

Divergent Responses to Local Diversity: Outgroup differences and the impact of personality

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Abstract:

Recent research has shown that differences in personality can help explain support or hostility towards immigration. Personality differences may also be related to the likelihood of contact with immigrant groups, as well as the effect of that contact. Using attitudinal measures from the British Election Study, this research confirms the importance of personality in predicting immigration attitudes. Furthermore, it shows that the effects of two Big Five traits, openness and extraversion, depend on the concentration of immigrants at a local level. In areas with high levels of immigrants, these traits more strongly associate with supportive attitudes. This may be due to more open and extraverted individuals having greater levels of contact with immigrants. Moreover, by looking at local concentrations of Western European immigrants, Eastern European immigrants, and immigrants from predominantly Muslim countries, this study shows that only greater concentrations of Western European immigrants are associated with increases in immigration support, while in contrast, greater concentrations of immigrants from Muslim countries are associated with increases in hostility. These findings demonstrate that how individuals respond to local immigration levels is likely to depend both on their personality and the immigrant group in question.

Keywords:

Brexit, Contact Hypothesis, Immigration Attitudes, Personality, UK

Word Count: 8925

Introduction

Immigration has become central to many contemporary political debates, and anti-immigration parties and politicians have risen to prominence in many countries. The unprecedented UK vote to leave the European Union, for example, was largely fueled by fears over immigration (Clery et al., 2017). This growing salience of immigration may be a consequence of increased immigration levels, a backlash effect. How one responds to changes in immigration levels, however, is not uniform. This paper focuses on the impacts of local immigration levels in the UK. I argue that the way one responds to rising numbers of immigrants in their local area will greatly depend on both their own personality, as well as the origin of the immigrants.

Personality, which shapes our behavior and emotions, is likely to impact how we respond to changes in our neighborhood. It has been shown to strongly shape our general political attitudes (Mondak, 2010) and, more recently, been found to predict prejudice and immigration attitudes (e.g. Akrami et al., 2011; Dinesen et al., 2016; Gallego & Pardos-Prado, 2014; Sibley & Duckitt, 2008). This should not be surprising, as we know that prejudice and immigration attitudes are linked to emotional reactions (Brader et al., 2008). Beyond this, one's personality has been shown to impact friendships and contact networks (Harris & Vazire, 2016; Selden & Goodie, 2018), which is particularly relevant for immigration attitudes.

As the concentration of immigrants increases in a local area, there is an increased chance of contact between members of the majority community and immigrants. Contact theory (Allport, 1954) argues that these interactions, especially close ones, should reduce prejudice and hostility towards the minority group. A meta-analysis of the large literature on this subject found that contact typically does reduce prejudice, and while close contact has a stronger effect, even impersonal contact can improve relations (Pettigrew & Tropp, 2006). However, positive responses to contact are not a given, and some studies have indeed found increases in prejudice and hostility from contact (Enos, 2014, Hopkins et al., 2014; Johnston et al., 2015; Karreth et al., 2015; Quillian, 1995), supporting what we can call conflict theory (Blumer, 1958). As areas become more diverse, one's personality may begin to take up an even larger role in determining responses to these changes. We cannot expect all people to be equally likely to strike up a conversation or begin a new friendship with people from other countries and cultures. As personality affects so much, it seems unlikely to not impact patterns of contact.

Whether contact takes place, or even how deep it is likely to be, is only part of the equation. We cannot assume everyone would interpret and be affected by the same experiences in the same way. If personality shapes how we behave and feel about the world, it is likely to influence reactions to the same experiences. What one person feels as threatening, might be exciting or enriching to another. Whether through contact patterns, or through different threat perceptions, research is beginning to find an interaction between immigration levels and personality (Ackermann & Ackermann, 2015; Ackermann et al., 2018a; Danckert et al., 2017). This provides strong evidence that in more diverse environments the role of personality shifts. However, the interactions found in these studies differ. They differ in which traits were found to moderate the impact of diversity and contact, as well as whether the traits became more or less powerful in diverse environments. Some of this may be due to differences in datasets and methodology, however it also indicates that context may play a large role in determining response patterns.

When considering distinct reactions to rising immigration numbers, personality is not the only variable to consider. Who the immigrants are should matter. This is not to blame or target any particular group, but to simply understand that we should not expect that contact is equally likely, regardless of the origin of the immigrant group. Nor should we expect that the depth, quality, and positivity of the experience is equally likely. Research has shown that attitudes towards immigrants differ depending on the group (Brader et al., 2008; Dustmann & Preston, 2007; Ford et al., 2012; Hainmueller & Hangartner, 2013; Hainmueller & Hopkins, 2015), and while there has not been much research directly comparing the effects of contact with different ethnic groups, it seems unlikely that pre-existing beliefs are irrelevant to our expectations. The situation may arise that contact between those groups where it may be most beneficial in alleviating prejudices, may be least likely to occur, due to those same prejudices. One's personality may then serve to exaggerate or dampen the effects of these pre-existing beliefs.

Through analysis of personality and attitudinal measures from the British Election Study and government sources of local immigration data, this study helps us to disentangle some of these issues. This study specifically compares the effects of living near three different immigrant groups: Western European immigrants, Eastern European immigrants, and immigrants from predominantly Muslim countries. This differentiation allows the study to look at how contact effects may vary depending on the kind of outgroup in question.

This study contributes to the literature in three main ways. First, it confirms the importance of personality as a determinant of immigration attitudes. Unlike other studies in this area, however, it finds the strongest predictors of immigration attitudes are openness and conscientiousness, reflecting the broader personality findings. Second, by modelling several immigrant groups together, it finds strong evidence that a distinction between immigrant groups is necessary. While higher local concentrations of Western European immigrants are associated with much more positive attitudes toward immigration, no such relationship was found for Eastern European immigrants, and higher concentrations of immigrants from Muslim countries are associated with more negative attitudes towards immigration. Third, this study found evidence for an interaction between the traits of openness and extraversion, and immigrant concentrations. These interactions indicate that as immigration levels rise, irrespective of group, these traits have a larger impact on immigration attitudes, with those high in the traits becoming more positive towards immigration than those low on the traits.

Immigrant Groups and Contact

Initial attempts to understand immigration attitudes have focused on whether and to what extent these attitudes are determined by economic or cultural concerns (Hainmueller & Hopkins, 2014; Sides & Citrin, 2007; Sniderman et al., 2004). Research has made it clear that while both are relevant to voters (e.g. Hainmueller & Hopkins, 2015), cultural concerns seem to dominate in certain contexts (Card et al., 2012; Carey, 2002). Schneider (2008) argues that in Europe higher immigration levels do in general produce a backlash against immigration, and this is driven by cultural concerns and a fear of conflict over values, and not economic competition. This perceived conflict of values is likely connected to and strengthened by prejudice, which has

also been associated with negative views towards immigration (e.g. Hainmueller & Hopkins, 2014).

This backlash effect is most apparent when looking at changes in immigration numbers, rather than overall levels. Kaufmann (2017) showed that, in the UK, areas with established minority ethnic groups were less hostile towards immigration and less likely to support UKIP. In contrast, in areas that showed rapid ethnic change, UKIP support was higher and attitudes were more hostile to immigration. These were longitudinal data, indicating this effect was not due to self-selection. This effect could be due to two related phenomena. The first is that people become used to living around immigrants, and this gradually reduces perceived threats associated with them. The second is that, over time, people have more and more contact with immigrants, and this reduces perceived threats and prejudices.

Contact theory (Allport, 1954) argues that hostilities and prejudices between groups should decrease as contact, and especially close contact, occurs between members of those groups. Though it was not originally developed with immigration as its focus, if prejudices and cultural fears are behind much of the hostility towards immigration, contact between members of the majority population and immigrants should lessen those concerns. A large number of studies have now indeed found that contact with immigrants is associated with less hostile attitudes (Ellison et al., 2011; Kokkonen et al., 2016; Laurence, 2014; McLaren, 2003; Savelkoul et al., 2011; Schlueter & Scheepers, 2010; Schneider, 2008). This is not necessarily causal, as one would expect those who are already less hostile to immigration would be more likely to befriend and associate with immigrants. However, Laurence (2014) shows that areas with more diversity have more interethnic ties, and both McLaren (2003) Kokkonen et al. (2016) show an interaction between the percentage of immigrants in areas and contact. As immigration levels increase, attitudes diverge more and more between those who have immigrant contact and those who do not.

This general trend, however, may vary by immigrant group. Different immigrant groups may be more or less likely to come into contact with the majority population, and they may also have different prejudices and cultural concerns associated with them. Cultural concerns, in general, are amplified for more different groups (Brader et al., 2008; Dustmann & Preston 2007; Ford et al., 2012; Hainmueller & Hangartner, 2013; Hainmueller & Hopkins, 2015). Potential culture clashes are not viewed as equally likely with all immigrant populations, and specific groups have specific concerns or fears attached to them. While long-term trends may follow the same pattern, how long to expect for a change to occur may vary, due to these issues. In other words, in order to be accepted, the hurdles may be higher for some immigrant groups.

In this paper I distinguish between three immigrant groups, chosen as a way to contrast three very different forms of immigration, with different perceptions attached. Western European immigrants are culturally similar and are generally not viewed with much concern. In contrast, Eastern European immigrants came recently to the UK, have been a great source of low-skilled labor in the country, and are less accepted and assimilated. Immigrants from Muslim countries were chosen as the third group because they particularly are viewed with suspicion in the UK. A 2017 survey in the UK found that 52 percent of respondents agreed that “Islam poses a serious threat to Western civilisation,” 42 percent were more suspicious of Muslims as a result of recent terror attacks, and only 10 percent believed that Muslims were similar to themselves (HOPE not Hate, n.d.).

Comparing different immigrant groups is important both because of how they are perceived, and how likely contact may be. That likelihood is further impacted by personality. How open we are, how extraverted we are, how friendly we are, all of these things and more may steer us either towards or away from meeting and forming friendships with immigrants in our communities. The same traits may also drive our perceptions of immigrants in the absence of contact. As a result, as immigration numbers increase, the role of personality may also increase.

Personality and Immigration Attitudes

Personality is associated with political attitudes generally (Gerber et al., 2011; Mondak, 2010; Mondak et al., 2010), as well as immigration attitudes (e.g. Ackermann et al., 2018a; Dinesen et al., 2016; Gallego & Pardos-Prado, 2014), and levels of prejudice (Akrami et al., 2011; Sibley & Duckitt, 2008). Personality can be thought of as our general patterns of thinking, behaving, and feeling, and can be seen as a precursor to political attitudes (Block & Block, 2006; Mondak, 2010). The impact of local levels of immigration provides an example where personality is especially important to study, as the behavioral patterns associated with different personalities will likely impact the attitudinal effects of immigration. In the field of personality research, the Big Five is currently the major measurement construct for personality, used in the majority of psychological studies using personality (John et al., 2008). This measure is composed of five traits: openness (or openness to experience), conscientiousness, extraversion, agreeableness and neuroticism (also called emotional stability). These traits are highly heritable (Bouchard, 2004) and quite stable throughout one's life, though they do continuously change as one ages (Caspi et al., 2005).

As the concentration of immigrants in one's local area increases, it is likely that one's personality will affect how one responds to that increase. In other words, there should be an interaction. There are two main ways this could occur. The first way is through threat perceptions. Johnston et al. (2015) found that levels of authoritarianism predicted perceived threats in response to ethnic change and, similarly, Karreth et al. (2015, p. 1) found that increasing diversity is "associated with negative attitudes towards, immigrants, but only among natives on the political right." This dynamic seems likely to occur with personality as well. The second way is through behavioral mediation. Personality may impact behavioral patterns which then subsequently affect immigration attitudes. This will most likely be through contact. Our behavioral choices will make us more or less likely to come into contact with immigrants, and some of those choices will be driven by our personalities. Once we are in contact with immigrants, some of us will be more or less likely to befriend them, again, due to our personalities, and not necessarily our pre-existing attitudes towards immigration.

Openness describes how curious people are and how open they are to new experiences. A high level of openness has been the most consistent Big Five predictor of left-wing views overall (Gerber et al., 2011; Jost et al., 2009). Beyond that, it has been found to predict less-prejudicial views (Akrami et al., 2011; Sibley & Duckitt, 2008) as well as been associated with more tolerant and permissive views towards immigration (Ackermann & Ackermann, 2015; Ackermann et al., 2018a; Dinesen et al., 2016; Freitag & Rapp, 2015; Gallego & Pardos-Prado,

2014; Ziller & Berning, 2019). Relatedly, it has been found to predict lower voting levels for a right-wing populist party (Ackermann et al., 2018b). Some evidence indicates openness predicts a larger friendship network (Harris & Vazire, 2016), and it has also been found linked to more new contacts as a percent of one's network (Zhu et al., 2013), and more critically here, more interethnic friendships (Jackson & Poulsen, 2005; Laakasuo et al., 2017), as well as a more positive interpretation of those experiences (Jackson & Poulsen, 2005). It has also been found to interact with immigrant contact and subjective neighborhood diversity, increasing the effect of openness in those conditions (Danckert et al., 2017). We can be confident that openness will predict more positive views towards immigration. Although this has not been consistently found, it is reasonable to expect that as immigration levels rise, the effect of openness on attitudes may increase, as high-open individuals may be more likely to have contact with immigrants, and have those experiences be perceived as more positive.

Conscientiousness describes how rule-following and organized people are. A high level of conscientiousness is the most consistent Big Five predictor of right-wing views overall (Gerber et al., 2011; Jost et al., 2009). As it is associated with upholding tradition and national unity, it is not a big surprise that it has also been found associated with anti-immigration views (Ackermann & Ackermann, 2015; Ackermann et al., 2018a; Dinesen et al., 2016; Gallego & Pardos-Prado, 2014; Ziller & Berning, 2019) as well as voting for a right-wing populist party (Ackermann et al., 2018b). It has been found to weakly predict prejudicial views, however that depends on the region of the world (Sibley & Duckitt, 2008). As conscientiousness is generally not related to friendship or network size (Harris & Vazire, 2016; Selden & Goodie, 2018), it is unlikely that it will play a large role in contact patterns with immigrants. However, two studies from Switzerland found that perceived neighborhood diversity moderated the effect of conscientiousness on immigration attitudes (Ackermann & Ackermann, 2015; Ackermann et al., 2018a). Conscientiousness only predicted hostile attitudes in *less* diverse areas. In *more* diverse areas the negative association disappeared. This is the opposite of what they predicted, as they predicted more diverse areas should be seen as more threatening to very conscientious individuals. It is reasonable that, for this trait, interactions with immigration levels could go in either direction. Those predisposed to hostility could become more hostile. Or, as areas become more diverse, they could find their fears and concerns mollified, through contact or otherwise. Both patterns may occur, but to different individuals. This may result, on the population level, with the effects essentially canceling each other out, or with the dominant effect depending on local conditions. As a result, there is no clear prediction for interactions involving this trait.

Extraversion describes how socially outgoing an individual is. Research results regarding its impacts on general political attitudes are mixed, though there are indications it may weakly correlate with right-wing views (Gerber et al., 2011). It has not been found associated with prejudice (Sibley & Duckitt, 2008). However, it has been associated with anti-immigrant views (Freitag & Rapp, 2015) and voting for a right-wing populist party (Ackermann et al., 2018b), although the majority of studies in this area did not find a significant effect related to immigration attitudes. On the other hand, extraversion is found to predict larger friendship and contact networks (Harris & Vazire, 2016; Selden & Goodie, 2018; Zhu et al., 2013) and has been found to predict lower intergroup anxiety, through higher cross-group contact levels (Turner et al., 2014). Thus, while it seems unlikely that, on its own, extraversion will have a large impact on immigration attitudes, it is reasonable to expect that to change as immigration levels increase. In other words, extraversion may not have a strong intrinsic relationship with immigration attitudes, but through its role in contact networks and friendships, it may begin to predict positive attitudes as immigrant concentrations become larger. Therefore, it is reasonable to expect an interaction between extraversion and immigration levels.

Agreeableness describes how friendly or empathetic an individual is. Although it is not a strong predictor of left- or right-wing views overall (e.g. Gerber et al., 2011; Mondak, 2010), it has been found to be associated with lower levels of prejudice (Akrami et al., 2011; Sibley & Duckitt, 2008), more supportive views towards immigration (Ackermann & Ackermann, 2015; Ackermann et al., 2018a; Dinesen et al., 2016; Freitag & Rapp, 2015; Gallego & Pardos-Prado, 2014; Ziller & Berning, 2019) and less support to a right-wing populist party (Ackermann et al., 2018b). Agreeable individuals also are found to have larger networks (Harris & Vazire, 2016; Selden & Goodie, 2018; Zhu et al., 2013), lower intergroup anxiety (Turner et al., 2014), and more intergroup contact, with a more positive interpretation of those experiences (Jackson & Poulsen, 2005). The positive association between agreeableness and immigration attitudes increased, according to one study, in more diverse neighborhoods (Ackermann et al., 2018a). This trait is likely to be a strong predictor of immigration attitudes, and also is likely to have a stronger effect as immigration increases, through increased contact levels with immigrants and/or a differential response to rising levels, with high-agreeable individuals being less threatened than low-agreeable ones.

Neuroticism indicates how sensitive to negative emotions one is. Overall, it is not as strong a predictor of overall left- or right-wing views as openness or conscientiousness, but higher levels of neuroticism tend to predict left-wing economic views (Gerber et al., 2011), and the trait been associated with support for parties which provide “shelter against material or cultural challenges” (Schoen & Schumann, 2007, p. 492). Like with conscientiousness, it has also been found to weakly correlate with prejudicial views, but only in some regions (Sibley & Duckitt, 2008). It has also been found in at least one study to predict anti-immigration attitudes (Gallego & Pardos-Prado, 2014). Neuroticism does not seem to have much bearing on the size of one’s network, but it does predict instability in current friendships (Harris & Vazire, 2016) and may hinder friendship formation (Selden & Goodie, 2018). It is likely to have an association with anti-immigrant attitudes, however that may depend on context, as with its associations with prejudice. There is no clear prediction of an interaction with this trait with rising immigration levels. As with conscientiousness, it could be that increased immigration levels will exaggerate its effect, due to differing threat perceptions at the different ends of the traits, or it could diminish the concerns held by high-neuroticism individuals through normal levels of contact with immigrants over time.

Interactions between traits and immigration levels are likely to occur either through differential contact patterns, or different interpretations of experiences. Both are likely to occur to some degree. We can be more confident that, to the extent a trait predicts contact, higher immigration levels should increase the predictive power of the trait, as the more contact-prone side of the trait pulls farther away from the more reticent side. This sort of an interaction is most likely to occur for openness, extraversion, and agreeableness. Interactions dependent on the interpretation of experiences are harder to predict. Here it is reasonable to expect interactions in two directions. Those who are “naturally” more hostile to immigration may become even more hostile in the presence of immigrants, enlarging the effect of the trait. On the other hand, over time, as they get used to immigrants and have more contact with them (even if they did not seek it out), the perceived threat may lower, bringing the two sides of the trait closer together. This may be what occurred in Ackermann and Ackermann (2015) and Ackermann et al. (2018a). It is worth considering that this can also run in the opposite direction. Perhaps those less prone towards hostility will have negative experiences, and the trait will lose predictive power as both sides become more similarly hostile.

In this paper I both distinguish between three immigrant groups. It is reasonable to expect that there will be overall more hostility towards more culturally distant groups. That said, it is not straightforward to predict how this will impact interactions. Groups that provoke less hostility may also be most likely to come into contact with the respondents, and the experiences may be closer and more positive. On the other hand, there may be less room for the experiences to have an effect, as attitudes towards those groups may be relatively positive to begin with. It may be the groups which provoke the most concern where contact could have the largest effect. Similarly, as a more threatening group increases in numbers, it is reasonable to assume that, without contact, this will increase the predictive power of personality traits, as the poles of the trait have a more and more disparate response. As a result of these complexities, this paper does not make any predictions about differences between group-personality interactions. Ideally though, what should be seen are consistent patterns.

Research design

In order to investigate these issues, I combined several data sources. For data on political attitudes, as well as personality, I used Wave 1 of the internet panel of the British Election Study (Fieldhouse et al., 2014). This dataset contains information about the respondents' local authority, which allowed me to merge it with data concerning these local authorities. Wave 1 was used as it was closest in time to the latest census, which provides the most accurate data on immigrant distributions. Immigration and population data come from the 2001 and 2011 censuses for England and Wales, and for Scotland (National Records of Scotland, 2020a, 2020b; Office for National Statistics, 2020a, 2020b). From the censuses, I used population totals, and immigrant totals for three groups of immigrants. Western European immigrants are those who come from countries which were members of the EU prior to 2001, Eastern European immigrants come from countries which joined the EU between 2001 and 2011, and immigrants from predominantly Muslim countries are those who came from the Middle East, North Africa, Pakistan and Bangladesh¹. Additionally, to control for the effects of the local economy, I used UK government estimates of unemployment for these local areas averaged over the year 2014 (Office for National Statistics, 2019).

¹ There might be slight discrepancies in which countries are included in the Eastern European category between 2001 and 2011. This is unlikely to impact results in any large way – and the main results are solely for the 2011 percentages.

Table 1: Correlation Matrix of Immigrant Population Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Western European Percent	1.00					
(2) Eastern European Percent	0.53	1.00				
(3) Muslim Percent	0.45	0.49	1.00			
(4) Western European Change	0.85	0.48	0.48	1.00		
(5) Eastern European Change	0.32	0.93	0.39	0.30	1.00	
(6) Muslim Change	0.04	0.20	0.63	0.02	0.27	1.00

Note: Change represents percentage point change from 2001 to 2011. Correlations between percent and change measures for the same immigrant group are bolded.

I used immigration data from 2001 in order to calculate the percentage point changes in each local authority for each immigrant group. This is because there may be a different effect of immigration change as there is for total immigrant shares (see, e.g. Kaufmann, 2017). However, as can be seen in Table 1, the correlations between the change variables and the percent variables for each group are quite high, indicating very similar relationships with the variables of interest. Indeed, that was what was found. Therefore, only the analysis for the immigration percent variables will be shown below. See the appendix for the results for the immigration change variables.

Table 2 shows summary statistics for the different immigrant measures. As can be seen, the mean values for all measures are low, between 1 and 2 percent. However, the maximum values are generally quite high, reaching up to 16 percent, indicating a long tail in values. As this study focuses on how individuals of the majority population respond to living in areas with varying levels of non-UK born residents, I am restricting the sample to only those who are UK citizens and who answered that their ethnicity was “White, British”.

Table 2: Summary Statistics for Immigrant Population Variables

Variables	Mean	SD	Min	Max
Western European Percent	1.44	1.27	0.33	14.52
Eastern European Percent	1.75	1.47	0.20	10.58
Muslim Percent	1.44	2.05	0.06	17.01

Note: Observations omitted when NAs present for key variables in base models. N = 18,301.

The outcome variable I am using, *Immigration Attitudes* is the mean of the *Economic Effects* and *Cultural Effects* variables. These questions ask the respondents: “Do you think immigration is good or bad for Britain’s economy?” and “And do you think that immigration undermines or enriches Britain’s cultural life?”, respectively. While the sources of immigration concern may vary, it seems that the respondents largely see the effects as being the same or highly similar, as these two variables are highly correlated ($r = 0.80$).

Measures of personality are based on responses to the Ten-Item Personality Inventory (TIPI) (Gosling et al., 2003). Correlations indicate the traits are not highly correlated with each other. The highest correlation is between conscientiousness and neuroticism at $r = -0.34$. The

correlation between the two most politically relevant traits, openness and conscientiousness is low ($r = 0.08$). None of these correlations are therefore perceived to be problematic for the analysis.

Demographic controls are used in the analysis: sex, age, a measure of education, and personal income. Possible mediators are also used in the analysis. This includes self-reported left-right placement is used, as well as dummy variables for the major political parties. Local area-level covariates were also used, specifically 2011 population size and the 2014 unemployment level. The analysis was conducted using OLS multilevel regressions, with random intercepts varying by local area. To compare effect sizes, all independent variables have been min-max transformed so that 0 represents the lowest value and 1 the highest. In order to make the results more comprehensible, predicted values are plotted to visualize the important relationships.

Results.

The major results are summarized in Table 3. Model 1 excludes political covariates, while Model 2 includes them. In terms of demographic control variables, some findings should be noted. First, age is only found to predict hostility towards immigration once political covariates are included in the model. This implies that, for this dataset, the political covariates are acting together as a negative confounder for the relationship between age and immigration attitudes. As has been found previously, both higher levels of education and income were found to predict less hostile immigration attitudes, with education having a stronger effect. These effects persist, slightly weakened, after the inclusion of political covariates. Additionally, in all models, men were predicted to be slightly less hostile to immigration.

Local area level variables are also noteworthy, if predictable. A greater population predicts less hostile attitudes, while higher unemployment levels predict more hostile attitudes, though only once political attitudes are controlled for.

All personality traits were found to predict immigration attitudes, and in precisely the ways expected. The strongest effects were with openness and conscientiousness. We find here that agreeableness predicts support for immigration, while neuroticism hostility, as expected. However, the effect of agreeableness becomes insignificant when political variables are included in the models. Extraversion is found to predict slight hostility towards immigration, though that too becomes insignificant in the presence of political covariates. Aside from neuroticism, the effect sizes of all personality variables shrink in the presence of these party and political covariates. This indicates part of their effects may be mediated by ideology and party preference. That neuroticism does not have this effect indicates that its relationships with immigration attitudes may run counter to its relationships with left-right placement or party preference.

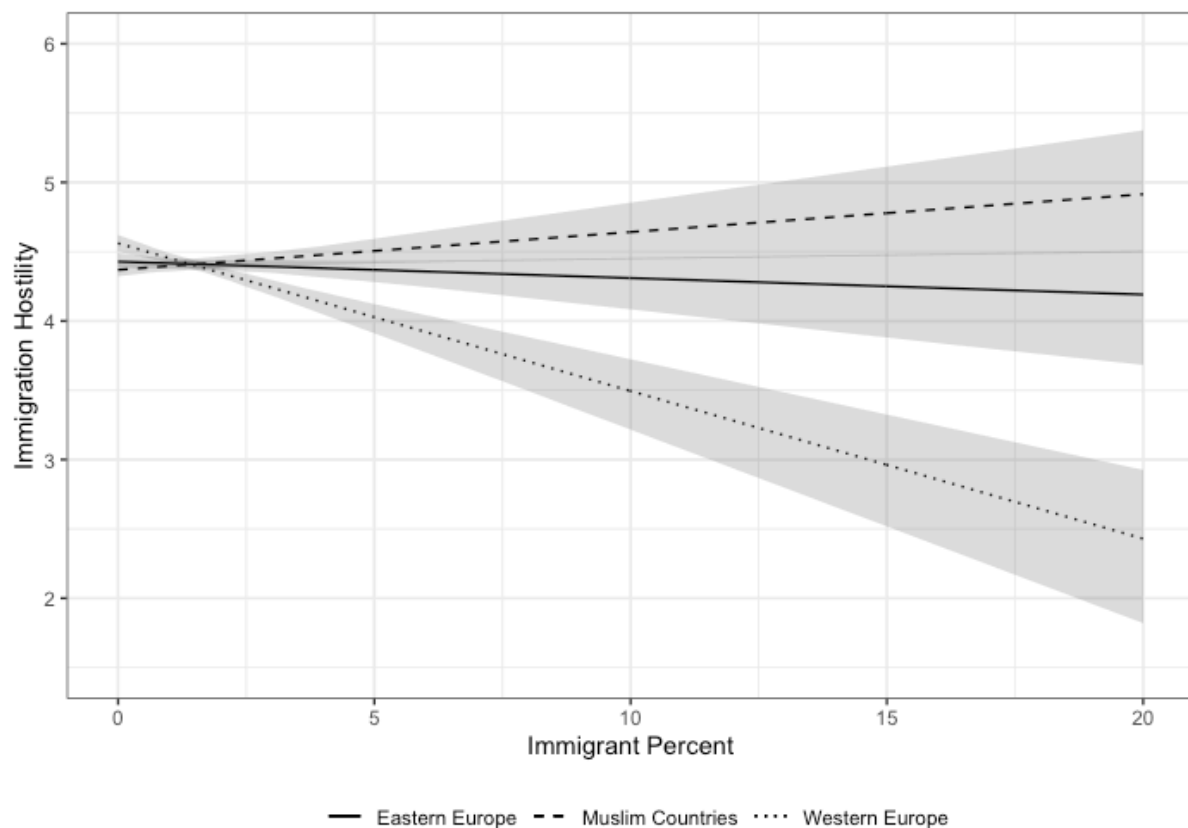
Table 3: Linear Mixed Models

	Model 1	Model 2
Openness	-0.996***	-0.590***
Conscientiousness	0.946***	0.661***
Extraversion	0.166***	-0.017
Agreeableness	-0.357***	-0.046
Neuroticism	0.369***	0.417***
Male	-0.126***	-0.095***
Age	0.006	0.152**
Education	-1.505***	-1.100***
Income	-0.265***	-0.317***
Left-Right		2.259***
Conservative		0.007
Labour		-0.185***
Libdem		-0.623***
UKIP		1.048***
Green		-0.503***
Population	-0.541***	-0.375***
Unemployment	-0.070	0.239**
Western European Percent	-1.848***	-1.513***
Eastern European Percent	-0.042	-0.123
Muslim Immigrant Percent	0.661***	0.462***
Observations	18,301	15,431
Log Likelihood	-35,553.670	-28,613.740
Akaike Inf. Crit.	71,274.180	57,449.310

Note: *p<0.1; **p<0.05; ***p<0.01. All continuous IVs standardized to be on 0 - 1, min-max scale. Higher values in the dependent variable indicate greater hostility.

The general finding which emerges from the immigration measures is that Western European immigrant presence predicts less hostility towards immigration, Muslim-country immigrant presence predicts more hostility, and Eastern European immigrant presence shows no significant relationship. Figure 1 shows predicted levels of hostility depending on percent of each immigrant group.

Figure 1: Predicted Immigration Attitude Levels by Group Population Share



Note: Predicted values estimated from multilevel linear model. Specifically, Model 2, presented above in Table 3. Immigration attitude scale runs from 1 to 7. Values above 4 represent hostility, while values below 4 represent support.

This finding supports the expectation that white British citizens react differently to different groups of immigrants, with more culturally distant groups provoking more hostile responses. This is important nuance. When predicting the effects of neighborhood diversity on immigration attitudes, simply looking at the total number of immigrants is likely to be misleading. It is essential to disentangle the groups and measure them separately, in order to understand their effects.

In order to establish whether personality traits moderate the effect of immigrant presence, or similarly, that immigrant presence moderated the effect of personality traits, I added interaction effects to the models presented in Table 3. I re-ran both of the models with an individual interaction between one of the personality traits and one of the immigrant group variables. Thus, for each personality trait, six separate models were constructed, each with one interaction. The purpose of this was to look for consistent patterns, both in terms of significance, as well as direction of effect. There could be a difference in how individuals respond to the different immigrant groups, however, to trust any differences found in immigrant group interactions, they should form a sensible pattern.

Table 4: Interactions

	Open.	Consc.	Extra.	Agree.	Neuro.
<u>Without Political Covariates</u>					
Western Europe %	-1.41*	0.91	-0.80	0.67	0.07
Eastern Europe %	-0.98*	-0.33	-1.11***	0.40	-0.39
Muslim %	-0.87	-0.13	-0.99**	0.36	0.13
<u>With Political Covariates</u>					
Western Europe %	-0.40	0.76	-1.33**	0.45	0.03
Eastern Europe %	-1.05**	-0.19	-1.15***	0.20	-0.37
Muslim %	-0.75	-0.05	-1.18***	0.47	0.12

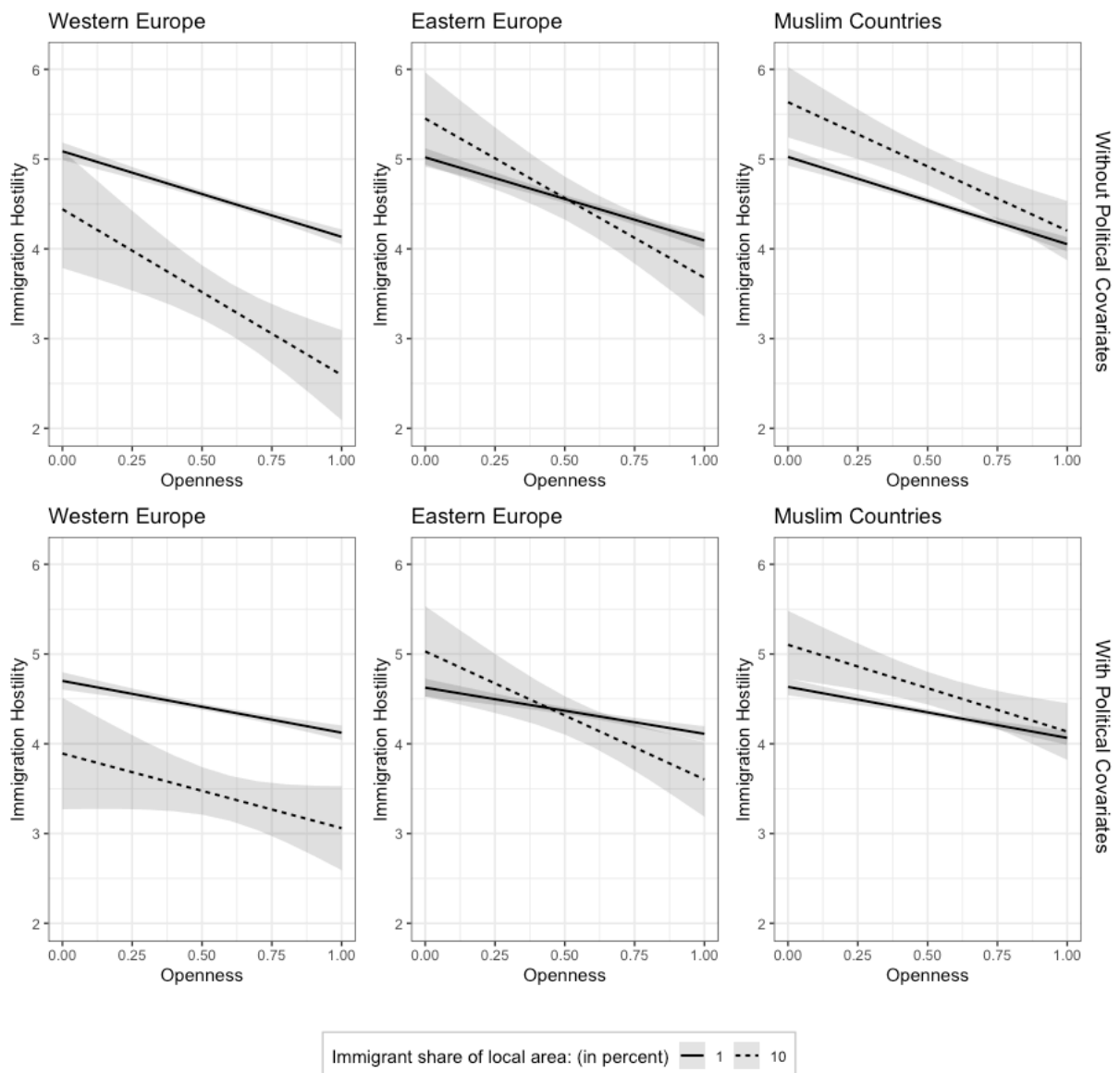
Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All continuous IVs standardized to be on 0 - 1, min-max scale. All are multilevel linear models, including other covariates as seen in Table 3.

Table 4 shows the results of these interactions. First it is important to note what we do not find. For conscientiousness, agreeableness and neuroticism, even at a generous $p < 0.1$ standard, there are no significant results. The two traits which do show evidence of interaction effects are openness and extraversion. Openness and extraversion were highlighted as strong contenders for interactions. Openness is a likely predictor for both its consistent connection to political attitudes more generally, as well as to friendship networks and to inter-ethnic friendships. No specific prediction was made for a main effect of extraversion, and indeed was not found to have such an effect, once political covariates were included in the model. However, given its role in friendship networks, it was reasonable to expect that extraversion might be implicated in a contact effect, especially at higher immigration levels. The lack of a main effect would therefore be likely due to the fact that average immigration levels are quite low.

Figure 2 shows us predicted levels of immigration attitudes at 1% and 10% immigrant shares for the three groups, by levels of openness, both with and without political covariates. For all three immigrant groups, we see that at higher immigrant concentrations, the slope increases, showing that there is a larger differentiation between those low and high in openness. This effect is quite similar for interactions with all immigrant groups. This indicates there is no major difference in the effect pattern, based on immigrant group. What differs between the groups is the overall level of support. For all levels of openness, higher levels of Western European immigrants are associated with more supportive attitudes overall. However, the high-open individuals show a greater increase in supportive attitudes than the low-open individuals. As we move to Eastern European and Muslim-country immigrants, we see the 10% line is shifted upwards. In the Eastern European condition, low-open individuals become more hostile to immigration at the 10% level, while high-open individuals become more supportive. In the Muslim origin condition, we see all groups are more hostile to immigration at the 10% level, however low-open individuals have a large increase in hostility, while high-open individuals show little increase.

Finally, we see that including political covariates changes the story subtly for interactions with Western European immigrant shares. Here we see that without political covariates, the interaction is most dramatic with this immigrant group, however that changes with the inclusion of political variables. This indicates that the interaction is partly driven by mediation effects on the part of other political attitudes.

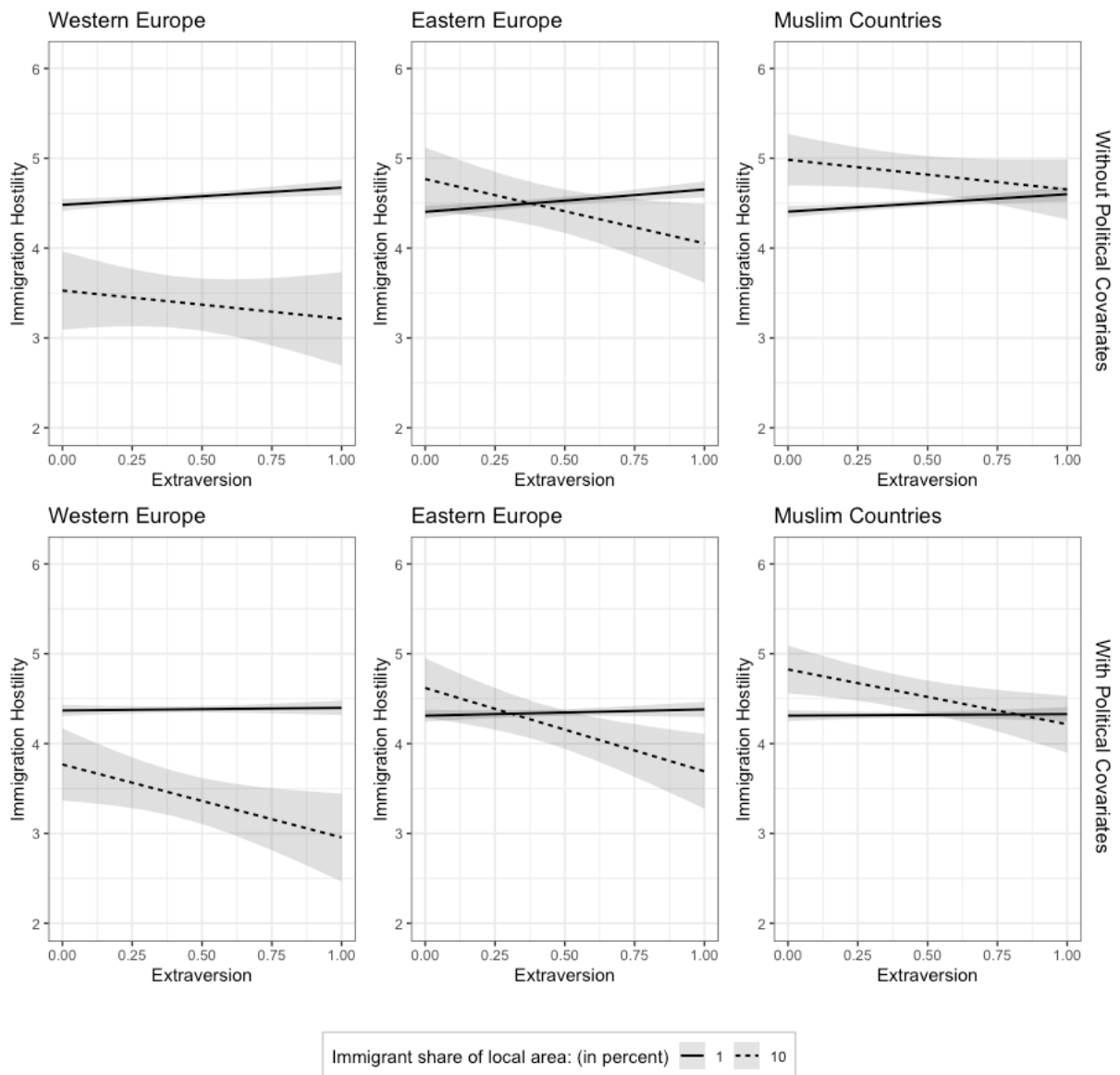
Figure 2: Predicted Immigration Attitudes Based on Openness and Immigrant Interactions



Note: X-axis represents increase from lowest value of openness to highest. Solid lines represent 1% share of population by immigrant group in question, dashed lines 10%. Shaded regions represent 95% confidence intervals. Predictions made from multilevel linear models, including all other covariates. Immigration attitude scale runs from 1 to 7. Values above 4 represent hostility, while values below 4 represent support.

Moving on to extraversion in Figure 3, we see a different, and even stronger pattern. At low immigrant levels, extraversion is weakly correlated with immigration hostility. However, that pattern reverses and strengthens in the presence of large immigrant populations.

Figure 3: Predicted Immigration Hostility Based on Extraversion and Immigrant Interactions



Note: X-axis represents increase from lowest value of extraversion to highest. Solid lines represent 1% share of population by immigrant group in question, dashed lines 10%. Shaded regions represent 95% confidence intervals. Predictions made from multilevel linear models, including all other covariates. Immigration attitude scale runs from 1 to 7. Values above 4 represent hostility, while values below 4 represent support.

At higher immigrant concentrations we see that high levels of extraversion predict lower hostility levels. This is the case for all immigrant groups, both with and without political covariates. This would be expected, given the general lack of association between extraversion and general political attitudes. Once again we see the same pattern present in Figure 2 that, due to the disparate effects of each immigrant group, the line in the 10% condition shifts upwards as the group becomes more culturally distant. With a high percentage of Western European immigrants, we see that both high and low levels of extraversion predict greater levels of support for immigration, but this effect is magnified for more extraverted individuals. With high levels of Eastern European immigrants we see that introverted individuals become slightly

more hostile towards immigration, while extraverted individuals become slightly more supportive. And with high levels of immigrants from Muslim countries, we find that introverted individuals are more hostile, but no real change among extraverted individuals.

These findings with extraversion, like with openness, may point to an unmeasured contact effect. Despite not having strong connections either to general political attitudes, or to immigration attitudes generally, we see here that at higher immigrant concentrations, extraversion becomes very relevant. This could indicate that extraverted individuals in these situations are more likely to have contact with immigrants, and this, according to contact theory, leads to more supportive attitudes towards immigration. This also points to a context dependency for this trait. Its major effect does not merely change in the presence of higher immigration levels, it may only really emerge under those conditions.

Discussion

Rising immigration levels could provoke two different responses. Either individuals could become more positive towards immigration, or more negative. And indeed, both phenomena were found here, for different groups of immigrants. High levels of Western European immigrants were associated with support for immigration, Eastern European immigrants had a neutral effect, while Muslim presence was associated with slight hostility. This highlights the importance of avoiding broad conclusions about the effects of increasing diversity.

This study also confirmed the important role of personality traits in predicting immigration attitudes, even when controlling for explicit measures of political preference and affiliation. Finally, this research showed that personality, specifically openness and extraversion, moderated the effect of immigrant presence on immigration attitudes. This demonstrates that whether someone responds positively or negatively to local immigration will depend both on who they are and the immigrant group in question.

However, these interactions should be interpreted with caution. They followed a consistent pattern, but some specific coefficients were statistically insignificant. Some of the effect of openness, moreover, seems mediated by other political attitudes and affiliations. As a result, it is unclear exactly what is driving the interaction effects for openness. The strong relationship between extraversion and immigration attitudes only emerges at higher immigrant levels, however mean immigrant levels in the study were low, meaning this association is based on limited data points. Both traits were identified as being contenders for predicting increased contact with immigrants, providing a clear explanation for these interactions, but contact was not measured, which is the main limitation of this study. The interactions for extraversion seem to clearly point in the direction of a contact-driven relationship, however for openness, the interaction may also be due to other factors, such as threat sensitivity. Future research, therefore, which more carefully measures contact can greatly help us to understand how much of these interactions are due to these competing explanations.

The broad personality findings here are in accordance with existing research about the connections between the various traits and attitudes towards immigration and prejudice (e.g.

Ackermann et al., 2018a; Akrami et al., 2011; Dinesen et al., 2016; Gallego & Pardos-Prado, 2014; Sibley & Duckitt, 2008). However, in previous immigration-personality studies, openness and conscientiousness were not consistently highlighted as the most important traits, whereas here they were. This is more in line with the general findings about personality and political ideology, which has found those two traits to be of the greatest importance (Gerber et al., 2011; Mondak et al., 2010; Jost et al., 2009). Despite the differences with other studies, it should be noted that, in this sample, the effect sizes for those two traits are nearly as large as for education, which has been considered a major predictor of immigration attitudes (Hainmueller & Hopkins, 2014). This further indicates the importance of personality to immigration attitudes. These differences in which traits are found to be predictors may have to do with study methodology as well as local context. Both conscientiousness and neuroticism, for instance, were found to predict prejudice only in certain regions (Sibley & Duckitt, 2008). Personality may relate to immigration attitudes in a number of ways, and although the findings may at times diverge, the strength of these relationships indicates they deserve attention. Future studies can help us to understand better when certain traits are more relevant to immigration attitudes, and why these differences exist between different contexts.

Previous studies have found interactions between personality traits and immigration levels or outgroup contact (Ackermann & Ackermann, 2015; Ackermann et al., 2018a; Danckert et al., 2017; Turner et al., 2014), however they do not precisely match what was found here, although they do not conflict with the findings here. Again, the differences could be due to methodology or local context. Notably, Ackermann et al., (2018a) and Ackermann and Ackermann (2015) found that the effect of conscientiousness disappeared in areas with higher diversity. That finding indicates that increasing levels of immigration can reduce the differences in effect between the two ends of a trait, a finding not found with other traits or in other studies. More research should be done to understand when that phenomenon is likely to occur, and moreover, if it is occurring through the more hostile end becoming more tolerant, or the more tolerant end becoming more hostile. This study found the presence of different immigrant groups are associated with differing attitudes towards immigration. However, it is notable that the interaction patterns were quite similar regardless of group. This indicates that the increased perceived threat associated with the different groups did not significantly alter the general moderation effect. That may have to do with the lack of sensitivity of the measures, or it could indicate that this effect is similar for all outgroups, just with differing starting points.

Additionally, as with contact studies generally, longitudinal data would be very useful for understanding how opinions change over time. With this study, we do not know how long the respondents have been living in their listed local areas, or where they moved from. We do not know how much these findings relate to self-sorting and not contact directly. This may be especially true for the findings relating to Western European immigrants, where it is unlikely there were strong prejudices to begin with.

What effect do increasing levels of immigration have on political attitudes? It is a simple question, but the answer may not be so straightforward. There is no single effect. This study finds strong evidence that immigration origin greatly influences how likely it is to provoke positive or negative responses in the British population. That likelihood will also depend on the individual. This study also finds strong evidence for the importance of personality. Not only is it a strong predictor of immigration attitudes, but as local immigration levels increase, the effects of certain traits may become even more prominent. In other words, at higher immigration levels, one's disposition becomes even more of a determining factor.

Acknowledgments

This research would not have been possible without data from the British Election Study, which was supported by Economic and Social Research Council.

Declaration of Interest

There are no conflicts of interest to declare.

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Appendix

Table A1: Summary Statistics for Immigrant Population Change Variables

Variables	Mean	SD	Min	Max
Western European Change	0.26	0.45	-0.44	3.40
Eastern European Change	1.39	1.18	-1.30	10.34
Muslim Change	0.37	0.70	-3.40	4.07

Note: Change represents percentage point change from 2001 to 2011. Observations omitted when NAs present for key variables in base models. N = 18,301.

Table A2: Linear Mixed Models for Change Variables

	Model 1	Model 2
Openness	-0.993***	-0.588***
Conscientiousness	0.947***	0.664***
Extraversion	0.167***	-0.017
Agreeableness	-0.358***	-0.047
Neuroticism	0.371***	0.419***
Male	-0.125***	-0.093***
Age	0.003	0.150**
Education	-1.505***	-1.101***
Income	-0.271***	-0.324***
Left-Right		2.260***
Conservative		0.003
Labour		-0.187***
Libdem		-0.627***
UKIP		1.044***
Green		-0.506***
Population	-0.486***	-0.352**
Unemployment	0.140	0.404***
W. European Change	-1.211***	-0.975***
E. European Change	0.276	0.007
Muslim Immigrant Change	0.420*	0.342*
Observations	18,301	15,431
Log Likelihood	-35,554.420	-28,617.770
Akaike Inf. Crit.	71,275.690	57,457.350

Note: *p<0.1; **p<0.05; ***p<0.01. All continuous IVs standardized to be on 0 - 1, min-max scale. Higher values in the dependent variable indicate greater hostility.

Table A3: Interactions for Change Variables

	Open.	Consc.	Extra.	Agree.	Neuro.
	<u>Without Political Covariates</u>				
W. Europe Change	-1.51**	0.88	-0.84*	0.60	0.15
E. Europe Change	-0.89	-0.70	-1.38**	0.43	-0.59
Muslim Change	0.12	-0.07	-0.35	0.59	-0.21
	<u>With Political Covariates</u>				
W. Europe Change	-0.70	0.74	-1.23***	0.19	0.33
E. Europe Change	-1.26*	-0.39	-1.40**	0.19	-0.57
Muslim Change	-0.34	-0.16	-0.44	0.24	-0.24

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All continuous IVs standardized to be on 0 - 1, min-max scale. All are multilevel linear models, including other covariates as seen in Table A2.