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Diversity and Neighbourhood Satisfaction

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Abstract
This paper investigates the impact of ethnic diversity on individuals' overall satisfaction with and other aspects of their neighbourhood. It uses panel data and a variety of empirical methods to control for potential endogeneity of diversity and of the location choices. We find that a higher white share in the neighbourhood raises overall satisfaction with the neighbourhood in our (overwhelming white) sample, but has no significant impact on generalised trust or other commonly-used measures of social capital. We suggest that part of the impact of diversity on overall neighbourhood satisfaction may be through an effect on a fear of crime and the quality of social life.

Keywords: neighbourhood satisfaction, social capital, diversity, deprivation
JEL codes: Z1

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Introduction

Sizeable parts of the population of most Western countries seem troubled by increased ethnic diversity in their societies. For many people, the most direct impact of these changes is felt in their communities and this paper is about how ethnic diversity within neighbourhoods affects a variety of measures of people's satisfaction with their local areas. We consider the impact on overall satisfaction with the neighbourhood, the intention to move, actual residential mobility, trust in others, activity in organizations (these two being commonly used measures of 'social capital' e.g. Putnam, 2000), perceptions of crime, the quality of social life and local services.

There is a large and growing literature on related issues. Some have argued that greater diversity erodes trust (Putnam, 2007; Dinesen and Sonderskov, 2012), lowers involvement in organizations (Alesina and La Ferrara, 2000, 2002; Costa and Kahn, 2003), lowers the level of social cohesion (see the survey by Van der Meer and Tolsma, 2014), lowers the level of public good provision (see Alesina, Baqir and Easterly, 1999; the review by Alesina and La Ferrara, 2005), lowers the quality of government (Alesina and Zhuravskhaya, 2011) or changes attitudes to redistribution (Dahlberg, Edmark and Lundquvist, 2012).

The studies cited above have been controversial and subject to a number of criticisms (see Portes and Vickstrom, 2011, for an overview). First, there is the possibility that the observed correlations of diversity and trust are caused by confounding factors - which might be at individual or neighbourhood level. For example, the Moving To Opportunity (MTO) evaluations (Kling, Liebmann and Katz, 2007, Ludwig et al , 2012, and Chetty, Hendren and Katz, 2016) have found important effects of neighbourhood poverty on subjective well-being, mental health and long-term child outcomes and Laurence and Heath (2008) argue that deprivation is an important confounder in the UK. In addition, Uslaner, (2012) argues that it is segregation rather than diversity that is important, while Tesei (2014) points to the importance of racial income inequality.

Secondly, most studies in this area rely on correlations in cross-sectional data in which causality is not clearly proved (Portes and Vickstrom, 2011), although there are some exceptions. For example, Algan, Hemet and Laitin (2016) exploit the random assignment of tenants to apartment blocks in France to investigate the impact of ethnic diversity on social relationships and housing quality. In the US, the MTO experiment (Kling, Liebmann and Katz, 2007, Ludwig et al , 2012, and Chetty, Hendren and Katz, 2016) exploits the random provision

of housing vouchers to encourage low-income families to more to lower-poverty neighbourhoods.

This paper makes a number of contributions to this literature. Using longitudinal data for the period 1991-2014 from the British Household Panel Study (BHPS) [1] and its successor Understanding Society (UKHLS)[2], we investigate the impact of ethnic diversity on a wider range of measures of neighbourhood satisfaction than is common in most of the existing literature. The UK is an interesting country to study these issues as the last 25 years have seen substantial change in the structure of the population, which means that many neighbourhoods have undergone quite sizeable changes. The fraction of the population that is non-white has risen from 5% in the 1991 census to 15.5% in the 2011 census.

The main outcome that we consider is overall satisfaction with the neighbourhood, but we also consider generalised trust, activity in organizations, fear of crime, satisfaction with social life and the quality of local services. We focus on ethnic diversity as our variable of interest, but we also control for a variety of other neighbourhood characteristics. In particular we pay close attention to controlling for neighbourhood deprivation as the relative impact of diversity and deprivations has been the focus of intense discussion in the UK (Laurence and Heath, 2008; Letki, 2008; Andrews, 2009; Fieldhouse and Cutts, 2010; Twigg, Taylor and Mohan, 2010; Laurence, 2011; Becares et al, 2011; Sturgis et al, 2011; Demireva and Heath, 2014).

The paper also makes a contribution in taking seriously the problems of establishing causality from diversity to neighbourhood satisfaction. First, the use of longitudinal data allows us to control for individual and neighbourhood fixed effects. Second, we instrument for diversity using a 'Bartik-style' instrument (Bartik, 1991). Third, we develop an empirical approach to control for the possible selection bias caused by the endogeneity of residential choice. We hope that in addressing these empirical issues, we make some progress in providing causal estimates of the impact of diversity. Throughout, we report a wide variety of specifications (including some very demanding ones) in order to convey the robustness (or lack of it) of our empirical findings.

[1] University of Essex. Institute for Social and Economic Research. (2014). *British Household Panel Survey, Waves 1-18, 1991-2009: Special Licence Access, Lower Layer Super Output Areas and Scottish Data Zones*. [data collection]. *3rd Edition.* UK Data Service. SN: 6136, http://dx.doi.org/10.5255/UKDA-SN-6136-2

[2] University of Essex. Institute for Social and Economic Research, NatCen Social Research, Kantar Public. (2016). *Understanding Society: Waves 1-6, 2009-2015: Special Licence Access, Census 2001 Lower Layer Super Output Areas*. [data collection]. *7th Edition.* UK Data Service. SN: 6670, http://dx.doi.org/10.5255/UKDA-SN-6670-7

The plan of the paper is as follows. In the next section we describe the individual data that we use, and introduce the outcome measures we study. The third section presents the neighbourhood data used. We discuss how one might measure the diversity of neighbourhoods arguing that it is difficult to disentangle the many possible measures because of a high degree of collinearity between them. In the end, our main estimates use the white share of the population in the neighbourhood as our measure of diversity, though an Appendix presents estimates with alternative measures and the qualitative conclusions are very similar. The fourth section describes our empirical methodology detailing in particular the way in which we control for the endogeneity of neighbourhood characteristics for individuals that is the result of residential choice. In this section we also discuss the instruments we use for the diversity measure.

The fifth section reports our basic results for satisfaction with the neighbourhood (Letki, 2008, also uses a similar measure as part of her composite 'neighbourhood attitude' variable). In most of our specifications we find that neighbourhood satisfaction among our sample (which is overwhelmingly white) is significantly positively related to the white share of the population, and that our result is robust to alternative estimation methods. The sixth section presents evidence that neighbourhood satisfaction does predict intention to move and actual residential moves, hopefully allaying fears that responses to a subjective neighbourhood satisfaction question are unreliable. The seventh section considers outcomes that have often been studied in the social capital literature (trust, and activity in organizations) – we find no significant, robust, relationship with diversity. The eighth section considers satisfaction with particular aspects of the neighbourhood - perceptions of crime, and quality of local services and social life. On perceptions of crime, we generally find negative effects of the white share. Results on the quality of services and of social life are more mixed though there is some evidence that a higher white share is associated with a higher quality of social life. The ninth section attempts to provide an account of the transmission mechanism from neighbourhood characteristics to overall satisfaction with the neighbourhood. These estimates cannot be thought of as causal but we argue that they are interesting. We show that neighbourhood satisfaction does appear to be significantly related to perceptions of crime, the perceived quality of local services and social life and the level of social capital. So all of these channels may play an important role in explaining how diversity affects neighbourhood satisfaction.

Our main conclusions are that diversity seems to influence neighbourhood satisfaction and that fear of crime may be an important channel for this.

2. Individual Data

This study uses information from two longitudinal British surveys, the British Household Panel Survey (BHPS) and its successor, Understanding Society (UKHLS)[3]. They follow the same representative sample of households over time, interviewing all individuals aged 16 or above[4]. BHPS started in 1991 and lasted for 18 waves, finishing in 2008. The first wave included around 10,300 individuals from 5,500 households in Great Britain[5]. UKHLS started in 2009, and is still ongoing. The first wave surveyed individuals from approximately 40,000 households. Since 2010, UKHLS also includes the whole BHPS panel[6] that, at the time, surveyed individuals from about 8,000 households. Together, they allow construction of a panel that covers more than 20 years. They include a wide variety of detailed questions on perceptions and attitudes towards the neighbourhood where people live. Unfortunately, not all questions appear in each year and there is no year in which all questions of potential interest appear[7] – this has implications for our empirical enquiry that we discuss below. Table 1 presents descriptive statistics on the variables, grouped into broad categories. First, there is our main question of interest – overall, whether you like your present neighbourhood – 92.6% of people do. We also consider the fraction who plan to stay in their current neighbourhood (69%) and the actual mobility from one year to the next (6.7%). The next panel of Table 1 considers some measures of social capital – generalized trust, whether active in or member of at least one organization and whether one is willing to improve one's neighbourhood. The third panel of Table 1 presents measures relating to the perception of crime, both an overall worry about being a victim of crime (47.8% of people are) as well as fears about specific types of crime. As a summary index of fear of crime we use the overall "worry" question as this has the largest sample size having been a question in more waves of the survey. The fourth panel of Table 1 summarizes responses to questions about the quality of local services – schools, medical, transport, shopping and leisure. The final panel of Table 1 summarizes measures relating to the quality of social life – interactions and friendships with neighbours etc. We also

[3] These studies have a similar sample structure to the PSID in the US, though ask a wider range of questions on social attitudes.
[4] Since 1994, BHPS includes a short module for individuals aged 11-15.
[5] Following the first wave sampling, new entrants in the sample are mainly represented by people reaching the minimum age for the interview and people joining the original households. Additional samples of households from Scotland and Wales were included in 1999, and for Northern Ireland in 2001.
[6] The attrition rate for the BHPS panel between 2008 and 2010 was of 20%.
[7] Table B1 in the Appendix lists the relevant questions and the waves in which they appear.

combine measures of social capital, quality of local services, and quality of life in separate indices that are constructed using the first principal component of each group of variables. Principal component analysis results are reported in Table B2 of the Appendix.

Although they are not the focus of interest we also include individual-level controls as regressors in most of our specifications – these are summarized in Table 2. The individual-level controls comprise information on age, working status, housing status, education level, gender, marital status, number of children, and a dummy variable for being non-white.

3. Neighbourhood level data

The geo-coded versions of the BHPS and UKHLS also contain detailed information on the residence of the respondents in each wave, specifically the Lower Super Output Area (LSOA) level[8] that will be our main geographical reference. There are 40,880 LSOAs in Britain[9], containing on average 1,416 people[10]. The sample size of BHPS/UKHLS is too small to be able to compute reliable neighbourhood characteristics at this spatial scale so we use other data sources to measure them, mostly the decennial censuses, 1991-2011 inclusive.

Measuring Diversity

The main variable of interest in our study is ethnic diversity. The number of ethnic groups categorized varies across censuses and in our analysis we use nine groups that can be defined on a consistent basis - White, Indian, Pakistani, Bangladeshi, Chinese, Black Caribbean, Black African, other Asian, other Black, and a residual category grouping together all other ethnicities. We impute values for the inter-censual years using linear interpolation for each area. We use information from 1991 and 1971 censuses to construct two instrumental variables for the ethnic mix, respectively, as explained in the following section.

The existing literature uses a variety of measures to summarize the ethnic mix of an area. One popular measure is the fractionalization index (see e.g. Alesina and La Ferrara, 2000), that is defined as:

[8] LSOAs were created from 2001 census of population to improve the reporting of small area statistics, they were then revised according to 2011 census. Both BHPS and UKHLS contain information at the 2001 LSOA level. In 2001, LSOAs in England and Wales were constructed to have a minimum of 1,000 inhabitants, and 400 households, and a maximum of 3,000 inhabitants, and 1,200 households. Scotland designed statistical areas following the same criteria. Where other area codes were available, information was harmonised using Postcodes Directories (EDINA, University of Edinburgh) and Postcode Headcounts (Office for National Statistics).

[9] 32,476 of which are in England, 6,502 in Scotland, and 1,896 in Wales. Northern Ireland is excluded from this analysis.

[10] This datum refers to the 1991 *Census of Population*.

$$FRAC_a = 1 - \sum_i s_{ia}^2 \quad (1)$$

where S_{ia} is the share of ethnic (or country-of-birth) group i in the population area a. This can be interpreted as the chance that two randomly chosen people in the area belong to different groups[11]. But the fractionalization index is simply one of many possible ways in which the ethnic mix of a neighbourhood might affect outcomes. It might be that it is only the share of one's own ethnic groups that is important or it might be the shares of particular ethnic groups. Or it might also be that it is the immigrant share rather than the ethnic group that is important. Historically most minorities were migrants and most migrants were minorities. But this correlation has weakened over time – many minorities are now UK–born and there has been substantial white immigration into the UK following the accession of the Eastern European A8 countries into the EU in 2004.

In principle one can distinguish between these different hypotheses by conducting a 'horse race', testing one measure against another and seeing which has the greatest explanatory power. In practice we do not have enough power in the data to resolve this question beyond reasonable doubt as there is a high degree of collinearity between diversity measures as shown in Table 4[12]. For instance, the correlation between the white share and the ethnic fractionalization index is -0.96 because there are only a small number of neighbourhoods where the minority share is very high[13]. The practical implication is that one cannot distinguish clearly between the hypothesis that it is the white share that is the relevant neighbourhood characteristic or the fractionalization index. This is in spite of the fact that these have different implications e.g. a linear effect of the white share implies a monotonic relationship between the white share and outcomes while the fractionalization index does not – however the values of the white share where they are different is sparse in our data.

After some experimentation we decided to use the white share as the diversity measure in our main specification as this can be considered a parsimonious model for diversity that seems to work best for most specifications (see Becares et al, 2011, for another study that uses ethnic group shares as the diversity measure). But we recognize that others might prefer other

[11] An alternative interpretation is that individuals put a positive weight on their own-group share so that the 'treatment' effect varies across ethnic groups within their neighbourhood and the fractionalization index is then the average treatment effect across neighbourhoods.
[12] Information on the country of birth is also available for 1991-2011 censuses but the country of birth classification changes quite extensively across censuses. To estimate the migrant mix we use 4 groups that are consistently available throughout all censuses – United Kingdom, Ireland, Europe, and Other countries.
[13] Less than 1% of the LSOAs has a proportion of white people that is lower than 50% of whites in 1991, and, even though the migration influx has been quite pervasive over time, only 5% of areas had less than 50% of white residents in 2011.

variables and the Appendix includes a variety of alternative specifications – including the fractionalization index, the shares of people in the other ethnic groups as additional variables, as well as the share of migrants and the share of Muslims.

One other issue that we do not explore is the difference between fractionalization and segregation (e.g. see Uslaner, 2012; Alesina and Zhuravskhaya, 2011). In this literature fractionalization (or some other measure of diversity) is typically measured at one level of spatial aggregation and the segregation is then the measure at a lower level of spatial aggregation. We choose to measure everything at as local a level as possible, although we provide some comparison with the effect of diversity calculated at different local aggregation level in the Appendix.

Other Neighbourhood Characteristics

Even though our main interest is in the measures of diversity described above, our specifications include time varying controls for deprivation, which is likely to be another factor influencing satisfaction and which has received a lot of attention in the UK literature (e.g. Demireva and Heath, 2014). For economic deprivation we use two measures. The first is the 'claimant count' (an administrative measure of the numbers claiming Job Seekers Allowance, the UK's unemployment-related benefit) normalized by the working age population so this can be interpreted as a measure of the unemployment rate and we refer to it as such. The claimant count is available at the LSOA level on an annual basis through NOMIS[14]. We include this as a control variable in all our specifications.

Our second measure is the UK government's Index of Multiple Deprivation (IMD) that combines a range of indicators of disadvantage including the claimant count. This is the measure of deprivation most commonly used in the existing literature for the UK (e.g. Demireva and Heath, 2014). The IMD is available at five-yearly intervals so has to be interpolated for intervening years. There is the concern that some of the indicators in the IMD might be considered as potential outcomes, and the IMD varies in the way it is constructed across UK countries. However, our results are robust to whether we include or exclude the IMD.

[14] This corresponded to the count of the number of people claiming Jobseeker's Allowance (JSA) from 1996 until 2012. With the introduction of the Universal Credit system in 2013, means tested elements of JSA have been replaced by this new system (Nomis, Official Labour Market Statistics).

In specifications that do not include neighbourhood fixed effects we control for some other time-fixed area characteristics, namely the baseline country of birth mix[15], the 1991 industrial composition, population density in 1991, a dummy for the urbanisation of the area in 1991, the percentage of people aged less than 16 and more than 65 in 1991, the percentage of house owner households in 1991, and the percentage of households living in social houses in the same year[16]. This is important as some studies (e.g. Sturgis et al, 2011) have argued that the estimated impacts of diversity are sensitive to the other neighbourhood controls that are included.

We now turn to the empirical specification we use.

4. Empirical Specification

We are interested in how neighbourhood characteristics, which we will call amenities (though they might be disamenities) affect an outcome variable, y. Suppose we can model the outcome variable for individual i in neighbourhood n in period t, y_{int}, as:

$$y_{int} = \beta^n a_{nt} + \beta^c x_{int}^c + u_{int} \quad (2)$$

where x_{int}^c are individual and neighbourhood characteristics, while a_{nt} represents the neighbourhood amenities of interest, namely diversity, and u_{int} residuals that might have both a neighbourhood and an individual component.

There is a number of issues associated with the estimation of (2). First it might be that even if people were randomly assigned to their neighbourhoods (which they are not), amenities of interest are correlated with unobserved individual or neighbourhood characteristics so that the errors in (2), u_{int}, are not independent of the amenities of interest a_{nt} and OLS estimation of (2) would lead to bias. One strategy for dealing with this issue is to control for a wide range of individual and neighbourhood characteristics and the longitudinal data we use is helpful in that regard as we can include individual and/or area fixed effects. But, our main strategy for dealing with this problem is to instrument for the amenities of interest (the precise instrument is

[15] Constructed upon 5 country of birth groups: United Kingdom and Europe, Africa, India, Pakistan, and Other countries, data from 1971 *Census of population*.
[16] Table 3 shows descriptive statistics for those control variables.

described later) i.e. to assume there is a set of instrumental variables z_{nt} independent of u_{int} but correlated with a_{nt}. The first-stage of this instrumental variable approach will then be:

$$a_{nt} = \pi^n z_{nt} + \pi^c x_{int} + \eta_{int} \equiv \hat{a}_{nt} + \eta_{int} \quad (3)$$

Sample Selection

Even if one assumes that the errors in (2) - u_{int} - are independent of a_{nt}, each individual is only observed in one neighbourhood in each period. The observed neighbourhood (and hence the observed amenities) is therefore likely to be correlated with u_{int} as individuals are more likely to be found in neighbourhoods with amenities that they prefer. In other words, the neighbourhood in which we observe people is the result of a choice. We do have evidence that people do respond in this way – e.g. 'white flight', the process by which some US neighbourhoods and cities rapidly became majority black (Card, Mas and Rothstein, 2008; Boustan, 2010, 2012, for the US and Kaufmann and Harris, 2015, for the UK). A less dramatic example would be the literature on how immigration into an area affects the migration decisions of natives (Borjas, 1987, 1994; Borjas, Freeman and Katz, 1996; Card and di Nardo, 2000; Card, 1990, 2001, 2005; Saiz and Wachter, 2011; Amior, 2015).

To demonstrate how we deal with the endogeneity of neighbourhood choice, substitute (3) into (2) to have:

$$y_{int} = \beta^n \hat{a}_{nt} + \beta^c x_{int}^c + \beta^n \eta_{int} + u_{int} \quad (4)$$

Now augment this by a neighbourhood selection rule. Assume that neighbourhood choice is based on the maximization of some objective function, W_{int} which is given by:

$$W_{int} = \gamma^n a_{nt} + \gamma^c x_{it}^c + \nu_{int} \quad (5)$$

Where the residuals may be correlated with (η_{int}, u_{int}) but are assumed independent of the amenity instruments z_{1nt}. Substituting (3) into (5) leads to:

$$W_{int} = \gamma^n \hat{a}_{nt} + \gamma^c x_{it}^c + \gamma^n \eta_{int} + \nu_{int} \quad (6)$$

To make progress we assume - following, Das, Newey and Vella (2003) - that the expectation of the error in (4) can be written as a function of the propensity scores, p_{int}, the probability of individual i choosing neighbourhood n, conditional on the covariates, and the neighbourhood

being chosen. In the non-binary case, this will generally be the probabilities of choosing all neighbourhoods, not just the chosen one[17]. That is one can write (4) as:

$$E[y_{int}|X_{int}, D_{int} = 1] = \beta^n \hat{a}_{nt} + \beta^c x_{int}^c + \lambda(p_{i1t}, \dots, p_{iNt}) \quad (7)$$

where are X_{int} all the individual and area level characteristics for which we control, and D_{int} is a binary variable taking the value 1 if individual i is observed in neighbourhood n at time t. The final term can be thought of as a more complicated version of the familiar sample selection correction term popularized by Heckman. Using (6), the propensity scores can be written in the following form:

$$p_{ijt} = p_j[\gamma^n(\hat{a}_{1t} - \hat{a}_{nt}), \dots, \gamma^n(\hat{a}_{Nt} - \hat{a}_{nt})] \quad (8)$$

The propensity scores have this form because only the differences in the values of amenities affect choices, while the individual characteristics cancel out. In our context, where the number of neighbourhoods that an individual might choose is very large, it is not feasible to estimate (7) and (8) in its general form. Our approach is to approximate the terms using a linear form. That is, we write (7) as:

$$E[y_{int}|X_{int}, D_{int} = 1] = \beta^n \hat{a}_{nt} + \beta^c x_{int}^c + \sum_{j \neq n} \omega_{nj}[\gamma^n(\hat{a}_{1t} - \hat{a}_{nt})] \quad (9)$$

where ω_{nj} is the weight put on the relative amenity of neighbourhood j in influencing the sample selection term for neighbourhood n. It is natural to assume that more distant neighbourhoods have less influence and we assume that the weights have the form:

$$\omega_{nj} = e^{-\alpha d_{nj}} \quad (10)$$

Where d_{nj} is the distance between the neighbourhoods and α is a measure of the cost of distance. Using (10) in (9) leads to:

$$E[y_{int}|X_{int}, D_{int} = 1] = \beta^n \hat{a}_{nt} + \beta^c x_{int}^c + \beta^a \left(\hat{a}_{(\therefore n)t} - \hat{a}_{nt}\right) \quad (11)$$

Where:

$$\hat{a}_{nt} = \sum_{j \neq n} e^{-\alpha d_{nj}} \hat{a}_{jt} \quad (12)$$

[17] This might seem an arbitrary assumption but it is satisfied by all the most commonly used discrete choice models. See Das, Newey and Vella (2003) for details.

i.e. the sample selection correction term is a function of the difference between the chosen neighbourhood amenities and a weighted average of other neighbourhood amenities. The intuition behind (11) is that the sample selection issue can be absorbed by including a term that measures the difference in amenities between this neighbourhood and others that might have been included in the choice process. In implementing (12) we use a value α=1 though our results are not sensitive to this choice over plausible values.

Equation (11) is not quite estimable because it includes the predicted values for the endogenous amenities. To estimate the model, we replace with the actual value of the amenities and instrument using the chosen instrument. For the own neighbourhood we use the own-neighbourhood instrument and for the relative amenities we use the equivalent relative instrument.

Instrumental variable

The amenity that we are focusing on is a function of the ethnic mix of the neighbourhood. As an instrument for that we use a 'Bartik' style variable (Bartik, 1991).

This type of instruments builds on the idea that, for historical reasons, area varies in terms of ethnic composition. Denote by μ_{gnt} the share of minority group g in employment in neighbourhood n in year t. The ethnic mix measures we use can all be written as a function of the current ethnic shares$I(\mu_{1nt,}, \dots, \mu_{Gnt})$. Our instrument for the ethnic shares is constructed in the following way. Denote by μ_{gn0} the share of minority group g in neighbourhood n in some base year. Denote by $(logP_{gt} - logP_{gt-1})$ the change in log population of minority group g at time t. Then we define the predicted ethnic mix based on national population movements as:

And we use as the instrument for the ethnic mix measure $I(\hat{\mu}_{1nt,}, \dots, \hat{\mu}_{Gnt})$. Because we want the variation to come from the national population changes and not from the initial ethnic group shares we control for the latter in levels equations when we do not have neighbourhood fixed effects.

$$\hat{\mu}_{gnt} = \frac{\mu_{gn0}(logP_{gt} - logP_{gt-1})}{\sum_{g'} \mu_{g'n0}(logP_{g't} - logP_{g't-1})} \quad (13)$$

5. Results for Overall Satisfaction with Neighbourhood

This section reports results for regressions where the dependent variable is a dummy taking value 1 for people answering *Yes* to the question *Do you like your neighbourhood?*. On average 92.6% of people do. The variable we are interested in is the white share (our measure of diversity). To convey the robustness of the results we report a wide range of specifications:

- With or without individual fixed effects, area fixed effects, individual*area fixed effects, and individual+area fixed effects
- OLS and IV
- With and without corrections for sample selection
- In levels and differences

These vary in the type of variation in diversity that is being used to estimate the effect on neighbourhood satisfaction. The results for the levels specifications are contained in Table 5 and the differences specifications in Table 6.

Levels

The first column of the top panel (which we will refer to as specification 1A) shows the results for a model estimated by OLS and without any fixed effects or sample selection effects although it does contain individual characteristics and a variety of baseline neighbourhood characteristics, as well as time varying measures of local deprivation. This specification is the closest to those estimated in most of the literature on the impact of diversity on outcomes such as the ones we consider[18]. It uses variation in the white share across the neighbourhoods chosen by different individuals and variation over time in the white share of the same neighbourhood. There is a significant positive effect of the white share on neighbourhood satisfaction – a rise of 10 percentage points in the white share is estimated to raise neighbourhood satisfaction by 1.2 percentage points. So column 1A suggests that diversity may be important. This is broadly consistent with the findings in Letki (2008) who includes neighbourhood satisfaction as one component of her 'neighbourhood attitude' index.

However, it is possible that these effects cannot be interpreted as causal, as they may be biased for a number of reasons. It may be that the types of individuals who live in more diverse areas are different in some unobserved way that also affects neighbourhood satisfaction. A natural way to explore this hypothesis is to exploit the longitudinal nature of our data and include

[18] This is not to say there are no studies that attempts to deal with endogeneity issues – for example, see Leigh (2006) and Bjørnskov (2007) for papers using an IV approach in trust equations.

individual fixed effects – results when we do so are reported in column 2A of Table 5. One is now using variation in the white share for the same individual, both form changes within neighbourhoods and changes that result from residential mobility. The diversity variable remains significantly different from zero and the estimated effect is almost double that found in column 1A. This might be what one would expect e.g. individuals who are more tolerant of diversity might be found in more diverse areas.

Column 3A reports results when neighbourhood [19] fixed effects are included. In this specification the impact of the white share is similar to that found in column 1A. In this specification one is exploiting variation in the white share within neighbourhoods over time but there might be correlations with individual characteristics. For this reason, we also compare results that include different fixed effects for each individual-area cell (Column 4A), i.e. a different fixed effect if an individual changes area. In this specification one is only using variation in the white share within neighbourhoods over time. The estimated impact of the white share is now similar to the individual fixed effect specification. Finally, column 5A includes both area and individual fixed effects – results are very close to the individual fixed effects ones.

The use of fixed effects does not entirely rule out the possibility that our results are driven by some endogeneity bias. For this reason, we introduce an instrumental variable strategy i.e. we instrument the diversity with variables that one can argue are uncorrelated with unobserved neighbourhood characteristics. The IV estimates are in specifications 1B-5B that mirror the specifications 1A-5A. The first stages are reported in Table B3 in the Appendix. The Kleibergen-Papp test statistic is reported and the values suggest that the instruments are generally very strong. The estimated coefficients are very similar to the OLS estimates though the standard errors are larger and the coefficient estimate with area fixed effects only is not significantly different from zero at conventional significance levels (the instrument becomes weaker in this case as well though still very strong). Overall, the results seem quite robust.

Even the IV estimates do not control for possible sample selection of individuals into areas and the right-hand panel of Table 5 presents estimates when a sample selection term is included along the lines of that suggested in the previous section – essentially a weighted average of the diversity variable in the surrounding neighbourhood. The coefficients on these sample selection

[19] In all text we use as a proxy for neighbourhood the Lower Super Output Area classification referred to 2001 Census of Population (ONS, 2001).

terms are reported in Table B4 in the Appendix. When the sample selection term is included, the estimated coefficients are, for the most part, similar to those in the equivalent specification without sample selection terms. This is true for both OLS and IV estimates. However, the Kleibergen-Papp test statistics do suggest that the instruments become weak once area fixed effects are included, but one should also take into account that these are very demanding specifications – there are 2 endogenous variables once the sample selection term is included as well as a great number of fixed effects.

Overall, Table 5 suggests a significant positive effect of the white share on neighbourhood satisfaction.

First Differences

Equation (2) can also be written in first-differenced form as:

$$\Delta y_{int} = \beta^n \Delta a_{n(i,t)t} + \beta^c \Delta x^c_{in(i,t)t} + \Delta u_{int} \qquad (14)$$

where we have used the fact that the time-invariant exogenous neighbourhood amenities do not change over time and have changed notation slightly so that $n(i,t)$ represents the area in which individual i lives at time t. Table 6 reports estimates for the model in this form, both OLS (Panel A) and IV (Panel B) without and with sample selection. First-differencing is an alternative way to eliminate individual fixed effects so we do not report specifications with them included. Column (1A) estimates the model by OLS and column (1B) by IV. The OLS results are in line with the results for 'levels' that an increase in the white share increases neighbourhood satisfaction (though the magnitude of the effect is larger in the differences specification) – in the IV specification the results are almost identical.

In this specification the change in diversity comes from both within-area changes over time and changes as individuals move areas. The latter source of variation might be thought to be problematic because the residential mobility decision is clearly endogenous. So, one might consider estimating a model in which the change in diversity is measured for the original area. This could be interpreted as an 'intention to treat' (ITT) estimator as some individuals can avoid the "treatment" by moving to a different area. The result of this differenced estimator (which we call the FD fixed estimator) is reported in column (2A) for the OLS estimator and column (2B) for the IV estimator. The estimated coefficients are very different from the equivalent specifications in columns (1A) and (1B). Most strikingly, the coefficient on the

white share in the OLS specification becomes negative, though not significantly different from zero.

Note that the ITT estimate does not measure how much people care about the amenities in their neighbourhood that is the main aim of our enquiry. Suppose that people did care but that residential mobility was so high and the range of neighbourhoods on offer so great that any change in the current neighbourhood that one disliked could be avoided by moving to another area. In this case the ITT estimate would be zero but it would be wrong to conclude people do not care about their neighbourhood – it would be more accurate to say that residential mobility insures them against any changes they do not like. If residential mobility itself is costly, one should not conclude that diversity is not an issue on the basis that the ITT estimate is zero.

The difference between the FD and FD-fixed estimators is puzzling as only a small fraction of people moves – 6.7% on average - in any one year and, for those who do not, the change in the neighbourhood characteristics is identical in the two specifications. This suggests that the 'movers' are rather different from the 'stayers'. For those who never move, the share who like their neighbourhood is 0.94 while for those who do move, the share is 0.88 in the period before moving and 0.92 afterwards[20], a very marked change. So the movers are likely to dominate the change in satisfaction with the neighbourhood.

One way to investigate this puzzle is to write (14) in a more general form as:

$$\Delta y_{int} = \beta_1^n\left(a_{n(i,t-1)t} - a_{n(i,t-1)t-1}\right) + \beta_2^n\left(a_{n(i,t)t} - a_{n(i,t-1)t}\right) + \beta^c \Delta x^c_{in(i,t)t} + \Delta u_{in(i,t)t} \quad (15)$$

In (15) the first term in neighbourhood amenities is the change in characteristics for the neighbourhood where one was last year – this is the term used in the fixed area estimate. The second term is the difference in characteristics today between the area where one is now and the area where one was last year. For individuals who do not move both these changes in characteristics are the same but they are different for those who do move.

Columns 3A and 3B present estimates of (15). Column 3A shows that both the white share in the current neighbourhood, and the between area difference in the white share are positive and strongly significant. This is interesting because the individuals are not experiencing the white share in that area. One could perhaps interpret it as individuals experiencing relief if they have moved away from an area that was becoming less white because they have avoided changes

[20] The most common reason that people who move point out is related to changing house (39%), followed by family-related reasons (22%), while reasons related to the neighbourhood are pointed out in the 10% of cases.

they would have been uncomfortable with. This explanation is speculative, but the results do suggest that neighbourhood satisfaction may not simply be driven by characteristics of the current neighbourhood. The results in column 3A can help explain the differences between the results in columns 1A and 2A. The results in column 3A imply that $a_{n(i,t-1)t}$ has a negative impact on current individual satisfaction – this can then explain why the coefficient on the FD-fixed difference is negative.

Finally, we also consider first-difference specifications within individual*neighbourhood pairs i.e. using only within area changes for each individual – these are reported columns 4A (for OLS) and 4B (for IV). Moreover, in this case we find that a higher white share is associated with higher neighbourhood satisfaction. The right-hand panel of Table 6 presents estimates of fixed difference specifications with sample selection corrections. The first-difference specifications are similar though the instruments become weaker once sample selection is accounted for.

Heterogeneity in Coefficients

One obvious concern with the estimates presented so far is that they assume that all individuals are affected by neighbourhood characteristics in the same way i.e. the effects are homogeneous.

First, it is quite possible that individuals prefer to be surrounded by their own ethnic group so that the coefficient on the white share would be different, possibly differently signed for whites and ethnic minorities. 89.9% of our sample is white so the estimates reported above will largely reflect their preferences but the preferences of minorities might well be different[21]. This has been explored by Becares et al (2011) who use data from the British Citizenship Survey that over-samples ethnic minorities to investigate the impact of diversity and deprivation on social cohesion.

Other differences often discussed are that the old and the less educated may be less comfortable with diversity than the young, and the more highly educated, or that home ownership is important because it affects the ability to move areas and any impact on house prices might also be a consideration.

Table 7 investigates possible heterogeneity introducing in the baseline specifications interactions of the diversity variable with individuals' ethnicity, level of education, age, and

[21] BHPS does not over-sample minorities though UKHLS does. However, UKHLS is a small part of our sample.

home ownership status[22]. We present four sets of estimates, OLS and IV, with and without individual fixed effects. Across all four specifications graduates' neighbourhood satisfaction is found to be less affected by the white share. For the non-whites, the estimates with and without fixed effects are different – without fixed effects, non-whites are less affected by the white share but with fixed effects they are more affected. There seem no significant variation by age. People who own a house seem to be more affected by diversity than private tenants once individual fixed effects are taken into account.

Other Robustness Checks

In an earlier section we discussed how it is hard to separately identify whether the right variable to measure diversity is the white share or the fractionalization index. So it is also possible that our results could really be picking up the impact of some other correlated measure of diversity. In the Appendix we explore this, presenting results for the ethnic fractionalization index (Table B5), the white share and the black share (Table B6), the white share and the Asian share (Table B7), the white share and the Pakistani/Bangladeshi share (to pick up the possible hostility towards Muslims) (Table B8) and the white share and the immigrant share (Table B9). An overall theme is that there is a robust significant impact of diversity on neighbourhood satisfaction but that the high degree of collinearity between different diversity measures means that one can be less sure about exactly which aspect of diversity is important.

In the existing UK literature (Laurence and Heath, 2008; Letki, 2008; Andrews, 2009; Fieldhouse and Cutts, 2010; Twigg, Taylor and Mohan, 2010; Laurence, 2011; Becares et al, 2011; Sturgis et al, 2011; Demireva and Heath, 2014) on the impact of diversity on social capital, there is considerable discussion of the impact of deprivation. All our estimates control for the unemployment rate as a measure of deprivation. There is perhaps some independent interest in the impact of the unemployment rate on neighbourhood satisfaction (see also, Kling, Liebmann and Katz, 2007, and Ludwig et al, 2012 for the impact of neighbourhood poverty on various measures of well-being) and these results are reported in Appendix C. There is a significant impact of unemployment on neighbourhood satisfaction in some specifications but not all. Because one might also be concerned about the endogeneity of the unemployment rate, Appendix C also reports results when it is treated as endogenous.

[22] We also considered gender but this was never significant.

We have assumed that it is the LSOA that is the appropriate level of geographical aggregation for affecting neighbourhood satisfaction. We check this using two alternative methods. Firstly, we estimate the same model using Travel to Work Areas (TTWA) fixed effects instead of neighbourhood fixed effects (Table B10 in the Appendix), finding similar results. Secondly, we control for measures of diversity calculated both at the neighbourhood and at the TTWA level and we find that the effect of neighbourhood level diversity is essentially unaltered and is the most important factor (Table B11 in the Appendix).

Because data on ethnic mix is only available at Census years we use interpolation for the intervening years. One might be concerned that this interpolation influences the results in some ways. But Table B12 in the Appendix shows that the results are very similar if we restrict attention to Census years.

Summary

Most of the specifications that we report suggest that an increase in the white share increases neighbourhood satisfaction. We find this in levels and differences, with and without individual fixed effects, allowing for endogeneity and sample selection. However, one should recognize that there are limits to how robust these conclusions are and we have tried to be open about that – when instrumental variables, area fixed effects and sample selection corrections are included the instruments become weaker, the standard errors larger and the estimated coefficients not significantly different from zero.

Most of the estimated coefficients are in the region 0.1-0.3 with perhaps a central estimate around 0.2. As the white share has fallen by about 10 percentage points in the period 1991-2011 these estimates would imply that neighbourhood satisfaction has fallen by between 1 and 3 percentage points over this period because of rising diversity. This effect is not enormous but the baseline probability is 92.6% so this is perhaps a sizeable rise in the fraction who are not satisfied with their neighbourhood.

6. Residential Mobility

One potential criticism of the analysis so far is that response to the neighbourhood satisfaction question simply reflects people's subjective response to which no significance can be attached. One way of addressing this is to consider whether responses to the neighbourhood satisfaction

question are correlated with intentions to move neighbourhood (itself subjective) and actual residential mobility[23].

In Table 8 we provide evidence that satisfaction with the neighbourhood has predictive power for the decision to move. The upper part of the table shows results for the actual moving. The dependent variable is, in fact, a dummy that takes value 1 if the person is observed in a different LSOA in time t with respect to time t-1. This is regressed on the lagged values of the neighbourhood satisfaction in columns (1) to (3). In all specifications, a higher satisfaction is associated with a lower probability of moving. The lower part of Table 8 shows that current neighbourhood satisfaction is also strongly correlated with the expression of an intention to move. Our conclusion is that responses to the neighbourhood satisfaction question are informative.

7. Social Capital

Our analysis so far has focused on the impact of diversity on the level of satisfaction with the neighbourhood. While we would argue this is an outcome of interest as a summary measure of how well the neighbourhood 'works' for individuals, much of the literature on the impact of diversity on community focuses on two measures of 'social capital' – generalized trust and activity in organizations. This section considers these two outcomes. Unlike the neighbourhood satisfaction questions these are not asked every year so the sample sizes are much smaller particularly when one includes individual fixed effects as a sizeable proportion of the sample have only one response to this question. A number of prominent authors have suggested that diversity erodes generalized trust (e.g. Putnam, 2007), a view that has been the subject of considerable controversy (e.g. Uslaner, 2012; Gerritsen and Lubbers, 2010; Gesthuize, Van der Meer and Scheepers, 2009), with no settled conclusion to date (see the review by Nannestad, 2008).

Our method for controlling for sample selection into neighbourhoods has rarely found evidence that this is important in practice, perhaps unsurprising given the low rate of residential mobility. In the interests of brevity and clarity, the estimates that follow only report specifications without controls for sample selection – though our results are very similar if they are included.

[23] If there is, as seems likely, residential sorting, we have known since the work of Schelling (1971, 1972) that there is no presumption that the resulting equilibrium is efficient. There is no strong prediction on whether there is too little or too much segregation in equilibrium but a number of studies have documented the impact of segregation on wages, rental prices, and in general on economic performance (e.g. Cutler and Glaeser, 1997, Peri and Ottaviano, 2006; Ananat, 2011; Chetty et al, 2014).

Generalized Trust

The responses to question on trust are widely used in the literature as a proxy for social capital. The upper panel of Table 9 presents results using generalised trust as the outcome variable. We find essentially no evidence that diversity affects the level of trust. A caveat is that the sample size is much smaller than that for the neighbourhood satisfaction equations because the trust question is asked less frequently. But it may be that generalised trust is not as closely linked to neighbourhood characteristics as commonly assumed, perhaps because the question asks about trust in people in general that may not be that tightly linked to the neighbourhood.

Active in Organizations

As an alternative measure of social capital we use a dummy variable taking value one for people who are active in at least one organisation - results are reported in the lower panel of Table 9. Also in this case, we find no significant impact of diversity on activity in organizations.

8. Other Neighbourhood Outcomes

So far we have investigated the impact of diversity on neighbourhood satisfaction and residential mobility. While there is some impact on overall satisfaction we have not provided any evidence on the aspects of the neighbourhood that changes that influences overall satisfaction. This section investigates this. We consider possible impacts on the perception of crime, the quality of local services and the quality of one's social life.

Fear of Crime

The questions asked about perceptions and fear of crime are listed in Table 1. For this section we only use the answers to whether the respondent worries about being a victim of crime because the sample size is largest for this question. The results are shown in Table 10 where the top panel reports OLS estimates with a variety of individual and area fixed effects and the bottom panel the equivalent specifications but using IV. The estimates suggest that a higher white share is generally associated with a significantly lower level of concern about crime.

One should note that this is fear of crime and not actual crime and these may not be the same. For example, the literature on the link between migration and crime sometimes finds an impact

on fear of crime but little impact on actual crime once one controls for labour market status (that would be expected to affect crime incentives as argued by Becker, 1968)[24].

Quality of Local Services

Table 11 does a similar exercise for the quality of local services index, which is the first principal component of the quality of local services variables in Table 1. One should note that the sample sizes for these outcomes is even smaller than for the fear of crime variable. The estimates with area fixed effects have very large standard errors. The estimates with no fixed effects or only individual fixed effects show that the coefficients on the white share are very different in OLS and IV specifications. Overall, the results for this outcome do not appear very robust.

Quality of Social Life

Table 12 does a similar exercise for the quality of social life index, which is the first principal component of the quality of social life variables in Table 1. All the estimated coefficients are positive suggesting that a high white share is associated with a higher quality of social life for our respondents. However, the standard errors are very large so that many of the estimated coefficients are not significantly different from zero.

9. A Production Function for Neighbourhood Satisfaction

So far we have documented what we have argued are the causal effects of neighbourhood characteristics on various measures of feelings about neighbourhoods, from the high level overall satisfaction to different domains such as social capital, fear of crime, quality of local services and social life. One hypothesis is that feelings about specific domains go into producing an overall satisfaction with the neighbourhood. A simple linear production function for individual i's overall satisfaction SAT_i, would be:

$$SAT_i = \sum_j \beta_j f_{ji} + \beta^c x_i + \epsilon_i \quad (16)$$

[24] Bell and Machin, (2013), provide a broader literature review on the topic, here we report some of the most recent works on the argument. In the US, Chalfin (2014) finds no causal effect of Mexican migration on crime. Spenkuch (2014) finds that there is some small effect, concentrated on property and financial crimes, and for migrants with low labour market prospects. Moheling and Piehl (2009, 2014) find that prison commitment rates for new migrants is in general lower or equal to the natives' one. Evidence from Europe has been targeted mostly in studying the EU enlargements during the 2000s (Bell, Fasani and Machin, 2013, Bianchi, Buonanno and Pinotti, 2012, Mastrobuoni and Pinotti, 2015) find modest effect of migration on property crimes only. Nunziata (2015) finds no effect on victimisation, but a significant impact on fear of crime. Sà (2015) finds that the negative effect of migration on house prices is not explained by any migration related increase in crime.

Where f_{ji} is the level of feeling about domain j for individual i. What we have estimated are the impact of neighbourhood characteristics on these feelings i.e.:

$$f_{ji} = \gamma_i a_i + \gamma_j^c x_i + u_{ji} \tag{17}$$

Substituting (17) into (16)implies that overall satisfaction can be written as:

$$SAT_i = \left[\sum_j \beta_j \gamma_j\right] a_i + \left[\beta^c + \sum_j \beta_j \gamma_j^c\right] x_i + \epsilon_i + \sum_j \beta_j u_{ji} \tag{18}$$

which is what we have also estimated. What is not identified in this estimates are the factor loadings – the β_j - on different domains in (16). These are however of some interest e.g. whether it is crime or social interactions that is the main transmission channel from neighbourhood characteristics to overall satisfaction. Ideally one would estimate (16) instrumenting the different domains using the first-stages implied by (17). However, this approach only works if we have at least as many instruments as domains and there is independent variation in the domains.

In the absence of our ability to do that, we report estimates of (16) by OLS. These estimates cannot be given a causal interpretation but we do think they are of some interest. Results that include factors[25] for the different groups of variables are reported in Table 13[26]. Columns (1), (3) and (5) report estimates of neighbourhood satisfaction on the various domain i.e. (16). Neighbourhood satisfaction is, as one might expect, positively related to social capital, quality of local services and social life and negatively related to the fear of crime though the importance of social capital does not survive the introduction of individual fixed effects suggesting it may not vary much over the life-course. The relation with deprivation is negative, but significant only when individual fixed effects are considered. Our earlier results would suggest that the impact of diversity is not through the social capital variables that has been the focus of much of the literature but through fear of crime, the quality of services and social life. Columns (2), (4) and (6) include both the diversity variables and the domain satisfaction measures showing that the white share has explanatory power: this suggests that we have not identified all the channels through which diversity affects satisfaction with the neighbourhood.

[25] Factors are obtained grouping single variables with Principal Component Analysis techniques.
[26] Table B13 in the Appendix reports results obtained including all variables. In both cases, as there is no year for which all questions are asked, information is pooled for the two closest years in which information is available.

10. Conclusion

Our estimates suggest that people do care about the characteristics of their neighbours. While people may care about the nature of their neighbours, they cannot control who they are. My presence in an area may have some externalities on my neighbours, and my decision to move is not something they can control. This combination of caring about something but being unable to control it is the classic recipe for stress so it is not surprising that changing communities stir up strong emotions and reactions. Understanding these is critical to making communities thrive.

This paper has investigated how diversity affects various measures of satisfaction with neighbourhood, seeking more causal estimates of the impacts than is found in most of the existing literature. Our main conclusions are that there is evidence of some effect of diversity on both overall satisfaction with the neighbourhood and specific aspects like fear of crime and, less clearly, the quality of social life. However, we do not find any significant association with the most commonly used measures of social capital such as generalized trust and membership of organizations. Although our results are suggestive, they are not definitive. The results are not always as robust as one would like and there is undoubtedly considerable room for further research about what determines the level of neighbourhood satisfaction and how that can be mediated, a topic on which this paper remains silent.

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Tables

Table 1. Descriptive statistics for values and attitude variables in the British Household Panel and in Understanding Society.

Variable	Mean	Standard Deviation	N
Satisfaction:			
Like your present neighbourhood	.926	.262	244,276
Plan to stay in your neighbourhood	.690	.463	102,012
Actual mobility	.067	.250	428,516
Social capital:			
Generally speaking, most people can be trusted	.368	.482	102,584
Active in at least one organisation	.585	.493	164,493
Member of at least one organisation	.530	.499	164,716
Willing to improve your neighbourhood	.760	.427	102,115
Crime:			
Worry you're being victim of crime	.478	.500	76,264
Feel unsafe walking alone at night	.182	.386	76,229
Likely home broken into	.236	.425	33,480
Likely car stolen/broken into	.078	.269	33,482
Likely drunks/tramps on the street	.149	.356	34,082
Likely graffiti on the walls	.232	.422	34,152
Likely people being attacked on the street	.084	.278	34,302
Likely racial insults/attacks	.056	.230	33,405
Likely teenagers hanging about	.568	.495	34,114
Likely vandalism	.263	.440	34,130
Quality of local services:			
Good schools	.699	.459	61,387
Good medical services	.706	.456	73,782
Good transportation	.500	.500	70,804
Good shopping facilities	.577	.494	75,323
Good leisure facilities	.441	.497	71,382
Suitable for children	.656	.475	32,953
Social life:			
Meet your neighbours often	.773	.419	147,400
Friends in the local neighbourhood	.613	.487	102,377
Can obtain advice locally	.553	.496	102,176
Can you borrow from people in the neighbourhood	.440	.496	102,039
Feel similar to people in the neighbourhood	.605	.489	102,149
Talk to people in your neighbourhood	.694	.460	102,441
Satisfied with social life	.656	.475	141,769

Notes: All variables are dummies constructed upon affirmative replies to the corresponding questions. Table B1 reports the waves where each variable appears.

Table 2. Descriptive statistics for individual-level control variables for the British Household Panel and Understanding Society sample.

Variable	Mean	Standard Deviation	Min	Max
Age	46.42	18.46	14	104
Female	0.539	0.498	0	1
Unemployed	0.045	0.208	0	1
Retired	0.215	0.411	0	1
Full-time student	0.007	0.085	0	1
Other non working	0.049	0.216	0	1
Married	0.532	0.499	0	1
Number of children	0.511	0.929	0	10
Non-white	0.097	0.297	0	1
Higher education	0.279	0.449	0	1
Low education	0.291	0.454	0	1
No education	0.132	0.339	0	1
Social house tenant	0.180	0.384	0	1
Private tenant	0.099	0.299	0	1

Notes: Excluded dummies for each set – working, high school education, and home owners, for labour force status, education and house status, respectively – are not reported.

Table 3. Descriptive statistics for main area-level variables.

Variable	Mean	Standard Deviation	Min	Max
Britain overall				
White share	0.918	0.143	0.007	1
Ethnic mix	0.128	0.181	0	0.870
Immigrant mix	0.132	0.135	0	0.681
Black share	0.020	0.051	0	0.637
Immigrant share	0.080	0.102	0	0.939
Asian share	0.048	0.101	0	0.997
Muslim share	0.029	0.075	0	0.953
Unemployment rate	0.039	0.035	0	0.986
Area (Ha)	568	2,740	0.73	115,963
Country of birth mix in 1971 (area level)	0.057	0.073	0	0.629
Age below 16 in 1991	0.200	0.035	0.053	0.406
Age above 65 in 1991	0.10	0.049	0.014	0.593
House owners in 1991	0.642	0.197	0.012	0.987
Social housing in 1991	0.229	0.162	0	0.938
Urban areas in 1991	0.111	0.314	0	1
BHPS and US sample				
White share	0.896	0.179	0.004	1
Ethnic mix	0.152	0.207	0	0.872
Immigrant mix	0.152	0.148	0	0.683
Black share	0.023	0.057	0	0.617
Immigrant share	0.094	0.118	0	0.757
Asian share	0.059	0.128	0	0.962
Muslim share	0.026	0.086	0	0.952
Unemployment rate	0.037	0.029	0	0.708
Area (Ha)	599	2,152	1.24	77,870
Country of birth mix in 1971 (area level)	0.055	0.073	0	0.629
Age below 16 in 1991	0.201	0.036	0.053	0.372
Age above 65 in 1991	0.162	0.049	0.014	0.593
House owners in 1991	0.657	0.188	0.012	0.987
Social housing in 1991	0.224	0.160	0	0.987
Urban areas in 1991	0.106	0.308	0	1

Notes: Area-level information refers to the Lower Super Output Area codification related to the 2001 census. *Britain overall* panel displays descriptives for all English, Welsh, and Scottish LSOAs in the non-ipolated years only. *BHPS and US sample* panel displays results for the subset of LSOAs that appears in the British Household Panel and in Understanding Society. Se Appendix A for a description of the variables. *Muslim share* is proxied by the share of Pakistani and Bangladeshi people in the area.

Table 4: Correlations.

	Ethnic mix index	Migrant mix index	White share	Black share	Immigrant share	Asian share	Muslim share
Ethnic mix index	1						
Immigrant mix index	0.853*	1					
White share	-0.958*	-0.809*	1				
Black share	0.771*	0.653*	-0.727*	1			
Immigrant share	0.847*	0.977*	-0.839*	0.658*	1		
Asian share	0.800*	0.641*	-0.900*	0.382*	0.683*	1	
Muslim share	0.728*	0.597*	-0.832*	0.420*	0.633*	0.870*	1

Notes: * $p < 0.01$. Correlations are estimated for the universe of the 40,880 UK LSOAs, for the years for which census data are available, namely 1991, 2001, and 2011. Se Appendix A for a description of the variables.

Table 5: The impact of ethnic mix on how you like your neighbourhood.

	No sample selection					Sample selection				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual* Area FE	(10) Individual+ Area FE
	A. OLS									
White share	0.123***	0.224***	0.112**	0.204***	0.206***	0.122***	0.241***	0.116**	0.274***	0.282***
	(0.017)	(0.034)	(0.051)	(0.053)	(0.053)	(0.020)	(0.041)	(0.056)	(0.055)	(0.055)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
	B. IV									
White share	0.084***	0.225***	0.105	0.356***	0.346***	0.086***	0.220***	0.131*	0.327***	0.337***
	(0.023)	(0.048)	(0.076)	(0.082)	(0.082)	(0.022)	(0.049)	(0.074)	(0.081)	(0.076)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP	1.3e+04	3526.216	424.199	996.240	1016.209	780.445	179.746	2.403	4.640	4.391

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. *OLS* is the baseline specification not including any individual or area Fixed Effects. Standard errors account for clusters at the individual level in OLS, *Individual FE*, and *Area+Individual FE* specifications. Standard errors account for clusters at the area level for *Area FE*, and for clusters ate the area-individual level in the *Area*Individual FE* specifications. *Area FE* specifications include Lower Super Output area Fixed Effects, *Area*Individual FE* include LSOA-individual level fixed effects, and *Area+Individual FE* include both LSOA and individual fixed effects, taken as separate FE sets. Panel B shows Instrumental Variable estimates. Right-hand panels include controls for sample selection, as illustrated by equation (13), with α equal to 1. IV-Sample Selection specifications use instrumental variables for both the share of white people and for the corresponding sample selection variable. Sample selection coefficients are reported in Table B3 of the Appendix. All regressions include individual, area-level controls, and year dummy variables. Se Appendix A for a description of the control variables and of the variables of interest. KP is the Kleibergen-Paap weak instrument statistic.

Table 6: The impact of ethnic mix on how you like your neighbourhood. ***First difference results.***

	No Sample Selection				Sample Selection			
	(1) FD	(2) FD fixed	(3) Full FD decomposition	(4) FD within area*individual	(5) FD	(6) FD fixed	(7) Full FD decomposition	(8) FD within area*individual
				A. OLS				
White share (difference)	0.419***	-0.121	0.184***	0.465***	0.446***	-0.132	0.172*	0.462***
	(0.046)	(0.094)	(0.092)	(0.092)	(0.051)	(0.098)	(0.095)	(0.096)
White share: between areas difference			0.394***				0.436***	
			(0.047)				(0.057)	
N	170,042	170,057	170,042	155,788	170,042	170,057	170,042	155,778
				B. IV				
White share (difference)	0.412***	-0.247	0.463***	1.141 ***	0.439***	-0.236	0.462***	1.118***
	(0.055)	(0.167)	(0.161)	(0.181)	(0.062)	(0.086)	(0.159)	(0.192)
White share: between areas difference			0.371***				0.398***	
			(0.056)				(0.062)	
N	168,572	168,631	168,572	154,528	168,572	168,631	168,572	154,528
KP	3758.990	1889.531	926.808	1635.509	134.215	8.422	4.015	7.549

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Robust standard errors clustered at the individual level in parentheses. In each regression the dependent variable is a dummy that takes value 1 if the respondent states to like the neighbourhood in which he/she lives. See Appendix A for a description of the control variables and of the variables of interest. See Section 4 for a discussion of the various First Difference Specifications, Instrumental Variables, and controls for sample selection. KP is the Kleibergen-Paap weak instrument statistic.

Table 7: Heterogeneity of results. **Dependent variable:** 1 if affirmative answer to *Do you like your neighbourhood?*

	OLS		***IV***	
	(1) No FE	(2) Individual FE	(3) No FE	(4) Individual FE
White share	0.191***	0.179***	0.135***	0.199***
	(0.024)	(0.048)	(0.026)	(0.057)
White share *NonWhite	-0.080***	0.056	-0.060***	0.255***
	(0.015)	(0.058)	(0.017)	(0.071)
White share *Higher Education	-0.095***	-0.188***	-0.123***	-0.293***
	(0.015)	(0.045)	(0.016)	(0.052)
White share*Low Education	-0.056***	0.092	-0.049***	-0.094
	(0.016)	(0.061)	(0.017)	(0.080)
White share*No Education	-0.062***	0.047	-0.041*	0.145*
	(0.021)	(0.065)	(0.022)	(0.082)
White share *Age50	-0.011	0.018	-0.012	-0.011
	(0.0114)	(0.029)	(0.015)	(0.032)
White share *Home Owner	0.014	0.069**	0.024	0.087***
	(0.017)	(0.033)	(0.018)	(0.035)
White share*Social Tenant	-0.013	0.045	-0.013	0.015
	(0.021)	(0.049)	(0.022)	(0.052)
N	228,636	199,353	228,636	199,353

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses, clustered at the individual level. Please refer to Notes of Table 5 for references about different specifications, and to Appendix A for full control variables description.

Table 8: Actual moving and propensity to stay in the area. Linear probability models.

A	(1) No FE	(2) Individual FE	(3) Area FE	(4) FD (lagged)
	Dependent variable: Actual moving			
Like your neighbourhood (lagged)	-0.084*** (0.003)	-0.110*** (0.005)	-0.089*** (0.005)	-0.037*** (0.004)
N	198,431	174,328	193,914	145,757
B	(1) No FE	(2) Individual FE		(3) Area FE
	Dependent variable: Propensity to stay			
Like your neighbourhood	0.487*** (0.007)	0.357*** (0.014)		0.405*** (0.010)
N	61,316	33,129		56,654

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. *Actual moving* is a dummy that takes value 1 if the respondent is observed in 2 different LSOAs from one year to the other. *Propensity to stay* is a dummy variable that takes value 1 if the respondent states that he/she is willing to stay in the area. See Notes of Table 5.

Table 9: Trust and activity in organisations.

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
	Dependent variable: *Generalised trust*									
White share	0.016	0.018	-0.078	-0.039	-0.069	-0.063*	0.134*	0.097	0.144	0.120
	(0.024)	(0.052)	(0.112)	(0.122)	(0.128)	(0.032)	(0.075)	(0.189)	(0.210)	(0.220)
N	90,799	64,394	86,672	58,849	62,961	90,799	64,394	86,672	58,849	62,961
KP						1.1e+04	1536.050	451.487	1057.199	961.337
	Dependent variable: *Active in any organisation*									
White share	-0.023	-0.045	-0.065	-0.054	-0.053	-0.036	-0.015	0.095	0.133	0.106
	(0.021)	(0.044)	(0.068)	(0.078)	(0.079)	(0.028)	(0.062)	(0.105)	(0.133)	(0.134)
N	148,651	120,258	144,562	111,814	118,342	148,651	120,258	144,562	111,814	118,342
KP						1.9e+04	3640.095	442.256	917.578	906.409

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See notes of Table 5.

Table 10: Fear of Crime. **Dependent variable:** 1 if affirmative answer to *Are you worried of being victim of a crime?*

	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			OLS		
White share	-0.120***	-0.104	-0.390***	-0.324**	-0.321**
	(0.024)	(0.076)	(0.114)	(0.136)	(0.147)
N	65,162	34,799	60,501	28,070	32,778
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			IV		
White share	-0.139***	-0.228**	-1.029***	-1.404***	-1.374***
	(0.032)	(0.112)	(0.191)	(0.236)	(0.255)
N	65,162	34,799	60,501	28,070	32,778
KP	1.3e+04	1541.112	697.085	1126.676	964.205

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See notes of Table 5.

Table 11: Quality of services in the area. **Dependent variable:** Quality of services in the area index

	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			OLS		
White share	-0.159	0.023	-0.149	-0.836*	-0.841
	(0.126)	(0.278)	(0.477)	(0.468)	(0.521)
N	21,942	15,012	20,253	11,738	13,307
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			IV		
White share	-0.269*	0.208	-0.526	-0.602	-0.663
	(0.159)	(0.426)	(0.692)	(0.697)	(0.776)
N	21,942	15,012	20,253	11,738	13,307
KP	4049.557	742.314	294.616	673.939	541.340

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See notes of Table 5.

Table 12: Quality of social life. **Dependent variable:** Quality of social life index

	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			OLS		
White share	0.351***	0.300	0.403	0.802***	0.791**
	(0.108)	(0.212)	(0.388)	(0.328)	(0.361)
N	31,157	24,538	29,643	18,770	22,430
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE
			IV		
White share	0.401***	0.294	0.424	0.830*	0.835
	(0.140)	(0.300)	(0.561)	(0.495)	(0.545)
N	31,157	24,538	29,643	18,770	22,430
KP	3782.681	1265.654	438.880	1210.790	996.177

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See notes of Table 5.

Table 13. Satisfaction production function. **Dependent variable:** 1 if affirmative answer to Do you like your neighbourhood?

	No FE		**Individual FE**		**Area FE**	
	(1)	(2)	(3)	(4)	(5)	(6)
White share		0.109***		0.327***		0.056
		(0.023)		(0.105)		(0.121)
Social capital	0.007***	0.007***	0.003	0.003	0.003**	0.003*
	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Crime	-0.034***	-0.033***	-0.026***	-0.026***	-0.023***	-0.023***
	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Quality of local services	0.013***	0.014***	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Social life	0.024***	0.024***	0.020***	0.019***	0.021***	0.021***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	20,143	20,118	13,273	13,256	18,359	18,331

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Bootstrapped standard errors (200 replications) in parentheses. The full set of variables is not available for all years. The sample is therefore pooled to aggregate information for closest subsequent years for which information is available. See Appendix A for a description of the main variables and Table B2 in the Appendix for a description of the Principal Component Analysis used to construct the variables *Social Capital*, *Crime*, *Quality of local services*, and *Social life*.

Appendix

A –Variables description

All area level variables refer to the Lower Super Output Areas (LSOA) level. Data for inter census years have been derived from LSOA level linear ipolation.

Other diversity variables

- ***Ethnic mix*** index of ethnic fractionalisation calculated following Alesina and La Ferrara (2000)

$$Ethnic\ Mix = 1 - \sum_i s_{ia}^2$$

  where s_{ia} is the share of people in each ethnic group i in the population area a. The ethnic group considered are White, Indian, Pakistani, Bangladeshi, Chinese, Other Asian, Black Carribean, Black African, Other Black, and Other Ethnic groups. Source: C*ensus of population* 1991-2011.
- ***Migrant mix*** index of country of birth fractionalisation calculated in the same way as the Ethnic mix, over the share of people born in UK, Europe, Africa, India, Pakistan, and other countries. Source: *Census of population* 1991-2011.
- ***Immigrant share*** people born outside UK over the total population. Source: *Census of population* 1991-2011.
- ***White share***, ***Asian share***, ***Black share***, and ***Muslim share*** (we proxy the Muslim share with the share of Pakistani and Bangladeshi people in the area as religion is not available for all censuses considered). Source: *Census of population* 1991-2011.

Control variables

All regressions control for the following individual level characteristics from BHPS and Understanding Society

Individual level characteristics

- Age
- Gender dummy
- Level of education (Dummy variables: Higher Education – Primary – No education. Excluded category: Secondary education)
- Working status (Dummy variables: Unemployed - Retired – Full time student – Out of the labour force for other reasons, Excluded category: Working)
- Ethnicity (Dummy: Non-white vs White)
- Marital status (Dummy: Married vs Not married)

- Number of children
- House ownership status (Dummy variables: Private tenant, Social house tenant. Excluded category: Home owner)

Time invariant LSOA level characteristics. Source: *Census of population*

- Government Office Regions dummies
- 1971 migrant mix
- 1991 share of people employed in each 1-digit SIC industry
- 1991 age structure – percentage of people aged less than 16 and more than 65
- 1991 proportions of house owners and of households living in council houses
- Dummy for urban areas in 1991
- Logarithm of the size of the LSOA (hectares)

Time-variant LSOA level characteristics

- ***Rate of unemployment*** - average monthly number of people claiming for unemployment related benefits as a share of the working age population. Source: *Business Register and Employment Survey* (BRES) 1991-2014.
- ***Index of Multiple Deprivation*** – it combines information on different domains – income, employment, education, skills and training, health and disability, barriers to housing and services, living environment – at the Lower-layer Super Output Area. Source: Department for Communities and Local Government for England, Welsh Government National Statistics for Wales, and Scottish Government National Statistics for Scotland

B – Additional Tables

Table B1: Values and attitude questions in the British Household Panel (B) and in Understanding Society (U).

Variable	Waves
Satisfaction:	
Like your present neighbourhood	B: all - U: 3
Plan to stay in your neighbourhood	B: 8, 13, 18 - U: 3
Social capital:	
Generally speaking, most people can be trusted	B: 8, 10, 13, 15, 17 - U: 1
Active in at least one organisation	B: 1-5, 7, 9, 11, 13, 15, 17 – U: 3
Member of at least one organisation	B: 1-5, 7, 9, 11, 13, 15, 17 – U: 3
Willing to improve your neighbourhood	B: 8, 13, 18 - U: 3
Crime:	
Worry you're being victim of crime	B: 7, 12, 17 - U: 3
Feel unsafe walking alone at night	B: 7, 12, 17 - U: 3
Likely home broken into	B: 7, 12, 17
Likely car stolen/broken into	B: 7, 12, 17
Likely drunks/tramps on the street	B: 7, 12, 17
Likely graffiti on the walls	B: 7, 12, 17
Likely people being attacked on the street	B: 7, 12, 17
Likely racial insults/attacks	B: 7, 12, 17
Likely teenagers hanging about	B: 7, 12, 17
Likely vandalism	B: 7, 12, 17
Quality of local services:	
Good schools	B: 8, 13, 18 - U: 3
Good medical services	B: 8, 13, 18 - U: 3
Good transportation	B: 8, 13, 18 - U: 3
Good shopping facilities	B: 8, 13, 18 - U: 3
Good leisure facilities	B: 8, 13, 18 - U: 3
Suitable for children	B: 8, 13, 18
Social life:	
Meet your neighbours often	B: 8, 13, 18 - U: 3
Friends in the local neighbourhood	B: 8, 13, 18 - U: 3
Can obtain advice locally	B: 8, 13, 18 - U: 3
Can you borrow from people in the neighbourhood	B: 8, 13, 18 - U: 3
Feel similar to people in the neighbourhood	B: 8, 13, 18 - U: 3
Talk to people in your neighbourhood	B: 8, 13, 18 - U: 3
Satisfied with social life	B: 6-10, 12-18

Table B2. Correlations between indices and Principal Component Analysis.

Panel A. Correlation matrix

	Social capital	Crime	Quality of local services	Social life
Social capital	1			
Crime	-0.108*	1		
Quality of local services	0.116*	-0.184*	1	
Social life and neighbourhood	0.151*	-0.072*	0.206*	1

Notes: * $p < 0.01$.

Panel B. Principal Components Analysis - Eigenvalues

	Social capital	Crime	Quality of local services	Social life and Neighbourhood
1st Component	1.682	3.443	2.033	2.685
2nd Component	1.002	1.073	1.211	0.988
3rd Component	0.914	0.969	0.887	0.864
4th Component	0.402	0.838	0.702	0.813
5th Component	-	0.765	0.595	0.634
6th Component	-	0.667	0.572	0.549
7th Component	-	0.641	-	0.467
8th Component	-	0.570	-	-
9th Component	-	0.563	-	-
10th Component	-	0.472	-	-

Panel C. Principal Components Analysis – 1st Principal Components

Social Capital		**Crime**	
Generally speaking, most people can be trusted	.276	Worry you're being victim of crime	.154
Active in at least one organisation	.658	Feel unsafe walking alone at night	.224
Member of at least one organisation	.666	Likely home broken into	.351
Willing to improve your neighbourhood	.219	Likely car stolen/broken into	.331
		Likely drunks/tramps on the street	.331
		Likely graffiti on the walls	.345
		Likely people being attacked on the street	.351
		Likely racial insults/attacks	.309
		Likely teenagers hanging about	.292
		Likely vandalism	.402
Quality of local services		**Social life and Neighbourhood**	Crime
Good schools	.412	Meet your neighbours often	.341
Good medical services	.450	Friends in the local neighbourhood	.465
Good transportation	.356	Can obtain advice locally	.441
Good shopping facilities	.427	Can you borrow from people in the neighbourhood	.354
Good leisure facilities	.433	Feel similar to people in the neighbourhood	.369
Suitable for children	.362	Talk to people in your neighbourhood	.446
		Satisfied with social life	.113

Notes: There is no year in which all questions have been asked, therefore, for this table, information is kept only for adjacent waves that maximize the number of variables observed, namely for waves 7 and 8, 12 and 13, and 17 and 18 of the BHPS.

Table B3. Main results, first stage regressions. **Dependent variable:** 1 if affirmative answer to *Do you like your neighbourhood?*

Panel A: No sample selection

Dependent variables	Specification	White share
White share	No FE	0.981*** (.009)
	Individual FE	0.899*** (.015)
	Area FE	1.226*** (.060)
	Area*Individual FE	1.225*** (.039)
	Area+Individual FE	1.218*** (.038)

Panel B: Sample selection

		Instrumental Variable First Stage Coefficients	
Dependent variable		**White share**	**Sample selection: White share**
White share	No FE	1.067*** (.008)	-0.282*** (.014)
	Individual FE	1.007*** (.017)	-0.289*** (.030)
	Area FE	1.408*** (.059)	-1.255*** (.164)
	Area*Individual FE	1.412*** (.040)	-1.386*** (.099)
	Area+Individual FE	1.411*** (.039)	-1.387*** (.099)
Sample selection: White share	No FE	0.013 (.008)	0.573*** (.018)
	Individual FE	-0.023 (.018)	0.558*** (.037)
	Area FE	0.021 (.041)	0.266** (.234)
	Area*Individual FE	0.001 (.028)	0.250*** (.081)
	Area+Individual FE	-0.001 (.028)	0.236*** (.079)

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Table B3 for notes on control variables, variables of interest, and clusters.

Table B4. Main results, levels. Coefficients of sample selection control variables.
Dependent variable: 1 if affirmative answer to *Do you like your neighbourhood?*

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(7) No FE	(8) Individual FE	(9) Area FE	(10) Individual*Area FE	(11) Individual+ Area FE
Sample selection:										
White share	-0.083**	-0.154**	-0.064	-0.246***	-0.272***	-0.028	-0.237	0.117	1.657	1.068
	(0.037)	(0.063)	(0.084)	(0.087)	(0.087)	(0.108)	(0.151)	(1.154)	(1.615)	(1.504)
N	225,688	200,497	221,471	192,451	198,839	225,688	200,497	221,471	192,451	198,839

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. See Notes for Table 5.

Table B5. The impact on the ethnic mix fractionalisation index on how you like your neighbourhood

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(7) No FE	(8) Individual FE	(9) Area FE	(10) Individual* Area FE	(11) Individual+ Area FE
	No sample selection									
Fractionalisation	-0.020***	-0.025***	-0.016**	-0.026***	-0.026***	-0.013***	-0.027***	-0.020	-0.056***	-0.054***
	(0.003)	(0.004)	(0.007)	(0.007)	(0.007)	(0.003)	(0.007)	(0.044)	(0.045)	(0.013)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP						1.7e+04	6319.330	455.241	1116.179	1150.846

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B6. The impact of diversity on how you like your neighbourhood. Black share control variable

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual* Area FE	(10) Individual+ Area FE
	No sample selection									
White share	0.093***	0.118***	0.011	0.082	0.068	0.092***	0.156**	0.242	0.512*	0.400
	(0.019)	(0.043)	(0.068)	(0.070)	(0.709)	(0.026)	(0.061)	(0.244)	(0.263)	(0.253)
Black share	-0.171***	-0.480***	-0.548**	-0.641**	-0.764***	0.048	-0.231	0.776	0.827	0.298
	(0.052)	(0.120)	(0.254)	(0.279)	(0.274)	(0.062)	(0.155)	(1.258)	(1.292)	(1.236)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP						2753.834	1335.770	5.642	9.750	10.609

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B7. The impact of diversity on how you like your neighbourhood. Asian share control variable

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(7) No FE	(8) Individual FE	(9) Area FE	(10) Individual* Area FE	(11) Individual+ Area FE
	No sample selection									
White share	0.179***	0.349***	0.312***	0.443***	0.483***	-0.025	0.178*	0.079	0.217	0.321
	(0.033)	(0.064)	(0.102)	(0.109)	(0.108)	(0.044)	(0.099)	(0.309)	(0.342)	(0.337)
Asian share	0.077*	0.205**	0.339**	0.407**	0.472***	-0.149***	-0.045	-0.036	-0.253	-0.041
	(0.041)	(0.091)	(0.157)	(0.167)	(0.167)	(0.055)	(0.161)	(0.534)	(0.603)	(0.593)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP						1578.601	752.657	21.847	45.827	47.403

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B8. The impact of diversity on how you like your neighbourhood. Muslim share control variable

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE	(7) No FE	(8) Individual FE	(9) Area FE	(10) Individual*Area FE	(11) Individual+Area FE
	No sample selection									
White share	0.150***	0.234***	0.174***	0.286***	0.301***	0.087***	0.157***	0.064	0.268**	0.315**
	(0.021)	(0.040)	(0.064)	(0.063)	(0.062)	(0.027)	(0.058)	(0.123)	(0.135)	(0.133)
Muslim share	0.068*	0.056	0.207	0.283*	0.330**	0.012	-0.153	-0.132	-0.357	-0.116
	(0.036)	(0.083)	(0.163)	(0.163)	(0.162)	(0.045)	(0.128)	(0.407)	(0.537)	(0.526)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP						3523.271	502.735	12.745	24.081	25.214

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B9. The impact of diversity on how you like your neighbourhood. Immigrant share control variable

	OLS					IV				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual*Area FE	(5) Individual+Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual*Area FE	(10) Individual+Area FE
	No sample selection									
White share	0.215***	0.295***	0.133**	0.075	0.101	0.278***	0.458***	0.354	2.174	1.273
	(0.025)	(0.048)	(0.066)	(0.069)	(0.069)	(0.035)	(0.083)	(0.834)	(1.679)	(1.535)
Foreigners share	0.189***	0.150**	0.030	-0.181**	-0.146*	0.385***	0.450***	0.219	1.546	0.787
	(0.035)	(0.058)	(0.073)	(0.081)	(0.080)	(0.054)	(0.105)	(0.713)	(1.419)	(1.295)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP						4161.402	749.246	4.995	4.941	5.258

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B10. The impact of diversity on how you like your neighbourhood. Travel to Work Area Fixed effects.

	No sample selection			Sample selection		
	(1)	(2)	(3)	(4)	(5)	(6)
	TTWA FE	Individual* TTWA FE	Individual+TTWA FE	TTWA FE	Individual*TTWA FE	Individual+TTWA FE
	A. OLS					
White share	0.108**	0.235***	0.202***	0.110***	0.281***	0.223***
	(0.026)	(0.058)	(0.034)	(0.021)	(0.046)	(0.042)
N	224,361	197,712	199,311	224,361	197,712	199,311
	B. IV					
White share	0.065***	0.283***	0.203***	0.060***	0.289***	0.201***
	(0.024)	(0.055)	(0.049)	(0.015)	(0.060)	(0.051)
N	224,361	197,712	199,311	224,361	197,712	199,311
KP	563.763	2257.511	3310.845	33.635	85.984	155.886

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses.

Table B11. The impact of diversity on how you like your neighbourhood. Controls for Travel to Work Area variables and fixed effects

	No sample selection					Sample selection				
	(1) No FE	(2) Individual FE	(3) TTWA FE	(4) Individual* TTWA FE	(5) Individual+ TTWA FE	(6) No FE	(7) Individual FE	(8) TTWA FE	(9) Individual* TTWA FE	(10) Individual+ TTWA FE
				A. OLS						
White share	0.102***	0.204***	0.120**	0.231***	0.208***	0.097***	0.227***	0.119***	0.297***	0.254***
	(0.018)	(0.038)	(0.029)	(0.042)	(0.038)	(0.023)	(0.050)	(0.028)	(0.059)	(0.051)
White share TTWA level	0.030	0.032	-0.162***	0.013	-0.044	0.034	0.014	-0.161**	-0.049	-0.078
	(0.025)	(0.050)	(0.063)	(0.064)	(0.061)	(0.027)	(0.056)	(0.066)	(0.074)	(0.070)
N	224,362	199,312	224,361	197,712	199,311	224,362	199,312	224,361	197,712	199,311
				B. IV						
White share	0.051**	0.187***	0.072***	0.275***	0.184*	0.052**	0.179***	0.071***	0.282***	0.200***
	(0.025)	(0.054)	(0.027)	(0.064)	(0.151)	(0.025)	(0.059)	(0.019)	(0.075)	(0.060)
White share TTWA level	0.059**	0.067	-0.139**	0.026	0.081	0.059**	0.074	-0.138**	0.019	-0.007
	(0.027)	(0.059)	(0.062)	(0.087)	(0.140)	(0.029)	(0.064)	(0.056)	(0.094)	(0.084)
N	224,362	199,312	224,361	197,712	199,311	224,362	199,312	224,361	197,712	199,311
KP	5612.847	1498.096	290.875	912.301	165.694	474.356	109.597	22.446	54.126	99.753

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses.

Table B12. The impact of diversity on how you like your neighbourhood. Census years only

	No sample selection					Sample selection				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual*Area FE	(10) Individual+Area FE
				A. OLS						
White share	0.083***	0.141***	0.074	0.119*	0.105	0.079***	0.115*	0.031	0.120	0.111
	(0.014)	(0.054)	(0.067)	(0.072)	(0.080)	(0.017)	(0.060)	(0.071)	(0.076)	(0.084)
N	54,791	21,045	50,029	13,525	18,327	54,791	21,045	50,029	13,525	18,327
				B. IV						
White share	0.035*	0.199***	-0.023	0.102	0.082	0.040**	0.172***	0.039	0.073	0.073
	(0.019)	(0.082)	(0.090)	(0.109)	(0.120)	(0.010)	(0.079)	(0.101)	(0.102)	(0.111)
N	54,791	21,045	50,029	13,525	18,327	54,791	21,045	50,029	13,525	18,327
KP	1.5e+04	1201.846	369.928	605.281	502.618	464.350	46.277	3.514	4.989	4.502

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Appendix A and notes of Table 5 for notes on control variables, variables of interest, and clusters.

Table B13. Satisfaction production function.
Dependent variable: 1 if affirmative answer to Do you like your neighbourhood?

	No Fixed Effects		**Individual FE**		**Area FE**	
	(1)	(2)	(3)	(4)	(5)	(6)
White share		0.064**		0.304***		0.060
		(0.025)		(0.101)		(0.119)
Social capital						
General trust	0.009***	0.009***	0.003	0.003	0.007**	0.008**
	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)
Active in any organisation	-0.001	-0.001	0.004	0.003	0.002	0.002
	(0.004)	(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
Member of any organisation	0.008**	0.008**	0.001	0.002	0.001	0.001
	(0.004)	(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
Willing to improve your neighbourhood	0.011**	0.011**	0.007	0.007	0.006	0.006
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
Crime						
Worry being victim of a crime	0.001	0.001	-0.003	-0.003	-0.004	-0.004
	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)
Worry alone at night	-0.039***	-0.038***	-0.037***	-0.037***	-0.041***	-0.041***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
Likely home broken into	-0.017***	-0.017***	-0.010	-0.011	-0.013**	-0.013**
	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.006)
Likely car stolen	-0.070***	-0.070***	-0.050***	-0.052***	-0.053***	-0.053***
	(0.011)	(0.011)	(0.015)	(0.015)	(0.012)	(0.012)
Likely drunk/trumps	-0.021***	-0.020***	-0.037***	-0.035***	-0.016*	-0.016*
	(0.007)	(0.007)	(0.011)	(0.011)	(0.009)	(0.009)
Likely graffiti	-0.011**	-0.010*	-0.018**	-0.018**	-0.007	-0.007
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
Likely people being assaulted	-0.039***	-0.037***	-0.015	-0.013	-0.029**	-0.028**
	(0.011)	(0.011)	(0.017)	(0.017)	(0.012)	(0.012)
Likely racial insults	-0.052***	-0.050***	-0.034*	-0.032	-0.021	-0.021
	(0.013)	(0.013)	(0.020)	(0.020)	(0.015)	(0.015)
Likely teens hanging about	-0.004	-0.005	-0.007	-0.008	-0.000	0.000
	(0.003)	(0.003)	(0.006)	(0.006)	(0.004)	(0.004)
Likely vandalism	-0.025***	-0.027***	-0.022***	-0.022***	-0.019***	-0.019***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)

Table B13 (cont'ed). Satisfaction production function.
Dependent variable: 1 if affirmative answer to Do you like your neighbourhood?

	No Fixed Effects		Individual FE		Area FE	
	(1)	(2)	(3)	(4)	(5)	(6)
Quality of local services						
Good schools	0.001	0.000	0.001	0.001	-0.002	-0.002
	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.005)
Good medical services	0.001	0.001	0.003	0.003	0.004	0.004
	(0.004)	(0.004)	(0.006)	(0.006)	(0.004)	(0.004)
Good transports	0.000	0.001	-0.001	0.001	-0.003	-0.003
	(0.003)	(0.003)	(0.005)	(0.006)	(0.004)	(0.004)
Good shopping facilities	0.001	0.002	-0.002	-0.002	0.004	0.004
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
Good leisure facilities	-0.001	-0.000	0.005	0.005	0.000	0.001
	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)
Good children facilities	0.076***	0.075***	0.042***	0.041***	0.043***	0.043***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.006)
Social life						
Meet Neigh. Often	-0.002	-0.003	0.015*	0.014*	0.005	0.005
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
Have friends in the neighb.	0.032***	0.032***	0.023***	0.024***	0.029***	0.029***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.005)	(0.005)
Can have advice in the neighb.	0.011***	0.011**	0.007	0.006	0.011**	0.010**
	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.005)
Can borrow from neighbours	-0.005	-0.005	0.007	0.007	0.001	0.001
	(0.003)	(0.003)	(0.006)	(0.006)	(0.004)	(0.004)
Feel similar to neighbourhood	0.044***	0.043***	0.034***	0.033***	0.036***	0.036***
	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.005)
Talk to neighbours	0.020***	0.020***	0.012	0.011	0.018***	0.019***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
Satisfied with social life	0.031***	0.031***	0.004	0.003	0.020***	0.020***
	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.005)
Observations	20,143	20,118	13,273	13,256	18,393	18,365

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Table B3 for notes on control variables, variables of interest, and clusters.

C – Endogenous deprivation

A large amount of discussion in the UK context has been focusing on how deprivation affects various aspects of social life and in particular social cohesion (Laurence and Heath, 2008; Letki, 2008; Andrews, 2009; Fieldhouse and Cutts, 2010; Twigg et al, 2010; Laurence, 2011; Becares et al, 2011; Sturgis et al, 2011; Demireva and Heath, 2014). One concern may be that deprivation can partly capture the effect that we attribute to diversity, and that our estimates could actually be partly biased. Our approach throughout the paper is to control for two measures of deprivation, the unemployment rate (source: Nomis) and the Index of Multiple Deprivation (source: ONS).

Because of the interest these variables have attracted Table C1 shows the coefficients on the unemployment rate for the regressions reported in Table 5. In specifications without fixed effects or only individual fixed effects there is a significant negative effect of unemployment on neighbourhood satisfaction. But it is not as robust as the estimated effect of the white share.

One might be concerned about the exogeneity of the unemployment rate so we try to go a bit further and to consider unemployment as an additional endogenous factor.

As we do for diversity, we pursue two approaches; one relies on instrumental variables and the other attempts at controlling for the location bias. For the latter we mimic what illustrated in Section 4, *Sample Selection* paragraph, and therefore we add as a control a weighted average of the unemployment rate (u) constructed as follows

$$\hat{u}_{1(\cdot n)t} \equiv \sum_{j \neq n} e^{-\alpha d_{nj}} \hat{u}_{jt}$$

where d_{nj} is the distance between the neighbourhoods and $\alpha$is a measure of the cost of distance – that we set equal to 1 for simplicity, although trying with different cost values does not change the results.

The instrumental variable that we use is, as for diversity, a Bartik style instrument (Bartik, 1991), which exploits the fact that, due to historical reasons, areas differ in the industrial mix of local employment. Being ϕ_{sn} the share working age people employed in sector s i in neighbourhood n in some base year, and $(logL_{st} - logL_{st-1})$ the change in log employment in the sector at time t, the change in demand given is then:

$$\Delta C_{nt} = \sum_s \phi_{sn}(logL_{st} - logL_{st-1})$$

This instrument is best targeted at capturing changes in the unemployment rate as it represents the change in the demand index. In other words it is well-suited when the model is estimated in first-differences. One could write the level of the of the demand as:

$$C_{nt} = C_{n0} + \sum_s \phi_{sn}(logL_{st} - logL_{st-1})$$

for some base-year measure of local demand, C_{n0}. If there are neighbourhood fixed effects then the initial level gets absorbed into that effect. If there are not then one needs to control for variables that measure the initial level of demand and we use the initial industry shares. The results when both the white share and unemployment are treated as endogenous are reported in Table C2. They are very similar to those reported in Table C1 though the IV results are considerably noisier.

Table C1: The impact of ethnic mix and unemployment on how you like your neighbourhood. White share as only endogenous variable

	No sample selection					Sample selection				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual* Area FE	(10) Individual+ Area FE
	A. OLS									
White share	0.123***	0.224***	0.112**	0.204***	0.206***	0.122***	0.241***	0.116**	0.274***	0.282***
	(0.017)	(0.034)	(0.051)	(0.053)	(0.053)	(0.020)	(0.041)	(0.056)	(0.055)	(0.055)
Unemployment rate	-0.104***	-0.109***	0.012	0.028	-0.006	-0.104***	-0.108***	0.012	0.029	-0.005
	(0.040)	(0.041)	(0.047)	(0.037)	(0.037)	(0.040)	(0.041)	(0.047)	(0.037)	(0.037)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
	B. IV									
White share	0.084***	0.225***	0.105	0.356***	0.346***	0.086***	0.220***	0.131*	0.327***	0.337***
	(0.023)	(0.048)	(0.076)	(0.082)	(0.082)	(0.022)	(0.049)	(0.074)	(0.081)	(0.076)
Unemployment rate	-0.108***	-0.109***	0.012	0.020	-0.012	-0.108***	-0.109***	0.025	-0.001	-0.018
	(0.040)	(0.041)	(0.047)	(0.037)	(0.037)	(0.040)	(0.041)	(0.053)	(0.044)	(0.044)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP	1.3e+04	3526.216	424.199	996.240	1016.209	780.445	179.746	2.403	4.640	4.391

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Notes of Table 5 and Appendix A for further details

Table C2: The impact of ethnic mix and unemployment on how you like your neighbourhood. White share and unemployment rate as endogenous variables.

	No sample selection					Sample selection				
	(1) No FE	(2) Individual FE	(3) Area FE	(4) Individual* Area FE	(5) Individual+ Area FE	(6) No FE	(7) Individual FE	(8) Area FE	(9) Individual* Area FE	(10) Individual+ Area FE
	A. OLS									
White share	0.123***	0.224***	0.112**	0.204***	0.206***	0.124***	0.239***	0.116**	0.273***	0.282***
	(0.017)	(0.034)	(0.051)	(0.053)	(0.053)	(0.020)	(0.041)	(0.056)	(0.055)	(0.055)
Unemployment rate	-0.104**	-0.109***	0.012	0.028	-0.006	-0.066	-0.150**	0.002	0.075	0.025
	(0.040)	(0.041)	(0.047)	(0.037)	(0.037)	(0.061)	(0.064)	(0.074)	(0.061)	(0.061)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
	B. IV									
White share	0.060*	0.182***	0.223	0.583***	0.523***	0.071	0.279***	0.119	0.448**	0.356**
	(0.035)	(0.060)	(0.149)	(0.156)	(0.152)	(0.063)	(0.084)	(0.170)	(0.183)	(0.178)
Unemployment rate	-1.681	-4.217	-1.008	-1.943*	-1.548	-1.747	-3.518	0.459	-0.589	0.305
	(1.680)	(2.969)	(1.091)	(1.099)	(1.071)	(1.997)	(3.783)	(1.632)	(1.627)	(1.589)
N	224,362	199,312	220,144	191,413	197,618	224,362	199,312	220,144	191,413	197,618
KP	13.908	4.269	4.995	17.316	17.873	7.109	1.814	1.961	6.366	6.088

Notes: * p < 0.1 ** p < 0.05 *** p < 0.001. Standard errors in parentheses. See Notes of Table 5 and Appendix A for further details

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