0	0.0	94.3	34.6	0.0	0.0	0.0
Q2	5.3	55.7	30.8	1.6	0.0	11.5	33.2	27.0	0.0	0.0	11.2	33.7	29.6	18.2	0.0	11.0	49.5	3.7	0.0	0.0	5.1	55.0	24.8	0.0	0.0
Q3	0.5	13.5	41.4	34.1	0.0	2.3	29.4	37.0	45.7	9.1	2.5	24.1	26.9	50.0	11.1	1.2	31.7	55.8	38.3	0.0	0.5	7.4	56.8	27.2	0.0
Q4	0.2	4.9	18.5	43.1	17.1	1.0	17.6	22.0	30.4	31.8	1.1	14.7	17.6	22.7	44.4	0.3	10.9	25.8	45.7	52.5	0.1	2.3	15.4	45.7	43.1
Q5	0.0	0.6	9.2	21.1	82.9	0.2	12.8	14.0	23.9	59.1	0.4	7.8	19.4	9.1	44.4	0.1	4.0	14.7	16.0	47.5	0.0	0.7	3.0	27.2	56.9
Wards	7684	1160	292	123	41	8819	313	100	46	22	8765	374	108	44	9	8580	404	163	94	59	7519	1241	331	151	58
Neighbourhood ethnic concentration (2011)																									
Q1	94.6	42.6	6.1	0.0	0.0	90.0	14.4	0.0	0.0	0.0	89.9	23.3	9.6	0.0	0.0	92.3	19.1	1.0	0.0	0.0	93.5	23.4	3.0	0.0	0.0
Q2	3.3	35.3	53.4	16.3	0.0	6.5	38.7	35.6	3.1	0.0	6.7	30.9	21.1	13.0	0.0	5.8	42.9	29.8	4.7	0.0	5.0	44.0	33.8	13.2	5.3
Q3	1.3	13.2	22.8	30.2	1.8	2.3	18.6	29.6	29.7	3.4	1.9	25.6	26.3	10.9	10.0	1.1	20.0	34.6	50.0	15.0	0.9	16.7	31.6	51.2	20.0
Q4	0.6	7.0	13.6	29.5	19.3	1.0	15.9	17.0	39.1	20.7	1.0	13.5	27.2	26.1	35.0	0.4	8.8	20.4	36.8	65.0	0.3	8.9	16.2	25.6	64.0
Q5	0.2	1.9	4.1	24.0	78.9	0.2	12.3	17.8	28.1	75.9	0.5	6.7	15.8	50.0	55.0	0.4	9.2	14.1	8.5	20.0	0.4	6.9	15.4	10.1	10.7
Wards	7303	787	294	129	57	8009	333	135	64	29	7944	446	114	46	20	7768	445	191	106	60	7628	504	234	129	75

Source: Author's own calculations based on aggregated census data for England and Wales.

Table A2: Probability of being in a neighborhood with low ethnic concentration and middle/low deprivation* in 2011. Average Marginal Effects; full models.

	Neighborhood ethnic concentration		Neighborhood deprivation	
	M1	M2	M1	M2
Ethnic group (ref. white British)				
Indian	-0.128 (0.009)***	-0.072 (0.007)***	-0.081 (0.009)** *	-0.046 (0.009)***
Pakistani	-0.227 (0.016)***	-0.146 (0.014)***	-0.225 (0.017)** *	-0.148 (0.016)***
Bangladeshi	-0.226 (0.030)***	-0.137 (0.023)***	-0.225 (0.030)** *	-0.109 (0.024)***
Caribbean	-0.198 (0.014)***	-0.125 (0.011)***	-0.218 (0.016)** *	-0.125 (0.013)***
African	-0.173 (0.032)***	-0.097 (0.024)***	-0.234 (0.043)** *	-0.154 (0.036)***
Origin neighborhood ethnic concentration (ref. quintile 1: lowest concentration)				
Quintile 2	-0.071 (0.002)***	-0.069 (0.002)***		-0.018 (0.003)***
Quintile 3	-0.173 (0.006)***	-0.170 (0.006)***		-0.028 (0.004)***
Quintile 4	-0.203 (0.008)***	-0.201 (0.008)***		-0.024 (0.005)***
Quintile 5	-0.238 (0.011)***	-0.234 (0.011)***		-0.022 (0.007)***
Origin neighborhood deprivation (ref. quintile 1: least deprived)				
Quintile 2		0.003 (0.002)	-0.019 (0.002)** *	-0.012 (0.002)***
Quintile 3		0.005 (0.002)*	-0.033 (0.002)** *	-0.018 (0.002)***
Quintile 4		0.009 (0.002)***	-0.086 (0.003)** *	-0.058 (0.003)***
Quintile 5		0.007 (0.002)**	-0.201 (0.003)** *	-0.140 (0.003)***

	Neighborhood ethnic concentration		Neighborhood deprivation	
	M1	M2	M1	M2
Tenure (ref. owner)				
Social rent		-0.009 (0.002)***		-0.037 (0.002)***
Private rent		0.004 (0.002)*		-0.007 (0.003)*
Number of cars (ref. none)				
1 car		0.010 (0.002)***		0.038 (0.002)***
2+ cars		0.011 (0.002)***		0.052 (0.003)***
Persons per room (ref. 1 ppp)				
> 1.5 persons		-0.008 (0.003)*		-0.039 (0.005)***
1.5 persons		-0.014 (0.005)**		-0.032 (0.007)***
>1 & <1.5 persons		-0.010 (0.002)***		-0.016 (0.003)***
>= 0.75 & <1 person		0.004 (0.002)*		0.009 (0.002)***
<0.75 person		0.001 (0.002)		0.014 (0.002)***
Parental social class (ref. Manual (V+VI+VII))				
No earners/No code		-0.007 (0.003)**		0.007 (0.003)
Routine non-manual (III)		-0.004 (0.002)*		0.012 (0.002)***
Petit Bourgeoisie (IV)		0.003 (0.002)		0.029 (0.003)***
Professional/Managerial (I+II)		-0.010 (0.002)***		0.016 (0.003)***
Education (ref. Level 1 or less)				
Level 2+3		0.008 (0.002)***		0.022 (0.002)***
Level 4		-0.015 (0.002)***		0.026 (0.003)***
Respondent's social class (ref. Routine)				
Petit bourgeoisie		0.008 (0.003)**		0.046 (0.004)***
Intermediate		0.001 (0.002)		0.033 (0.003)***
Service		0.001 (0.002)		0.046 (0.003)***

	Neighborhood ethnic concentration		Neighborhood deprivation	
	M1	M2	M1	M2
Civil status (ref. Single)				
White British partner		0.039 (0.002)***		0.055 (0.002)***
Other partner		-0.015 (0.004)***		0.013 (0.006)*
Children				
Has children		0.003 (0.002)		-0.008 (0.002)***
Age				
Age in destination	-0.000 (0.000)	-0.001 (0.000)***	0.000 (0.000)	-0.000 (0.000)
Gender				
Male	-0.002 (0.001)	-0.001 (0.001)	0.004 (0.002)*	0.003 (0.002)
Origin year (ref. 1971)				
1981	0.001 (0.001)	-0.001 (0.001)	0.003 (0.001)	-0.009 (0.001)***
1991	-0.014 (0.002)***	-0.013 (0.002)***	-0.011 (0.002)** *	-0.036 (0.003)***
Number of census points (ref. 3)				
4 census points	0.002 (0.004)	0.003 (0.004)	0.014 (0.006)*	0.003 (0.005)
5 census points	0.013 (0.004)**	0.009 (0.004)*	0.029 (0.006)** *	0.011 (0.006)
Constant				
	0.750*** (0.0320)	0.669*** (0.0402)	0.755*** (0.0338)	0.676*** (0.0402)
Adjusted R-squared				
	0.036	0.079	0.035	0.078
N				
	161168	161168	161168	161168

Robust (clustered) standard errors in parentheses

*** p<0.01 ** p<0.05 * p<0.1

Population: Individuals between 20 and 45 years old

Source: Author's own calculations based on ONS-LS

Table A3: Probability of being in a neighborhood with low ethnic concentration and middle/low deprivation* in 2011. Models with interactions (ethnic group and education/social class).

	Neighborhood ethnic concentration						Neighborhood deprivation					
	B	SE	P> z	B	SE	P> z	B	SE	P> z	B	SE	P> z
Ethnic group (ref. white British)												
Indian	-1.174	0.117	0.000	-1.282	0.122	0.000	-0.540	0.116	0.000	-0.659	0.117	0.000
Pakistani	-1.870	0.146	0.000	-2.196	0.156	0.000	-1.112	0.139	0.000	-1.237	0.141	0.000
Bangladeshi	-1.400	0.249	0.000	-2.024	0.253	0.000	-0.869	0.236	0.000	-0.956	0.226	0.000
Caribbean	-1.663	0.129	0.000	-1.621	0.137	0.000	-0.978	0.122	0.000	-0.873	0.129	0.000
African	-1.674	0.439	0.000	-1.538	0.519	0.003	-1.330	0.428	0.002	-1.061	0.487	0.029
Origin neighborhood ethnic concentration (ref. Q1: lowest concentration)												
Q2	-1.177	0.031	0.000	-1.172	0.031	0.000	-0.174	0.025	0.000	-0.172	0.025	0.000
Q3	-2.012	0.042	0.000	-2.005	0.042	0.000	-0.259	0.038	0.000	-0.259	0.038	0.000
Q4	-2.205	0.052	0.000	-2.191	0.052	0.000	-0.226	0.048	0.000	-0.222	0.048	0.000
Q5	-2.371	0.064	0.000	-2.373	0.065	0.000	-0.205	0.058	0.000	-0.211	0.058	0.000
Carstairs quintile (ref. Q1: least deprived)												
Q2	0.044	0.039	0.259	0.045	0.039	0.240	-0.154	0.031	0.000	-0.153	0.031	0.000
Q3	0.094	0.040	0.019	0.098	0.040	0.014	-0.224	0.032	0.000	-0.223	0.032	0.000
Q4	0.156	0.040	0.000	0.161	0.040	0.000	-0.628	0.030	0.000	-0.627	0.030	0.000
Q5	0.132	0.042	0.002	0.129	0.042	0.002	-1.222	0.030	0.000	-1.222	0.030	0.000
Tenure (ref. owner)												
Social rent	-0.179	0.032	0.000	-0.176	0.032	0.000	-0.351	0.021	0.000	-0.351	0.021	0.000
Private rent	0.072	0.042	0.087	0.078	0.042	0.064	-0.077	0.030	0.010	-0.076	0.030	0.011
Number of cars (ref. none)												
1 car	0.181	0.029	0.000	0.184	0.029	0.000	0.355	0.019	0.000	0.355	0.019	0.000
2+ cars	0.206	0.043	0.000	0.204	0.043	0.000	0.508	0.033	0.000	0.507	0.033	0.000
Persons per room (ref. 1 ppp)												
> 1.5 persons	-0.137	0.058	0.018	-0.150	0.058	0.010	-0.332	0.041	0.000	-0.338	0.041	0.000
1.5 persons	-0.243	0.083	0.003	-0.250	0.083	0.003	-0.277	0.057	0.000	-0.279	0.057	0.000
>1 & <1.5 persons	-0.174	0.040	0.000	-0.172	0.040	0.000	-0.144	0.027	0.000	-0.143	0.027	0.000
>= 0.75 & <1 person	0.080	0.034	0.019	0.077	0.034	0.023	0.086	0.023	0.000	0.085	0.023	0.000
<0.75 person	0.030	0.035	0.380	0.025	0.035	0.469	0.145	0.024	0.000	0.143	0.024	0.000
Parental social class (ref. Manual (V+VI+VII))												

	Neighborhood ethnic concentration						Neighborhood deprivation					
	B	SE	P> z	B	SE	P> z	B	SE	P> z	B	SE	P> z
Not codeable/No earners in hh	-0.124	0.048	0.009	-0.123	0.047	0.010	0.063	0.033	0.056	0.063	0.033	0.053
Routine non-manual (III)	-0.081	0.035	0.022	-0.074	0.035	0.036	0.116	0.024	0.000	0.117	0.024	0.000
Bourgeoisie (IV)	0.061	0.046	0.186	0.069	0.047	0.136	0.295	0.033	0.000	0.296	0.033	0.000
Professional/Managerial (I=II)	-0.190	0.035	0.000	-0.191	0.035	0.000	0.158	0.027	0.000	0.158	0.027	0.000
Education (ref. Level 1 or less)												
Level 2+3	0.182	0.036	0.000	0.169	0.034	0.000	0.218	0.024	0.000	0.212	0.023	0.000
Level 4+	-0.365	0.042	0.000	-0.269	0.040	0.000	0.212	0.034	0.000	0.244	0.033	0.000
Respondent's social class (ref. Routine)												
Petit bourgeoisie	0.167	0.061	0.006	0.100	0.063	0.112	0.451	0.043	0.000	0.441	0.044	0.000
Intermediate	0.013	0.042	0.751	-0.012	0.045	0.787	0.306	0.030	0.000	0.312	0.032	0.000
Service	0.026	0.036	0.470	-0.045	0.038	0.237	0.448	0.026	0.000	0.427	0.027	0.000
Civil status (ref. Single)												
White British partner	0.738	0.031	0.000	0.740	0.031	0.000	0.519	0.022	0.000	0.519	0.022	0.000
Other partner	-0.168	0.058	0.004	-0.200	0.058	0.001	0.128	0.054	0.018	0.111	0.053	0.038
Has children	0.065	0.032	0.044	0.061	0.032	0.056	-0.081	0.022	0.000	-0.082	0.022	0.000
Age	-0.011	0.003	0.000	-0.011	0.003	0.000	-0.003	0.002	0.096	-0.004	0.002	0.086
Male	-0.016	0.028	0.580	-0.012	0.029	0.670	0.025	0.020	0.210	0.027	0.020	0.182
Number of census points (ref. 3)												
4	0.040	0.067	0.551	0.038	0.068	0.574	0.022	0.052	0.664	0.022	0.052	0.666
5	0.152	0.073	0.036	0.152	0.073	0.037	0.101	0.055	0.067	0.102	0.055	0.064
Origin year (ref. 1971)												
1981	-0.019	0.021	0.377	-0.020	0.021	0.361	-0.092	0.014	0.000	-0.093	0.014	0.000
1991	-0.243	0.034	0.000	-0.245	0.034	0.000	-0.334	0.023	0.000	-0.334	0.023	0.000
Interactions ethnic group*Education												
Indian*Level 2+3	-0.158	0.152	0.298				-0.130	0.152	0.392			
Indian*Level 4+	0.570	0.145	0.000				0.499	0.153	0.001			
Pakistani*Level 2+3	-0.210	0.214	0.327				-0.158	0.203	0.435			
Pakistani*Level 4+	0.950	0.203	0.000				0.242	0.197	0.218			
Bangladeshi*Level 2+3	-0.504	0.373	0.176				-0.015	0.336	0.965			
Bangladeshi*Level 4+	0.079	0.406	0.845				0.090	0.368	0.807			
Caribbean*Level 2+3	0.038	0.187	0.839				-0.094	0.178	0.600			
Caribbean*Level 4+	0.689	0.193	0.000				0.255	0.188	0.176			
African*Level 2+3	-0.412	0.620	0.507				0.648	0.620	0.296			

	Neighborhood ethnic concentration						Neighborhood deprivation					
	B	SE	P> z	B	SE	P> z	B	SE	P> z	B	SE	P> z
African*Level 4+	1.071	0.513	0.037				0.131	0.503	0.795			
Interactions ethnic group*social class												
Indian*Petit bourgeoisie				0.409	0.263	0.121				0.078	0.270	0.774
Indian*Intermediate				0.241	0.182	0.186				0.182	0.181	0.313
Indian*Service				0.496	0.143	0.001				0.521	0.146	0.000
Pakistani*Petit bourgeoisie				1.488	0.296	0.000				0.546	0.292	0.061
Pakistani*Intermediate				0.334	0.259	0.196				-0.067	0.240	0.779
Pakistani*Service				1.069	0.210	0.000				0.359	0.196	0.068
Bangladeshi*Petit bourgeoisie				0.898	0.574	0.118				0.704	0.575	0.221
Bangladeshi*Intermediate				0.882	0.463	0.057				-0.372	0.473	0.431
Bangladeshi*Service				0.811	0.385	0.035				0.320	0.332	0.335
Caribbean*Petit bourgeoisie				-0.726	0.458	0.113				-0.525	0.383	0.171
Caribbean*Intermediate				0.082	0.216	0.705				-0.258	0.204	0.208
Caribbean*Service				0.450	0.183	0.014				0.044	0.175	0.801
African*Petit bourgeoisie				0.909	1.041	0.383				0.179	1.076	0.868
African*Intermediate				0.461	0.672	0.493				0.137	0.639	0.831
African*Service				0.373	0.589	0.527				-0.143	0.554	0.796
Constant	3.183	0.118	0.000	3.198	0.118	0.000	1.767	0.086	0.000	1.772	0.086	0.000
N	161168			161168			161168			161168		

B-coefficients, robust (clustered) standard errors and p-values

Population: Individuals between 20 and 45 years old

Source: Author's own calculations based on ONS-LS

Table A4: Probability of being in a neighborhood with low ethnic concentration and middle/low deprivation* in 2011. Models with interactions (ethnic group and origin neighborhood).

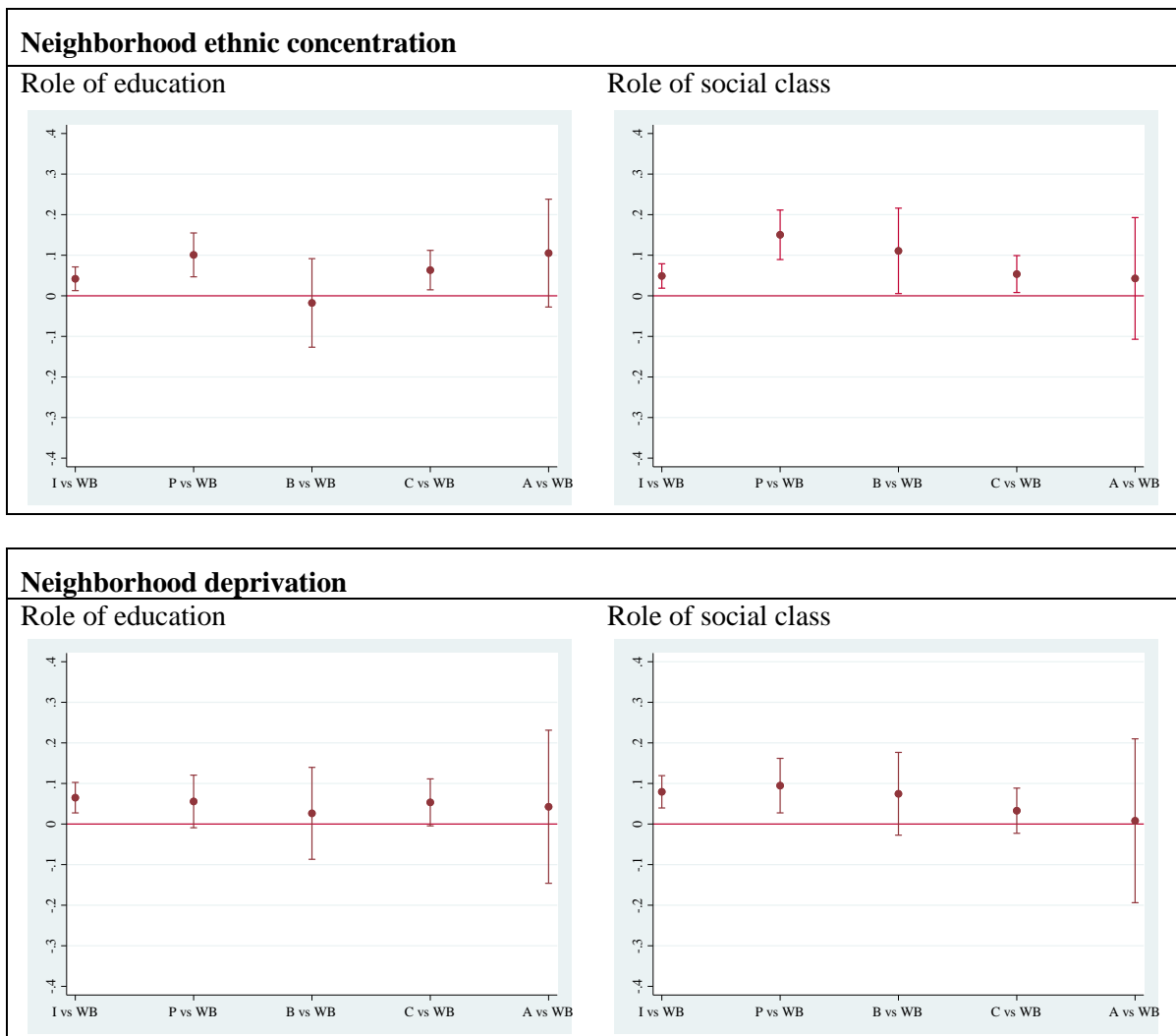
	Neighborhood ethnic concentration			Neighborhood deprivation		
	B	SE	P> z	B	SE	P> z
Ethnic group (ref. white British)						
Indian	-1.007	0.125	0.000	-0.362	0.083	0.000
Pakistani	-1.974	0.186	0.000	-1.103	0.108	0.000
Bangladeshi	-1.610	0.323	0.000	-0.904	0.176	0.000
Caribbean	-1.253	0.183	0.000	-0.704	0.099	0.000
African	-1.901	0.557	0.001	-0.581	0.277	0.036
Origin neighborhood ethnic concentration (ref. Q1: lowest concentration)						
Q2	0.127	0.091	0.164	-0.173	0.025	0.000
Q3	0.302	0.087	0.001	-0.322	0.038	0.000
Q4	1.165	0.086	0.000	-0.286	0.048	0.000
Q5	2.345	0.084	0.000	-0.259	0.060	0.000
Carstairs quintile (ref. Q1: least deprived)						
Q2	0.048	0.039	0.213			
Q3	0.103	0.040	0.010			
Q4	0.165	0.040	0.000			
Q5	0.134	0.042	0.001			
Carstairs quintile (ref. Q5: most deprived)						
Q1-4				0.913	0.020	0.000
Tenure (ref. owner)						
Social rent	-0.156	0.032	0.000	-0.336	0.021	0.000
Private rent	0.092	0.042	0.030	-0.045	0.030	0.131
Number of cars (ref. none)						
1 car	0.185	0.029	0.000	0.390	0.019	0.000
2+ cars	0.204	0.043	0.000	0.596	0.033	0.000
Persons per room (ref. 1 ppp)						
> 1.5 persons	-0.162	0.058	0.005	-0.333	0.041	0.000
1.5 persons	-0.258	0.082	0.002	-0.283	0.057	0.000
>1 & <1.5 persons	-0.178	0.039	0.000	-0.147	0.027	0.000
>= 0.75 & <1 person	0.074	0.034	0.030	0.092	0.023	0.000
<0.75 person	0.019	0.035	0.579	0.164	0.024	0.000
Parental social class (ref. Manual (V+VI+VII))						
Not codeable/No earners in hh	-0.124	0.047	0.009	0.063	0.033	0.056
Routine non-manual (III)	-0.072	0.035	0.041	0.128	0.024	0.000
Bourgeoisie (IV)	0.075	0.047	0.105	0.314	0.033	0.000
Professional/Managerial (I=II)	-0.194	0.035	0.000	0.201	0.027	0.000
Education (ref. Level 1 or less)						
Level 2+3	0.165	0.033	0.000	0.211	0.023	0.000
Level 4+	-0.264	0.040	0.000	0.258	0.033	0.000
Respondent's social class (ref. Routine)						

	Neighborhood ethnic concentration			Neighborhood deprivation		
	B	SE	P> z	B	SE	P> z
Petit bourgeoisie	0.165	0.060	0.006	0.458	0.043	0.000
Intermediate	0.011	0.042	0.785	0.314	0.030	0.000
Service	0.027	0.036	0.451	0.459	0.026	0.000
Civil status (ref. Single)						
White British partner	0.736	0.031	0.000	0.514	0.022	0.000
Other partner	-0.211	0.057	0.000	0.118	0.053	0.026
Has children	0.061	0.032	0.056	-0.091	0.022	0.000
Age	-0.011	0.003	0.000	-0.003	0.002	0.107
Male	-0.015	0.028	0.602	0.027	0.020	0.185
Number of census points (ref. 3)						
4	0.059	0.067	0.373	0.027	0.051	0.604
5	0.172	0.072	0.017	0.103	0.055	0.059
Origin year (ref. 1971)						
1981	-0.017	0.021	0.432	-0.119	0.014	0.000
1991	-0.242	0.034	0.000	-0.372	0.023	0.000
Interactions ethnic group*origin neighborhood ethnic concentration						
Indian*quintile 2	0.084	0.164	0.608			
Indian*quintile 3	0.142	0.163	0.385			
Indian*quintile 4	0.003	0.178	0.986			
Indian*quintile 5	-0.469	0.246	0.056			
Pakistani*quintile 2	0.413	0.237	0.081			
Pakistani*quintile 3	0.610	0.239	0.011			
Pakistani*quintile 4	0.553	0.253	0.029			
Pakistani*quintile 5	0.278	0.366	0.446			
Bangladeshi*quintile 2	-0.358	0.472	0.449			
Bangladeshi*quintile 3	0.286	0.427	0.504			
Bangladeshi*quintile 4	0.565	0.464	0.223			
Bangladeshi*quintile 5	-0.075	0.639	0.906			
Caribbean*quintile 2	-0.059	0.225	0.793			
Caribbean*quintile 3	-0.171	0.223	0.444			
Caribbean*quintile 4	-0.359	0.238	0.132			
Caribbean*quintile 5	-0.728	0.310	0.019			
Black African*quintile 2	0.767	0.628	0.222			
Black African*quintile 3	1.213	0.640	0.058			
Black African*quintile 4	0.565	0.744	0.448			
Black African*quintile 5	-0.531	0.874	0.544			
Interactions ethnic group*neighborhood deprivation						
Indian*quintile 1-4				-0.126	0.123	0.305
Pakistani*quintile 1-4				0.079	0.169	0.640
Bangladeshi*quintile 1-4				0.427	0.335	0.202

	Neighborhood ethnic concentration			Neighborhood deprivation		
	B	SE	P> z	B	SE	P> z
Caribbean*quintile 1-4				-0.524	0.126	0.000
African*quintile 1-4				-0.920	0.338	0.007
Constant	0.797	0.144	0.000	0.518	0.084	0.000
N	161168			161168		

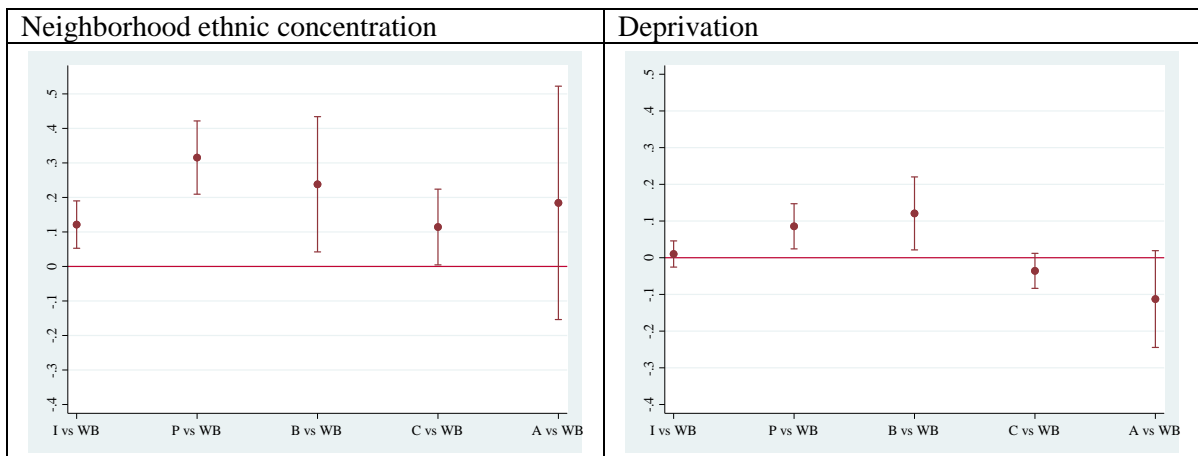
B-coefficients, robust (clustered) standard errors and p-values
 Population: Individuals between 20 and 45 years old
 Source: Author's own calculations based on ONS-LS

Figure A1: Contrasts* showing the role of education and social class



Population: Individuals between 20 and 45 years old
 Source: Author's own calculations based on ONS-LS
 WB=white British; I=Indian; P=Pakistani; B=Bangladeshi; C=Caribbean; A=African
 *When confidence intervals do not cross the zero line, it means that the effect of education/social class on the outcome variable is different between the groups compared at a p-value<0.05.

Figure A2: Contrasts* showing the role of origin neighborhood



Population: Individuals between 20 and 45 years old

Source: Author's own calculations based on ONS-LS

WB=white British; I=Indian; P=Pakistani; B=Bangladeshi; C=Caribbean; A=African

*When confidence intervals do not cross the zero line, it means that the effect of education/social class on the outcome variable is different between the groups compared at a p-value<0.05.

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