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Longhi, S. ORCID: https://orcid.org/0000-0003-4115-3321 (2014) Cultural diversity and subjective well-being. IZA Journal of Migration, 3 (13). ISSN 2193-9039 doi: 10.1186/2193-9039-3-13 Available at https://centaur.reading.ac.uk/66757/

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Published version at: http://dx.doi.org/10.1186/2193-9039-3-13
To link to this article DOI: http://dx.doi.org/10.1186/2193-9039-3-13

Publisher: Springer

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Cultural diversity and subjective well-being

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Abstract

This paper analyses the impact that diversity has on life satisfaction of people living in England. In England, and in many other countries, local communities are becoming more diverse in terms of country of birth, ethnicity and religion of residents, with unclear consequences on the well-being of people living in these communities. The results suggest that white British people living in diverse areas have on average lower levels of life satisfaction than those living in areas where diversity is low, while there is no correlation on average between diversity and life satisfaction for non-white British people and foreign born.

JEL codes: J31; J61; R23

Keywords: Diversity; Individual subjective well-being; Local Authority Districts

1. Introduction

One of the consequences of international migration is that in many countries local communities are becoming more diverse in terms of country of birth, ethnicity, and religion. This increase in diversity may have consequences for the well-being of residents. If diversity has a negative impact on well-being, a rapid increase in diversity may generate social problems and may decrease social cohesion (Putnam 2007). Despite this, the Universal Declaration on Cultural Diversity (UNESCO 2001) states the importance of cultural diversity not only for economic growth, but also "as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence" (Article 3).

The academic literature has provided arguments both in favour and against diversity. Arguments in favour of diversity point to positive correlations between diversity and employment (Nathan 2011; Ottaviano and Peri 2005), productivity and wages (Ottaviano and Peri 2005, 2006), the amount of (ethnic) services such as shops and restaurants (Mazzolari and Neumark 2012). Arguments against diversity point to the possibility of misunderstandings among people of different cultures (Horwitz and Horwitz 2007), a decrease in social capital (Alesina and La Ferrara 2000; Letki 2008; Sturgis et al. 2011), and social conflicts (Alesina and La Ferrara 2002; Sturgis et al. 2011; Putnam 2007). The ones mentioned above are all different aspects of people's lives that may be positively and negatively affected by diversity; all these aspects may contribute differently to people's overall well-being. Given the relevance that governments nowadays place on subjective well-being (Waldron 2010), and since the impact of immigration and of a diverse society is a highly debated topic (Finney and Simpson 2009), surprisingly little research has been done on the impact of diversity on well-being.

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This paper focuses on the impact that diversity has on people's overall satisfaction with their lives. In addition, rather than limiting the analysis to one measure of diversity, this paper compares three ways to operationalise the concept of cultural diversity: diversity by country of birth, ethnicity, and religion. In most studies the choice of how to measure diversity depends on data availability. It is unclear, however, whether people value different types of diversity differently. Finally, rather than restricting the analysis on the impact that diversity has on natives, this paper also analyses the impact that diversity has on ethnic minorities and foreign born people since it is possible that people belonging to a minority perceive the costs and benefits of diversity differently than people belonging to the majority.

This paper is related to research by Betz and Simpson (2013) and Akay et al. (2012). Betz and Simpson (2013) use cross-section data from the European Social Survey to analyse the impact of immigration on well-being of natives across European countries. They find that immigration, and especially recent immigrants, have a positive but very small impact on well-being of natives. The small impact may be related to the fact that Betz and Simpson (2013) compare countries, most of which are geographically rather large. In contrast, Akay et al. (2012) use the German Socio-economic Panel to analyse the impact of immigration on well-being across German regions and conclude that immigration has an impact on well-being of natives only in those regions where assimilation – either in terms of wages or measured by 'feeling German' – is low. In regions where immigrants are more assimilated, immigration does not seem to have any impact on well-being of residents. Rather than on the impact of immigration, the focus of this paper is on the impact of diversity, which can be interpreted as the result of various waves of immigration and emigration of foreign born (and of natives), and of fertility and adaptation of previous waves of immigrants. Although related, assimilation of immigrants in the way measured by the previous literature is a different concept from diversity: even people who feel they belong to the host country may still have diverse lifestyles that are inherited from their cultural upbringing. Similar to Akay et al. (2012), the focus of this paper is on one country to allow the use of a more detailed geography, since diversity in the local area is likely to be much more relevant for individual well-being than diversity in the whole country.

The results suggest that diversity has a negative impact on well-being of UK residents; this impact, however, varies across groups and partly depends on the way diversity is measured. White British people living in more diverse areas in terms of countries of birth and ethnicity have lower levels of life satisfaction on average than those living in areas where diversity is low. In contrast, the average level of life satisfaction of non-white British people and of foreign born does not seem to be affected by the level of diversity. It is possible that people belonging to minorities have different preferences for diversity. The level of diversity in an area may be one characteristic which is included in the choice of the area of residence by minorities, but is overlooked by people belonging to the majority, with resulting externalities. The results show no obvious differences between people living in rural rather than urban areas; however, there are relevant differences between homeowners and renters. The correlation between diversity and life satisfaction is more likely to be negative for those who have spent only few years at the current address and for those who do not feel that there is a large social capital in their neighbourhood. These results point to the possibility that people may adapt to diversity. If this is the

case, the problem that policy makers face is not the level of diversity, but the relationship between how quickly diversity increases, and how quickly residents are able to adapt to it.

2. Theoretical background

2.1. How can cultural diversity affect well-being?

An area is "culturally diverse" if it hosts a variety of groups with different habits and traditions. Cultural diversity may therefore be a result of ethnicity, country of birth, religion, and many other factors (Vertovec 2007), and may have various – and contrasting – effects on people's lives. We may consider cultural diversity both as a production amenity and as a consumption amenity; in both cases this amenity can be either positive or negative.

From the point of view of people's working lives, the literature suggests that firms with a diverse workforce are likely to enjoy different skills and problem-solving abilities which most likely complement each other, foster innovation and productivity, with positive impacts on wages (Page 2007). Diversity might also hinder communication (Horwitz and Horwitz 2007). A poor understanding of the common language might increase communication costs, create misunderstandings, conflicts and uncooperative behaviour with negative consequences on productivity and wages (Ottaviano and Peri 2006; Suedekum et al. 2014). If people prefer to work with those who are similar to themselves (Stahl et al. 2010), job satisfaction of people belonging to the majority may be lower in workplaces employing larger shares of minority workers (Haile 2013). These positive and negative mechanisms are likely to work simultaneously (Stahl et al. 2010), and which one prevails is still an open question.

Cross-sectional evidence based on English cities suggests that diversity in terms of country of birth might have a positive impact on employment growth (Lee 2011), although recent analyses using panel data suggest that part of the impact may be due to individual unobserved heterogeneity (Bakens et al. 2013; Longhi 2013; Ozgen et al. 2013). The negative impact of unemployment on well-being is also well-documented in the literature (Clark 2003; Winkelmann and Winkelmann 1998).

Hence, cultural diversity may be expected to have an impact on employment opportunities, wages and on relationships with other co-workers. Wages and interaction with co-workers are important aspects of people's jobs and an important component of people's well-being (Argyle 2001). In addition, cultural diversity might be perceived as a positive social amenity that leads to a larger variety of services offered such as (ethnic) shops and restaurants (Mazzolari and Neumark 2012), and may indicate the presence of a tolerant local population (Florida 2002). On the other hand, competition for scarce resources among culturally diverse groups may result in racism and social conflicts (Alesina and La Ferrara 2002; Putnam 2007; Sturgis et al. 2011) and a decrease in trust (Costa and Kahn 2003; Letki 2008).

In summary, diversity may have some positive and some negative impact on people's lives. Estimating the impact that diversity has on people's well-being can give us an idea on the balance between the positive and the negative impacts.

2.2. What measure of well-being?

The literature on subjective well-being distinguishes between two related dimensions: hedonic and evaluative well-being (Graham 2011; Kahneman and Deaton 2010). Hedonic

well-being is the result of positive and negative feelings which may derive from day-to-day conditions and experiences such as the immediate health state. Hedonic well-being is generally measured by questions about positive feelings (such as joy, happiness, or smiling), and negative feelings (sadness, worry, stress, or anger). The second measure, evaluative well-being, is the result of the evaluation of one's own life overall and is usually related to long-term goals and opportunities. Evaluative well-being is generally measured by questions about satisfaction with life as a whole and can be related to the utility framework commonly used in economics (Graham 2011).

Although in principle it would be useful to compare the impact of diversity on both hedonic and evaluative well-being, the data used in this paper only include measures of evaluative wellbeing. Furthermore, as argued by Graham (2011), for policy purposes evaluative wellbeing measures are likely to be more useful than hedonic ones.

2.3. The utility framework

The impact that cultural diversity has on people's lives may be analysed within the economic concept of utility. According to classical economic theories, individuals make choices that maximise their lifetime utility. The level of utility of individual i living in region r at time t (U_{irt}) can be interpreted as a function of two types of factors:

$$U_{irt} = f(IC_{irt}, NC_{rt}) \quad (1)$$

IC_{irt} are individual characteristics such as age, education, household structure and employment (Argyle 2001; Frey 2008); and NC_{rt} are the characteristics of the area where the individual lives. If people have a preference for diversity, those living in more diverse areas should have on average higher levels of utility even after controlling for the individual characteristics, and vice-versa.

The large literature on life satisfaction has analysed the impact of various individual and socio-economic characteristics and events, such as personality, gender, age, income, employment status (including the experience of unemployment), divorce, migration and so on (Diener et al. 1999; Stutzer and Frey 2010). Recent studies analyse the impact of various macro-level and institutional factors such as environmental quality or neighbourhood deprivation (Ferrer-i-Carbonell and Gowdy 2007; Knies et al. 2014; Morrison 2011; Shields et al. 2009).

To estimate the impact of the characteristics of the area, and of diversity in particular, we need to choose a geographical level of analysis. The literature focusing on the impact of diversity often uses rather small geographical areas such as neighbourhoods (Letki 2008; Sturgis et al. 2011). However, people's lives are not confined to their neighbourhood as they often travel across neighbourhoods, wards, and sometimes districts, for shopping, leisure, and work. District boundaries, rather than the more commonly used neighbourhoods, are geographically large enough to capture people's day-to-day activities but not too large to become meaningless for the analysis of the impact of diversity on life satisfaction.

The theory of compensating differentials suggests that, if people are free to move across districts, they choose the optimal location based on their expected utility in each location. The characteristics of the area should be part of this decision (Ballas and Tranmer 2012). Hence, people who expect lower utility and therefore lower life satisfaction from living in a highly diverse area will choose to live in areas where

diversity is low or will require compensation on other domains affecting their life satisfaction. If this is the case, in equilibrium diversity should have no impact on life satisfaction of respondents. On the other hand, it is possible that the location of the current job or of family and friends are more important criteria when choosing a location, while the level of diversity may be considered less important. On top of this, people may lack clear information on the level of diversity in an area, or on the possible costs and benefits of diversity. This lack of knowledge may be more important for some groups (the majority) than others (minorities). At least for some groups, diversity may be an unexpected externality and may have an impact on people's life satisfaction.

Individuals, however, are not always free to move. Beside psychological costs of moving, also monetary costs of moving may play a role. Some people may prefer to live in areas with a different level of diversity but may not have enough resources to move to such areas. Research on subjective wellbeing has shown that people living in precarious conditions adapt to diversity and can reach high scores on measures of hedonic well-being, but tend to score comparatively low on measures of evaluative well-being (Graham 2011). Consistently with the theoretical model, people unable to move to their preferred location should therefore score lower on the measure of life satisfaction.

The analysis of whether people adapt to living in areas with a level of diversity higher or lower than desired is not possible with cross-section data. If people do not adapt (or adapt slowly) to diversity, the empirical results may show a correlation between life satisfaction and the level of diversity in the area. A lack of impact may signal adaptation and that in the long run the level of diversity in the area becomes not relevant to life satisfaction (Powdthavee and Stutzer 2014).

3. Data and method

3.1. Data: understanding society[1]

To analyse the impact of diversity on individual well-being this paper uses 'Understanding Society, the UK Household Longitudinal Survey' (UKHLS). UKHLS is a longitudinal survey of households living in the UK, in which each adult member of the household is interviewed annually since 2009. The data include information on demographic characteristics, work and employment, as well as satisfaction with life overall. For the purpose of this paper, since the measures of diversity are time-invariant, we only use the first wave of UKHLS, with people interviewed between 2009 and 2010 (interviews for each wave are carried out over a period of two years, with two interview waves overlapping each calendar year). Because of data availability on some of the aggregate explanatory variables (see below), this paper focuses on people living in England (about 85% of the UKHLS sample).

As a measure of utility (U_{irt} in equation 1) it is nowadays common to use answers to questions on life satisfaction (Frey 2008). UKHLS asks respondents: "How dissatisfied or satisfied are you with your life overall?" and measures answers on a 7-point scale where 1 stands for "not satisfied at all"; 4 stands for "not satisfied nor dissatisfied"; and 7 stands for "completely satisfied". In this framework the answer to the satisfaction question (y_{irt}) is the observed outcome for the latent variable U_{irt} so that: $y_{irt} = 0$ if $U_{irt} <= 0$; $y_{irt} = 1$ if $0 < U_{irt} <= \mu_1$; ... $y_{irt} = 7$ if $U_{irt} > \mu_7$, where the μ are thresholds to be estimated[2].

UKHLS provides details on the area where the individual lives at the level of Unitary Authorities – Local Authority Districts (LAD – NUTS3 level). We use the 2011 English Census to compute the measures of diversity at the same geographical level.

3.2. Measures of diversity

It is common in the literature to measure diversity using an index of fractionalisation (F_r):

$$F_r = 1 - \sum_{k=1}^{K} \left(\frac{Group_{kr}}{Population_r} \right)^2 \quad (2)$$

where $Group_{kr}$ is a dummy which has value 1 if the individual belongs to group k and 0 otherwise; all k groups sum up to the $Population_r$. The index of fractionalisation ranges between 0 and 1 and measures the probability that two people randomly drawn from the population belong to the same group. Fractionalisation in region r depends on the number of different groups (K) in the area, and on their size (Alesina et al. 2003); for this reason, caution is needed in the comparison of indices computed on different numbers of groups.

Usually the majority group is included in the measure of diversity; however, since the majority group is often much larger than any other minority, it dominates the measure. It is useful to estimate models in which diversity includes only minorities (the proportion of the majority in the area can be included as an additional explanatory variable). Table 1 shows the various measures of diversity: by ethnicity, country of birth and religion, including or excluding the majority group from the measure of diversity. The indices are computed using the census and the groups used in the computation of the indices are listed in Appendix A.

Based on 327 districts in England, Table 1 shows that the different ways of measuring diversity lead to completely different pictures of how diverse each district is. For example, when measured by country of birth diversity ranges between 4.4% and 75.3% with a mean of 20.2% and a median of 15.5%. Despite the fact that in England there is substantial overlap between ethnicity and country of birth, and between country of birth and religious upbringing, the measures of ethnic diversity and diversity by country of birth differ substantially from the measure of religious diversity (see also Figure 1). Ethnic diversity ranges from 4.7% to 88.9% and its mean and median are 25.4% and 18.1%. These figures are larger than those for diversity by country of birth. The distribution of the measures of diversity by country of birth and ethnic diversity are relatively similar, while religious diversity has a much more compressed distribution, ranging from 32.7% to 78.1%, with a mean of 54.3% and a median of 53.1% (Figure 1 and Table 1).

Table 1 Measures of diversity

Observations: 327	Min	Mean	Median	Max
Diversity by country of birth	0.044	0.202	0.155	0.753
Proportion white British	0.167	0.842	0.903	0.976
Diversity by country of birth of foreign born population	0.492	0.831	0.845	0.896
Ethnic diversity	0.047	0.254	0.181	0.889
Ethnic diversity of non-white British population	0.870	0.990	0.998	1.000
Religious diversity	0.327	0.543	0.531	0.781

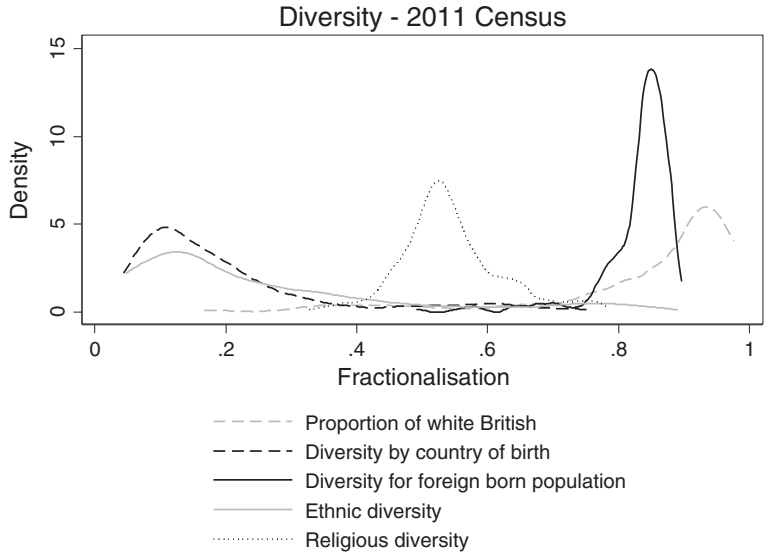

Figure 1 Distribution of the measures of diversity.

As expected, in most districts white British are the largest proportion of residents (the mean is 84.2% and the median is 90.3%). Excluding the proportion of white British from the measure of diversity by country of birth leads to a measure of diversity (of the foreign born population) which ranges from 49.2% to 89.6% with very large mean and median: 83.1% and 84.5%. This is also clear from Figure 1, which shows that the measure of diversity by country of birth is concentrated at one end of the distribution. In other words, the mean of the measure of diversity by country of birth is 0.202 if we include the British population and 0.831 if we exclude it. This indicates that, in the average district, if we randomly select two people from the non-British population the probability that they are born in the same country is 83.1%, while if we randomly select two people the probability that they are born in the same country is 20.2%. The impact of excluding the majority is even larger when we exclude whites from the measure of ethnic diversity. This suggests that although minorities do concentrate in some districts, within each district there are a large variety of minority groups.

Additional file 1: Table S1 shows the correlation across the different measures of diversity (used the Bonferroni method to compute statistical significance). With the exception of diversity of the foreign born population, all measures show rather large (positive or negative) correlations. For this reason it is inappropriate to include all these variables in the same model. We can however test their relevance using separate models. Furthermore, some of the measures, such as ethnic diversity of the non-white population, are too concentrated to be of interest for this research.

3.3. Modelling strategy

The impact that diversity may have on individual well-being can be estimated using a model such as:

$$y_{irt} = \alpha + \beta F_r + \gamma Controls_{irt} + \varepsilon_{ir} \tag{3}$$

where y_{irt} are answers to the question on satisfaction with life overall; F_r are the

measures of diversity; and $Controls_{irt}$ include individual characteristics such as age and its square, dummies for female, married/cohabiting, presence of children up to 4 years of age, presence of children aged 5–11 and aged 12–15, with no children used as reference group. The models also include a dummy for those who have a degree, and two dummies for employment status (one for those who have a job, and one for the unemployed, with inactive used as reference group). The models also include household income equivalised using the modified OECD equivalence scale to take into account the demographic composition of each household and the economies of scales this generates (de Vos and Zaidi 1997). Equivalised household income captures the amount of income to which each household member has access in a more appropriate way than per-capita income. Since some households have negative income (this is mostly associated with self-employment), the equivalised household income is included in levels rather than logs.

Since the data oversample certain ethnic minority groups (McFall 2012), and since there may be differences in the overall level of satisfaction across cultures, the models also include dummies for six ethnic groups: Indian, Pakistani, Bangladeshi, Caribbean, African and Mixed. These dummies are included only in the models estimated for non-white British and for foreign born, and the reference group includes all remaining ethnicities.

Individual characteristics such as personality have been found to be relevant determinants of satisfaction (Argyle 2001). When data on personality are not available, it is common to use answers to questions about satisfaction in other domains, such as satisfaction with health, to capture the impact of individual-specific unobservables that may have an impact on the way people answer to the questions on life satisfaction (Betz and Simpson 2013; Morrison 2011). Satisfaction with health is included in the models by means of six dummies, where the reference group is those who say they are "neither satisfied nor dissatisfied" with their health. Summary statistics of the individual-level variables are in Additional file 1: Table S2. Because of the way the data collection is organised, interviews are carried out for a period of two years: 2009 and 2010. To partly control for the impact of season the models also include dummies for the month and for the year of the interview.

The measures of diversity are computed using the 2011 census. Internal mobility across districts is relatively low and there have been no significant changes in immigration between 2009 and 2011. There are no reasons to expect the measures of diversity in 2011 to be significantly different from what they might have been in 2009–2010. To partly control for the fact that minorities tend to locate in more deprived areas, the models include the average of the Index of Multiple Deprivation, which is provided by ONS for 2010. This index is a composite measure which includes seven different dimensions of deprivation (income, employment, health, education, crime, barriers to housing and services, and living environment) and is considered to be a reliable measure to compare deprivation across districts (Noble et al. 2006; McLennan et al. 2011). This index, however, uses the geographical codes of the 2001 census, which do not perfectly match those of the 2011 census; observations for people living in 11 non-matching districts are dropped from the analysis. This exclusion is exogenous to our analysis and the results of models excluding the index of deprivation are consistent with those including the index. The models also include a dummy for people living in rural areas.

Finally, since the dependent variable is coded on a 7-points scale, it is common practice to estimate equation (3) using ordered logit or probit models. However, linear probability models in our case give similar result to probit models; for ease of interpretation, and to avoid having to show marginal effects for each of the seven levels of life satisfaction, the tables show the results of models estimated by OLS (Ferrer-i-Carbonell and Frijters 2004). Since the indices of diversity vary only by district and are used in an individual-level regression, the standard errors are clustered by district (Moulton 1990).

3.4. Endogeneity

One of the problems in estimating the impact of diversity is endogeneity, which may be due to self-selection and to reverse causality. Minorities – and especially immigrants – may be attracted or self-select into areas with certain unobserved characteristics, which may also be correlated with the average level of life satisfaction. Modelling self-selection in cross-sectional data is not straightforward.

It is possible however to partly deal with the issue of reverse causality. From the point of view of the majority, people who prefer – or are likely to benefit from – higher levels of diversity may be more likely to locate in more diverse areas, while those who dislike – or are likely to be negatively affected by – diversity may be more likely to locate in areas that are more homogeneous. Since the variable of interest here is life satisfaction, the problem of endogeneity is slightly different than in the rest of the literature. If people who prefer diversity settle in more diverse districts while those who dislike diversity settle in more homogeneous ones, and the decision of where to live is optimal, we should expect no correlation between diversity and individual well-being. We may observe an impact of diversity on life satisfaction if diversity is not taken into account when choosing the district of residence. For example, the choice of the district of residence may be related to the location of the job and/or family and relatives. A positive coefficient may then indicate either that diversity has a positive impact on life satisfaction, or that – for some reason – happier people (with a higher level of life satisfaction) end up living in more diverse areas. As a sensitivity analysis, therefore, we also use instrumental variables.

The literature has suggested various instruments. The most common is a lag of the measure of diversity, typically computed from the previous census (Card 2005; Dustmann et al. 2005). An additional instrument proposed in the literature is the measure of diversity in the larger area. Dustmann and Preston (2001) suggest that even if the location decision of individuals is endogenous when geographically small areas are considered, the endogeneity problem decreases with the geographical size of the area considered. They also show that averages from larger areas are a good instrument for the endogenous variable at the smaller geographical level. In this case we can use diversity at the level of counties (91 in our analysis), or at the level of the nine Government Office Regions. The results show that the lag of the measure of diversity and diversity at the larger geographical level (either counties or Government Office Regions, depending on the measure of diversity) are appropriate instruments.

4. Results

4.1. Impact of diversity on life satisfaction

Table 2 shows the results of the estimation of equation (3) separately for white British, non-white British, and foreign born people. The results in the first column show the

Table 2 Impact of diversity on satisfaction with life overall

	(1)	(2)	(3)	(4)
	Country of birth (not UK)	**Country of birth**	**Ethnicity**	**Religion**
White British (N = 22,635)				
Proportion of white British	0.252***			
	(0.066)			
Fractionalisation by …	−0.069	−0.310***	−0.188***	−0.239
	(0.152)	(0.068)	(0.053)	(0.145)
R2	0.383	0.383	0.383	0.382
Non-White British – Second generation (N = 2,188)				
Proportion of white British	0.120			
	(0.135)			
Fractionalisation by …	0.449	−0.087	−0.201	−0.169
	(0.396)	(0.152)	(0.128)	(0.337)
R square	0.365	0.364	0.365	0.364
Foreign born – Immigrants (N = 5,571)				
Proportion of white British	0.075			
	(0.093)			
Fractionalisation by …	0.443	−0.076	−0.115	−0.335
	(0.370)	(0.102)	(0.081)	(0.219)
R2	0.376	0.376	0.376	0.376

Standard errors in parenthesis are clustered by district; other covariates included in the model: six dummies for satisfaction with health; dummies for female, married/cohabiting; presence of children aged 0–4, 5–11 and 12–15; six ethnic groups (where applicable); having a degree; whether employed; whether unemployed; equivalised household income; age and its square; dummy for rural area; index of multiple deprivation (average by district).
*Significant at 5%, **Significant at 5%, ***Significant at 1%.

impact of diversity by country of birth of the foreign born population; the results in the second column show the impact of diversity by country of birth, including British people in the measure of diversity. The last two columns show the impact of ethnic and religious diversity. For reasons of space the other covariates are not shown here but the coefficients are in line with the previous literature. Women have higher levels of life satisfaction than men, while the impact of age follows a U-shaped curve, with a turning point around the age of 40–42. Life satisfaction is also positively correlated with being married, having higher levels of education, higher equivalised household income and is negatively correlated with the presence of children and with unemployment.

The top panel of Table 2 suggests that life satisfaction of white British respondents is comparatively higher for those who live in areas with a higher proportion of other white British (column 1), and where diversity by country of birth and by ethnicity is lower (columns 2 and 3). After controlling for the proportions of white British in the district, however, diversity by country of birth of the immigrant population does not seem to have any relevant impact (column 1). Religious diversity in the district of residence also does not seem to have any statistically significant impact on life satisfaction of white British people. This is consistent with Putnam's (2007) suggestion that (in the US) the importance of religious identity has faded over time more quickly than the importance of racial and ethnic identity. It is also worth noting that religious diversity has a more compressed distribution than ethnic diversity and diversity by country of birth.

Models estimated on non-white British and on foreign born residents show a similar pattern, although none of the coefficients is statistically significant and the regression coefficients are often closer to zero than in the case of white British. This may suggest that people belonging to the majority may prefer to live in districts where there is a large presence of people belonging to the majority, while for people belonging to minorities the 'cultural' composition of the district has no relevant impact on life satisfaction. One possible explanation for this difference is that people belonging to minorities may be more aware of the costs and benefits of diversity, and may take them into consideration when choosing the district of residence. For people belonging to the majority lack of such knowledge may result in externalities from diversity. The difference across groups is not the result of lack of variability in the measure of diversity in the district where non-white British and foreign born people live. Figure 2 shows the distribution of the various measures of diversity based on the district of residence of respondents (individual-level data). Although the variability of the measures of diversity is lower than for the majority, it is not negligible for minorities: it is not the case that all minorities in the UKHLS sample live in high-diversity districts.

The minority groups may be relatively heterogeneous and include people with different ethnicities and countries of birth. Rather than diversity per se, also for minority groups what may affect life satisfaction may be the presence of people sharing the same 'culture'. The small number of observations prevents us from more in-depth analyses; however, recent research has shown that in most cases minority groups' life satisfaction is not affected by the presence of co-ethnics in the neighbourhood (Knies et al. 2014). This result also supports the idea that after few years of residence in the UK immigrants – especially those coming from countries that are very different than the UK – tend to feel British (Manning and Roy 2010), and that ethnic British people have higher levels of Britishness than white British people themselves (see Nandi and Platt (2014); see also Masella (2013) for cross-country evidence). Nevertheless, even if immigrants do not perceive a clash among cultures, British people do (Manning and Roy 2010).

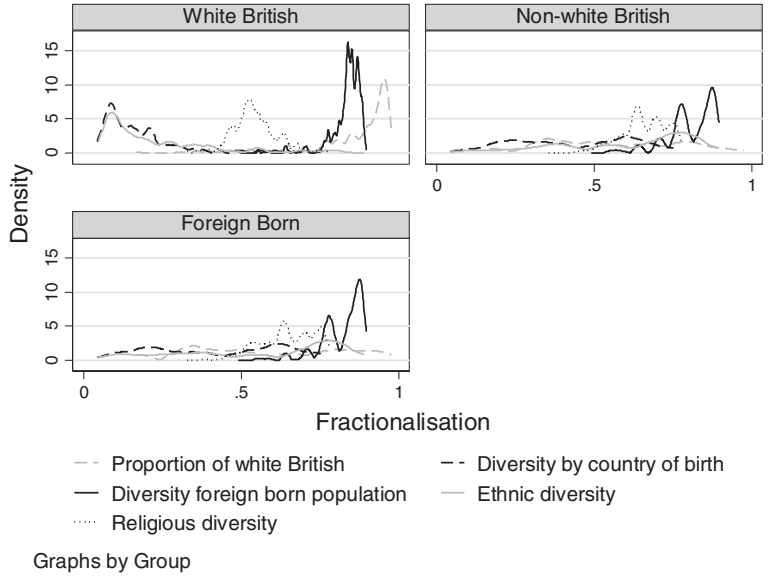

Figure 2 Distribution of the measures of diversity by respondents' district of residence.

4.2. Sensitivity analysis: instrumental variable estimations

As already mentioned, OLS results might be biased by endogeneity; the results of the IV estimators are in Table 3. While the lags of the endogenous variables are appropriate instruments for all measures of diversity, the best additional instrument for fractionalisation by country of birth and ethnicity is the measure of diversity at the level of Government Office Regions. For religious fractionalisation the best additional instrument is the same measure at the county level. The weak identification tests have extremely high values and are all large relative to the critical values suggested by Stock and Yogo (2005). The Hansen J tests for over-identifying restrictions are not rejected, except for the case of religious diversity for white British people.

For white British the results of the IV estimations show larger coefficients than the OLS estimations, while for non-white British and foreign born people the IV coefficients are lower than the OLS ones. This confirms the previous conclusion that white British people living in districts with higher proportions of white British have on average comparatively higher levels of satisfaction with life, while those living in districts that are more diverse in terms of country of birth or ethnicity – and to some extent religion – tend to have lower levels of satisfaction. Diversity does not seem to have any correlation with life satisfaction of non-white British and foreign born residents.

4.3. Possible explanations for differences across groups

It is perhaps surprising that diversity has a negative impact on satisfaction with life of white British people and that this differs from the impact on non-white British and on immigrants. This section investigates possible reasons for the negative impact of immigration and for differences across groups. For simplicity only the models including the measure of diversity computed on the whole population, those using ethnic diversity and those using religious diversity are analysed, while the models including jointly the share of white British people and the measure of diversity in the foreign born population are excluded from this analysis.

Since most minorities tend to live in more urbanised areas, we may expect that the probability of having contacts with 'culturally diverse' people differs between more and less urbanised areas. More and less urbanised areas may also differ in the level of openness to "different" people. To analyse whether the results are driven by differences between rural and urban areas, we include in the model the interaction between the measure of diversity and the dummy for living in a rural area. The results are in Additional file 1: Table S3. Similar to the previous results, diversity by country of birth and ethnic diversity have a negative correlation with life satisfaction for white British people, but no correlation for non-white British and for immigrants. The interaction terms are never statistically significant suggesting no differences between rural and urban areas.

The difference across groups may be due, for example, to differences in the propensity to migrate to a different area. As already mentioned, some people may choose their place of residence based on the location of their friends and relatives and therefore may accept to live in areas that, in terms of diversity, are sub-optimal. It is not easy to measure ties and the impact that they may have on the propensity to move to different areas; within this dataset we can compare home owners and renters. Moving costs are likely to be higher for homeowners than for renters. People in socially rented accommodations may

Table 3 Impact of diversity on satisfaction with life overall, instrumental variables

	(1)	(2)	(3)	(4)
	Country of birth (not UK)	**Country of birth**	**Ethnicity**	**Religion**
White British (N = 22,725)				
Proportion of white British	0.294***			
	(0.064)			
Fractionalisation by …	−0.044	−0.352***	−0.215***	−0.318**
	(0.186)	(0.065)	(0.051)	(0.144)
First stage regressions for Prop white British				
Proportion of white British (by county)	0.098***			
Proportion of white British 2001	1.187***			
Fractionalisation by … (by county)	0.147**			
Fractionalisation by … 2001	−0.109**			
First stage regressions for Fractionalisation				
Proportion of white British (by county)	0.007			
Proportion of white British 2001	0.090***			
Fractionalisation by … (by county/region)[a]	0.389***	0.128***	0.120***	−0.067***
Fractionalisation by … 2001	0.621***	1.068***	1.053***	0.854***
Weak identification test (Kleibergen-Paap)	6694	61993	69434	90807
Hansen J test for over-identifying restrictions	1.577	0.577	2.446	10.072
Hansen J test P-value	0.455	0.447	0.118	0.001
Non-White British – Second Generation (N = 2,188)				
Proportion of white British	0.080			
	(0.146)			
Fractionalisation by …	0.200	−0.047	−0.136	−0.027
	(0.472)	(0.159)	(0.142)	(0.346)
First stage regressions for Prop white British				
Proportion of white British (by county)	0.142***			
Proportion of white British 2001	1.038***			
Fractionalisation by … (by county)	0.244***			
Fractionalisation by … 2001	−0.108*			
First stage regressions for fractionalisation				
Proportion of white British (by county)	−0.007			
Proportion of white British 2001	0.132***			
Fractionalisation by … (by county/region)[a]	0.246*	0.180***	0.169***	−0.111***
Fractionalisation by … 2001	0.670***	0.887***	0.806***	0.779***
Weak identification test (Kleibergen-Paap)	1745	19137	10146	11120
Hansen J test for over-identifying restrictions	9.118	2.087	1.931	0.005
Hansen J test P-value	0.010	0.148	0.165	0.944
Foreign born – Immigrants (N = 5,571)				
Proportion of white British	0.066			
	(0.094)			
Fractionalisation by …	0.489	−0.046	−0.071	−0.274
	(0.400)	(0.105)	(0.086)	(0.233)
First stage regressions for Prop white British				
Proportion of white British (by county)	0.155***			

Table 3 Impact of diversity on satisfaction with life overall, instrumental variables *(Continued)*

Proportion of white British 2001	1.031***			
Fractionalisation by … (by county)	0.270***			
Fractionalisation by … 2001	−0.126**			
First stage regressions for fractionalisation				
Proportion of white British (by county)	0.004			
Proportion of white British 2001	0.124***			
Fractionalisation by … (by county/region)[a]	0.344***	0.196***	0.211***	−0.099***
Fractionalisation by … 2001	0.609***	0.875***	0.790***	0.784***
Weak identification test (Kleibergen-Paap)	2371	62611	42248	39841
Hansen J test for over-identifying restrictions	5.910	1.301	0.102	1.657
Hansen J test P-value	0.052	0.254	0.750	0.198

Standard errors in parenthesis are clustered by district; other covariates included in the model: six dummies for satisfaction with health; dummies for female, married/cohabiting; presence of children aged 0–4, 5–11 and 12–15; six ethnic groups (where applicable); having a degree; whether employed; whether unemployed; equivalised household income; age and its square; dummy for rural area; index of multiple deprivation (average by district).
[a]The instrument is the measure of diversity at county level (NUTS2) for religion, and at the Government Office Region level (NUTS1) for country of birth and ethnicity.
*Significant at 5%, **Significant at 5%, ***Significant at 1%.

also have a negative incentive to move because of their comparatively low income and because of the difficulty of finding alternative affordable accommodation elsewhere. We may however expect private renters to have lower moving costs and to be less affected by diversity in their life satisfaction than the other two groups. The literature has shown differences in homeownership rates across minority groups and the majority (Hoff and Sen 2005), while higher poverty rates among minorities (Barnard and Turner 2011; Garner and Bhattacharyya 2011) also suggest differences in the propensity to live in a socially rented accommodation. These differences may explain heterogeneity across groups in the correlation between diversity and well-being.

Additional file 1: Table S4 shows the results of models including a dummy for homeowners (own outright or with a mortgage), one for those living in socially rented accommodations, and their interaction with the measure of diversity. White British people who own their home show a negative correlation between diversity and life satisfaction, especially ethnic and religious diversity. Religious diversity seems to be negatively correlated with life satisfaction also for those who are in socially rented accommodations. People in privately rented accommodations (the reference group) do not seem to be affected by diversity; this group of people is more likely to have lower moving costs. People who have higher moving costs do seem to be negatively affected by diversity; this may suggest lack of (or slow) adaptation to a negative situation.

This relationship seems reversed for non-white British people. The correlation between diversity and life satisfaction – which refers to those who live in privately rented accommodations – is negative. This negative impact is mitigated for homeowners and possibly positive for people in socially rented accommodations. There does not seem to be an impact of diversity for immigrants.

These contrasting results suggest that homeownership is perhaps a proxy for something different than ties. Being less likely to move, homeowners and people in socially rented accommodations may feel more attached to their neighbourhood and may be more likely to create social ties and to bond with other neighbours. This type of social capital may

also confer more benefits for people belonging to the minority than for those belonging to the majority and may partly explain the previous finding for homeowners. Additional file 1: Table S5 compares people with different length of residence at the same address by adding the number of years spent at the same address and two interaction terms: one between the measure of diversity and a dummy for those who have lived at the same address for 4–9 years, and one between the measure of diversity and a dummy for those who have lived at the same address for 10 years or more. Short stays are the reference group. The results show a negative correlation between the level of diversity in an area and the average level of life satisfaction for both white and non-white British people. However, those who have lived at the same address for the last 4–9 years show a reduction in the negative correlation, consistent with the idea of adaptation. Non-white British people who have lived at the same address for the last 10 years or more show a positive correlation between diversity and life satisfaction. The direction of causation cannot be analysed here since it should be based on panel data and time-varying measures of diversity. These results however suggest that people may adapt, although the process of adaptation may require a long period of time.

The final analysis involves social capital. The dataset includes various questions about relationships with neighbours. Questions relevant for the purpose of this analysis are: 1. I feel like I belong to this neighbourhood. 2. The friendships and associations I have with other people in my neighbourhood mean a lot to me. 3. If I needed advice about something I could go to someone in my neighbourhood. 4. I borrow things and exchange favours with my neighbours. 5. I would be willing to work together with others on something to improve my neighbourhood. 6. I like to think of myself as similar to the people who live in this neighbourhood. 7. I regularly stop and talk with people in my neighbourhood. Possible answers are: a. strongly agree; b. agree; c. neither agree nor disagree; d. disagree; or e. strongly disagree. A dummy can be computed which is one for those who strongly agree with at least one of the previous sentences and zero otherwise. This is a measure of how respondents perceive their neighbourhood, which, geographically, is likely to be smaller than districts (on which the measures of diversity are based). The results are in Additional file 1: Table S6. The models include the dummy for "high" social capital and its interaction with the measure of diversity. The results confirm the negative correlation between diversity and life satisfaction for white British people. Perhaps surprisingly, white British people with comparatively higher social capital seem to be negatively affected by religious diversity. It is possible however that white British living in neighbourhoods with high social capital tend to concentrate in predominantly white neighbourhoods. For non-white British people the results are – again – reversed. While diversity is on average associated with lower levels of life satisfaction, those with comparatively higher social capital are more likely to show a positive correlation (the coefficient of the interaction term is generally much larger than the coefficient of the measure of diversity). Also in this case there seems to be no correlation between diversity and life satisfaction for immigrants.

Overall these results point to large heterogeneity across people which relates not only to their ethnic and migration background, but also to other characteristics which may be related to the area where they live. A more detailed dataset would be needed to

explore the choices and consequences of people's location choices, and reasons for (not) moving.

5. Conclusions

The current levels of international migration mean that modern societies are experiencing unprecedented levels of diversity. Since most governments nowadays recognise the importance of subjective measures of well-being for policy (Waldron 2010), and since the impact of immigration and of a diverse society is a highly debated topic (Finney and Simpson 2009), surprisingly little research has been done on the impact that cultural diversity has on individual subjective well-being. This paper fills this gap in the literature by analysing the impact that different types of cultural diversity – measured by country of birth, ethnic background or religion – have on well-being of people living in England. The impact is estimated separately for white British, non-white British and foreign born people.

The results suggest that white British people living in diverse areas in terms of countries of birth, ethnicity or religion have on average lower levels of life satisfaction than those living in areas where diversity is low. On the other hand, life satisfaction of non-white British and foreign born residents does not seem to be affected by the level of diversity. It is possible that white British's choice of the district of residence is due to e.g. family ties and the level of diversity in the area is not considered an important factor in this decision. Alternatively, it is possible that people belonging to the majority are not well aware of the level of diversity in each district and/or of the costs and benefits of diversity. Minorities, in contrast, may consider diversity as a relevant attribute of a district, may be more aware – than people belonging to the majority – of costs and benefits of diversity, and may therefore include diversity in their choice of the district of residence.

The lower importance that white British seem to place on religious diversity than on ethnic diversity or on diversity by country of birth may be the result of a process of adaptation. Perhaps white British people have adapted to religious diversity but not (yet) to other types of diversity. The difference between white British, non-white British and immigrants may be explained if some groups adapt more quickly than others. Answers to these questions would require the combination of panel data with reliable measures of diversity that vary over time. Such kinds of data are still rare.

The negative correlation between diversity and subjective well-being is not a rural/urban phenomenon; however, there are relevant differences in the impact of diversity depending on homeownership, length of stay at the current address, and social capital. While white British people who own their home and to some extent those who live in a neighbourhood with higher social capital seem to "dislike" diversity; non-white British people who are homeowners and those who live in a neighbourhood with higher social capital show positive correlations between diversity and life satisfaction. For both groups those who have lived at their current address for the longest time show more positive – or less negative – correlations.

In summary, lack of knowledge about the costs and benefits of diversity and slow adaptation to higher diversity may have negative consequences for well-being; these negative effects may be felt more strongly by the native population. If this is the case,

policies to promote multiculturalism, increase both bonding and bridging social capital, and improve people's knowledge of diversity should reduce the negative impact of diversity on well-being.

It is worth pointing out, however, that the conclusions of this paper are based on the analysis of cross-section data. Future research may analyse which characteristics majority and minorities take into account when choosing the district of residence, and may compare life satisfaction outcomes of people moving across districts. Furthermore, an appropriate analysis of the impact of policies to promote multiculturalism should compare life satisfaction of residents before and after the intervention. Ideally, the comparison would include a control group of comparable areas where no policy is implemented. Again, this is not possible with the data used in this paper and it therefore left for future research.

Endnotes

[1]UKHLS data are available from the Data Archive at the University of Essex (www.data–archive.ac.uk): University of Essex. Institute for Social and Economic Research and NatCen Social Research, Understanding Society: Waves 1–3, 2009–2012 [computer file]. 5th Edition. Colchester, Essex: UK Data Archive [distributor], November 2013. SN: 6614 http://dx.doi.org/10.5255/UKDA-SN-6614-5. Understanding Society: Waves 1–2, 2009–2011: Special Licence Access, Local Authority District [computer file]. 3rd Edition. Colchester, Essex: UK Data Archive [distributor], March 2013. SN: 6666, http://dx.doi.org/10.5255/UKDA-SN-6666-3. Census statistics are available from ONS (www.nomisweb.co.uk/default.asp).

[2]Various studies highlight difficulties in measuring subjective well-being. For example, it is well-known that answers to questions on life satisfaction partly depend on mood, on the previous questions asked in the survey and on other survey characteristics (Kahneman and Krueger 2006; Conti and Pudney 2011). It has also been found that temperament and personality tend to have a higher explanatory power than life event; nevertheless, answers to questions about life satisfaction correlate well with various types of life events (Kahneman and Krueger 2006; Diener et al. 2013). A comprehensive discussion of the reliability and validity of these types of measures is out of the scope of this paper; more detailed recent discussions can be found in Kahneman and Krueger (2006), Diener et al. (2013).

Appendix A

The measure of diversity by country of birth is computed on 16/17 groups: 1. Western Europe (EU15), 2. Eastern Europe (EU12), 3. Other Europe, 4. North Africa, 5. Central and West Africa, 6. South and East Africa, 7. Middle East, 8. East Asia, 9. South Asia, 10. South-East Asia, 11. Central Asia, 12. North America, 13. Central America, 14. South America, 15. Caribbean, and 16. Antarctica and Oceania. We also include 17. UK born people in the measure of diversity which includes everybody in the population. The measure of ethnic diversity is computed on 11 groups: 1. white British, 2. white other, 3. mixed race, 4. Indian, 5. Pakistani, 6. Bangladeshi, 7. other Asian, 8. black African, 9. other Black, 10. Arabs, and 11. other ethnic groups. The measure of religious diversity is computed on 10 groups: 1. Christian, 2. Buddhist, 3. Hindu, 4. Sikh, 5. Jewish, 6. Muslim, 7. other religion, 8. other beliefs, 9. religion unknown, and 10. no religion. The choices of these groups are mostly due to data availability.

Additional file

Additional file 1: Table S1. Correlation across the measures of diversity, **Table S2.** Summary statistics of individual-level variables, **Table S3.** Impact of diversity on satisfaction with life overall – rural–urban differences, **Table S4.** Impact of diversity on satisfaction with life overall – house tenure, **Table S5.** Impact of diversity on satisfaction with life overall – length of stay in the area, **Table S6.** Impact of diversity on satisfaction with life overall – social capital.

Competing interests
The IZA Journal of Migration is committed to the IZA Guiding Principles of Research Integrity. The author declares that she has observed these principles.

Acknowledgements
I would like to thank the Editor and two anonymous referees for their comments on previous versions of this paper. I would also like to thank participants to the 51st Congress of the European Regional Science Association (Barcelona, Spain, September 2011); to the International Workshop on Economic Impacts of Immigration and Population Diversity (University of Waikato, Hamilton, New Zealand, April 2012); to the NORFACE Migration Interdisciplinary Conference on Migration: Global Development, New Frontiers (University College London, UK, April 2013); to the 53rd Congress of the European Regional Science Association (Palermo, Italy, August 2013); and the members of the MIDI-REDI project for helpful discussions.
This work is part of the project "Migrant Diversity and Regional Disparity in Europe" (MIDI-REDI) funded by NORFACE; financial support from NORFACE research programme on Migration in Europe - Social, Economic, Cultural and Policy Dynamics is acknowledged. This work also forms part of a programme of research funded by the Economic and Social Research Council (ESRC) through the Research Centre on Micro-Social Change (MiSoC) (award no. RES-518-28-001). The support provided by ESRC and the University of Essex is gratefully acknowledged.

Responsible Editor: Amelie F Constant

Received: 25 February 2014 Accepted: 25 June 2014
Published: 14 Jul 2014

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10.1186/2193-9039-3-13
Cite this article as: Longhi: **Cultural diversity and subjective well-being.** *IZA Journal of Migration* 2014, 3:13

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