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Cultural Discrimination and Behavioural Polarization

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Abstract

This paper analyses discrimination as a trigger for polarization. We distinguish between economic and social aspects of discrimination as well as between individual and regional level. Specifically, we culturally augment an economics of identity model, by explaining the choice of insider or outsider identity based on discrimination and using this choice as a predictor of individual and local degree of polarisation in cultural attitudes. Using data from the German Socio-Economic Panel (IAB- BAMF-SOEP refugee subsample) about Syrian, Iraqi, Afghan and Eretria refugees in 2016-2019, we employ a unique approach to quantifying the polarization of individual attitudes (i.e. the individual polarization). We find consistent evidence that on individual radicalization and polarization seem to be a culturally sensitive effect on individual level in terms of being associated with perceived experienced discrimination. Yet, on regional level these feelings seem to develop mostly in places that suffer from relative economic deprivation. Finally, a cultural entropy measure for the balance between the traditional and modern attitudes in a place seems to most successfully explain the average levels of polarisation of individuals in a locality.

Introduction

Discrimination is not only an event, it is a trigger of an emotional experience for the discriminated that leaves an emotional scar and evokes a behavioural response. Very few studies in economics have looked beyond the documentation of the event into analysing behavioural dimensions of the discrimination process itself (Loury 2003). Even fewer have looked at the behavioural consequences for the discriminated in line with the motivational belief and reasoning approach suggested by Benabou and Tirole (2016).

Meanwhile, an alarming tendency in modern socio-economic development is an intensive and multifaceted polarization of the general public with regard to their attitude to a multitude of topics: race, minority rights, gender equality, science, history, religion, climate change, and politics and with important consequences for economic development (see the literature review in Papyrakis and Mo 2014; Guriev and Papaioannidou 2022; Alesina and Tabellini 2022).

Political polarization has justly attracted a lot of scientific interest with important contributions (Alesina, Stancheva and Teso 2018; Alesina, Miano and Stancheva 2020; McCann 2018, 2019, 2020; Rodriguez-Pose 2018; Dorling 2018; Luca et al. 2023). Yet, the main take from this literature is that people polarize in their political views because they perceive reality differently. Since Becker (1957), the question why people perceive reality differently is either assumed to be a matter of exogenous preference (i.e. tastes) or largely remains unanswered.

The main aim of our study is to test the hypothesis that the subjective experience of discrimination triggers the polarization of individual behaviour mostly in particular socio-economic contexts of relative deprivation (economic context) and discrimination (cultural context). Theoretically, we suggest a culturally augmented identity economics model, using a Culture Based Development (CBD) rationale (following Tubadji 2012, 2013, 2023). Empirically, we use specifically collected survey data for refugees from Syria, Iraq, Afghanistan and Eretria in Germany. Neglecting the years of the COVID-19 pandemic, we employ data from the first 4 waves of GSOEP data which covers the early period of mass influx of refugees to Germany (2016 – 2019). Employing a unique measurement approach to individual polarization and aggregate (local) polarization process, we find substantial support for the association between discrimination and the polarization of individual behaviour. However, the negative feelings of radicalization and polarization seem to develop mostly when places embed people in a socio-economic context of relative deprivation. To look deeper into the mechanisms of impact from the socio-economic context, we employ the CBD notion of cultural entropy i.e. the balance between traditional and modern views in a place and that it is strongly associated with the local average level of individual polarisation.

This paper has the following structure. Section 2 presents the streams of literature on culture[1] and polarization that our approach brings together. Section 3 presents the main Culture Based

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[1] In this study, we consider the literature on race and ethnicity together under the broader umbrella of culture.

Development model and the underlying micro-mechanism suggested therein (i.e. that racial discrimination evokes subjective feelings of deprivation that lead to polarization of the individual's attitudes). Section 4 describes our data and outlines the estimation strategy. Section 5 presents the results. Section 6 concludes.

2   The CBD Behavioural Mechanism of Discrimination and Individual Polarization

We start here from the understanding that polarization of places is an aggregate behaviour that occurs as a function of emotional self-identification of people with opposing cultural narratives (i.e. as supporters of opposing narratives). Punt simply, polarization occurs in a place when people start self-identifying with opposing attitudes. We shall define opposing attitudes as an opposing degree of affect toward the same trigger or stimuli for reality – such as the democracy or female rights as a trigger/stimuli on which people to shape an attitude as a function of their affect to the notion.

Adopting the above framing of the process we want to model, we base our modelling on Akerlof and Kranton (2010) identity economics model. We argue that Identity Economics can be understood as hinging on the main premise that individuals will choose a different (often opposing) manner of satisficing behaviour depending on whether they perceive their identity as being an insider or an outsider of the group that dominates a place. We interpret this as follows: a person can perceive themselves as insider or outsider and this will lead to them self-identifying with an opposing attitude for the locality: a happy to collaborate (comply with) with the local insiders' cultural attitudes if one perceives one's identity as an insider and an unhappy attitude towards cooperating (unhappy to comply) with the local insiders' cultural attitudes if one perceives one's identity as an outsider.

Our main CBD hypothesis here is that the adoption of an insider or outsider self-identification is a choice of a cultural attitudinal type which is a function of the experienced discrimination locally. This identity type according to cultural attitudinal type defines as follows. If discriminated locally, a person refuses to comply with the attitudinal code of the cultural context i.e. self-identifies as an outsider. If not discriminated locally, a person accepts to comply with the attitudinal code of the local cultural context, i.e. self-identifies as an insider. We also make the testable assumption here, that economically deprived local context exposes an individual more often to discrimination and hence locally a higher polarization of attitudes will be observed in left behind places.

Our culturally augmented model for identity economics can be stated as the below Culture-Based Development (CBD) model of a human behavioural as a behaviour of self-distinction through a type of identity chosen in response to discrimination, where in CBD style there is an individual and context interaction that explains human behaviour (see Tubadji 2012, 2013, 2021). Specifically, we model

polarization of an individual's opinion as a function of objective and subjective experiences of discrimination, as stated in model (1):

$$IDENTITY\_TYPE_i = \alpha_1 + \beta_1\,Objective\_D_i + \beta_2\,Subjective\_D_i + \beta_3\,X_i + e_1 \,, \qquad (1.1)$$

$$POLARIZATION_j = \alpha_2 + \beta_4\,Objective\_D_{ij} + \beta_5\,IDENTITY\_TYPE_{ij} + \beta_6\,X_{ij} + e_2 \,, \qquad (1.2)$$

Where i stands for the individual, j is the place, α_1 and α_2 are the constants, IDENTITY_TYPE is the is the mode of attitude adopted by the individual, which can be measured on a scale varying between extremes in the spectrum of feelings (affect) on a particular topic (such as views on personal prospects at school and work, level of happiness, general views on democracy and religious leadership, female rights and other attitudes that drive human behaviour and choice), *POLARIZATION* is the local clustering of people with views on the extremes of the affect in their attitudes on a topic. The objective state of being discriminated is denoted as *Objective_D* and stands for the vector of variables that are used in a Mincer equation as standard explanatory variables in wage discrimination (following Barrow and Rouse 2005), as well as a control for granted legal status in Germany. *Objective_D* generally corresponds to Gary Becker's (1957) market discrimination and its related taste for discrimination. The *Subjective_D* component stands for self-reported feeling of having been discriminated; the *X* component represents a set of regional controls, describing the locality where the person is situated in Germany, such as place of living and degree of rurality of the place, unemployment rate and commuting or alternatively X is approximated with local development measure (such as GDP growth).

According to CBD and its notion of cultural entropy, the local development *X* is a function of the local attitudes towards complying (cultural heritage types of local attitudes denoted as CH) and adapting to new attitudes (living culture type of local attitudes denotes as LC). A local cultural milieu where the LC and CH are in full balance (i.e. when cultural entropy is highest and equal to 1) is a local cultural milieu that results in most efficiently flourishing local development X (see Tubadji 2024). We will test this assumption that the regional effect of *X* on polarisation is endogenous to the local cultural entropy balance between the CH and LC local cultural attitudes. This reasoning is in line and incremental to the work on endogenous identity economics in intersection with the interactional behaviour modelling (see Oxoby 2004; Eaton, Eswaran & Oxoby 2011; Horst, Kirman and Teschl 2006).

3   Data and estimation strategy

To operationalize model (1), we use data from the German Socio-Economic Panel V36 (IAB- BAMF-SOEP Survey of refugees) for the period 2016-2019 on the individual level, amounting to 5,742 individuals with 13,339 observations. The data is provided by German Institute for Economic Research (DIW Berlin) (see IAB-BAMF-SOEP 2021), which is publicly available on NUTS1 level, however we use it here at NUTS2 level

due to special granted access. This allows us augmenting the data with regional indicators on NUTS2 level and implementing multilevel analysis (see Appendix 1).

Our dataset contains information about refugees from Syria, Iraq, Afghanistan, and Eretria among other refugees, who have been interviewed for the first time in the survey between the period 2016 and 2018. The first questionnaire upon joining the panel contained varied questions about attitudes towards democracy, female rights and general happiness, among others. This questionnaire was used for people who joined the survey between 2016 and 2018. Return respondents in the second wave and onwards were asked annually about their general happiness only. The interviewees are at the age between 18 and 55 at their first interview.

Our main outcome of interest is the polarization of feelings with the respondent. We approximate this polarization of feelings in three ways: more directly with the dependent variable "happiness" (i.e. the attitude to one's current life conditions) and alternatively with the attitudes on two politically relevant topics (democracy and female rights). The happiness variable approximates utility in pure form in its most volatile on the spur of the moment state i.e. the utility that is polarizing is best approximated by this measure. The other variables serve to triangulate the results obtained with the happiness measure. See Appendix 1 for more details about each variable.

Our descriptive statistics hint at great spatial variation. Therefore, we explore the distribution of our main independent and dependent variables across space with more attention here. Figures 1 presents twoway scatter plots for the first year when the questions related to all our outcome variables were asked. Figures 2 & 3 show maps on aggregate local level, presenting the existing relationship (in levels and as regression coefficients with fixed effects) between discrimination and the level of our main outcome variables: happiness, pro-democratic views and pro-female right views.

{Figures 1, 2 & 3}

We see a very different spatial pattern emerging for every variable. Clearly, it seems that the refugees actually experience lower happiness in the Western part of Germany, which is more affluent than the Eastern part, in spite of the ultra-right party being mostly supported in the Eastern parts of the country. We assume that this must be because happiness is associated with relative economic deprivation. The pro-democratic views seem to have some spatial clustering to the West of the country. Most notably, female rights appear strongly supported in the Northern and Eastern part of the country rather than in the South Western.

Finally, we control for age, gender, education, parental education, labour market status and legal status in Germany (approved, in the process or denied) in model (1) as they are related to the Mincer equation. Further, we control for contextually relevant variables, such as Bundeslander, level of regional

unemployment rate, regional migrant rate, community size, sensitive questions answered, and third persons at interview.

Appendix 1 shows the precise definitions of all variables used in our analysis, with corresponding descriptive statistics. Summary of our World Value Survey augmentation of the IAB data with cultural variables and the quantification of local cultural entropy are available in Figure 4 and Appendix 2.

Estimation strategy

Testing PART 1

Our estimation strategy as *PART 1* focuses on testing part (1.1.) of model (1) and employs first the strengths of the data in terms of having various attitudes over which the refugees are observed to polarize. Next, we move towards methodological strengthening of our findings, using the fact that one of the attitudes-related variables, namely general happiness (life satisfaction), was collected in every wave of the survey, thus a short panel dataset is available. Finally, we offer some robustness checks based on a subset of the sample to reduce heterogeneity in the tested sample.

The main tested assumption of our CBD model (1) in the empirical PART 1 of our study is the assumption that insider identity is equivalent to feeling generally happy and satisfied with one's life in a locality resulting in positive affect and compliance in your attitude with the local cultural attitudes to any array of stimuli such as democracy, female rights etc. questions of attitude. Respectively, this is the same as saying that polarizing attitudes of self-identifying as an outsider are parallel to noncompliance with the local attitudes for democracy, female etc questions of attitude and coincide with feeling generally unhappy and dissatisfied with one's life locally. Put simply, we want to empirically crosscheck the assumption that what determines general unhappiness and life-dissatisfaction is in big part the most strongly associated explanatory factor for polarisation.

Hence, our first step entails using as alternative quantifications for polarizing attitudes the variables: attitudes to one's general happiness, attitude to democracy, attitude to female rights. Following model (1), we explain these alternative outcomes with the Mincer equation, augmented with information for the objectively granted legal status in Germany and the subjectively reported feeling of having been discriminated. The latter are not very strongly correlated so using them together does not create collinearity or endogeneity issues. The regressors include also regional dummies and control for rurality of the recipient locality. We conduct first regression using the level of the outcome variable; then we use three transformations of the dependent variable to capture polarization in a different manner.

In a second step, we move towards examining the dynamics of polarization over time, by exploiting the panel structure of the waves. We shall use the same outcome variable for polarization with regard to being in the extreme, but we will compare the behaviour of the individual in the beginning and

the respective subsequent period (t+1) of individuals' participation at the survey. With this approach we aim to explain the main drivers of the dynamic change in the polarization of behaviour over time, using the same set of explanatory variables and controls as in our above-described cross-sectional analysis.

We implement also two robustness checks. These robustness checks address the potential unwanted ethnic heterogeneity of the sample. We set to handle this potential source of bias by dividing the sample between only Syrian population sub-sample and others. We do this for two reasons: the Syrian group is the biggest group in the sample. The Syrian behaviour was always very different from the behaviour of the other two groups. Thus, we compare the behaviour of this sample to the behaviour of the other three ethnic groups (Afghan, Iraqi and Eritrean) pooled together (for explanatory power of the estimations with this last pooled dataset). Syrians were the main ethnic group seeking refuge due to the political change in their country of origin.

Testing PART 2

Our empirical PART 2 focuses on part (1.2) of model (1) and regards testing the relationship between people's attitudes and the embeddedness of people in a certain local context. The local context has clearly economic and cultural aspects and both of them may play a role for discrimination to be enacted. Gary Becker (1957) explains how actual inequality, segregation and discrimination are objectively three different entities. We claim here however that people are cognitively biased and cannot distinguish between them. Instead, their radicalization and polarization happen when they experience perceived feelings of discrimination, even if it falls in any other objective category. This claim is consistent with our findings from H01. Here we question in what element of the local context – the objective economic circumstances or the subjective cultural feelings about discrimination is this individual mechanism most active in. Previous research has provided strong evidence for the important contemporary cultural differences across the regions of Germany based on the traditional religion and economics distinction between Protestant and Catholics attitudinal predominance in a place (Chadi and Krapf 2015). We would like to further unpack the importance of this cultural milieu regional difference for the experience of discrimination. Cultural factors have been demonstrated to make a difference for the socio-economic mobility of migrants (Deutscher 2020). Hence, we have good reasons to expect impact of local cultural context on the socio-economic development (or lack of such due to discrimination) of the migrants in our survey.

To distinguish empirically between socio-economic context and cultural context we use for the socio-economic context the proxies local GDP growth and local unemployment rate to approximate economic context and we use the share of voting for ultra-right parties, the share of foreigners in a locality or the community size as proxies for the cultural embeddedness context (as all three can be expected to have social impact on discrimination sentiments due to either direct salient attitude to foreigners or due

to contact theory (Allport 1954), as previously explained). For cultural entropy we employ 30 different mono-dimensional cultural attitudes provided by the Word Value Survey WVS) on individual level, which we aggregate on average local level (NUTS2) for Germany and merge with our data based on place of living of the individual observed in our IAB dataset. We employ principal component factor analysis to obtain the CH and LC factors that represent the two parts of the complex entity culture and we employ a Shannon Entropy measure to estimate the balance between CH and LC in a locality (see Appendix 2 and Figure 4 for more details).

Empirically, we estimate linear multilevel, hierarchical models, where the first level is the individual observation and the second level is the nesteddness on NUTS2 level in Germany[2]. We explore whether the nesteddness on NUTS2 is statistically significant for human behaviour at all (this is the main test of our model part (1.2)). Additionally, we explain the regional nestedness alternatively with one of the proxies of socio-economic context or cultural context. This helps to explain what part of the regional nesteddness is associated with the economic context and what with the cultural context. We estimate these hierarchical model tests for explaining the level of feelings of refugees, approximated alternatively with one of the three attitudes in our datasets: life satisfaction (HAPPY), attitudes to democracy (ATTITUDES2DEMOCRACY) and attitudes to women rights (ATTITUDES2WOMEN).

We conduct Robustness check 3 which entails conducting likelihood-ratio tests for the regional intercept only and the importance of the information added when using the economic or cultural context variables, When the p-value of the test is smaller than 0.05, the context variables add important information in explaining the regional variation in human behaviour.

4 Empirical Results

Results PART 1

Impact of Discrimination on Alternative Measures for Polarization

Operationalizing our CBD model (1), we use three alternative dependent variables, happiness, pro-democratic and pro-female rights and the polarization with regard to these three topics as three alternative approximations of the behavioural response of the individual to perceived cultural discrimination.

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[2] According to the European Commission, NUTS2 level is the basic regions for the application of regional policies. NUTS2 regions usually have between 800,000 and 3 million inhabitants. In Germany, NUTS2 level corresponds to governmental regions known as Regierungsbezirke. This is the official definition of NUTS2 as provided by the EC. See: https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units/ and https://www.destatis.de/Europa/EN/Methods/Classifications/OverviewClassification_NUTS.html.

Results for general happiness and polarization on this topic are reported in Table 1:

{Table 1}

As seen from Table 1, our main explanatory factor – perceived cultural discrimination – behaves as expected by our CBD model (1). Namely, the less discrimination a person has felt, the happier they report themselves to be and the less likely they are to polarize in the negative spectrum, both in the broader or narrower definition of it.

An interesting additional insight about the dynamics is that the people who arrived in Germany as refugees before 2014 and after 2015 are reportedly happier than those who arrived during the big refugee wave of 2015. This is a very realistic pattern and nevertheless it does not disturb the main effect from discrimination.

We look next at pro-democratic attitudes and polarization on this topic. Results are reported in Table 2 as follows:

{Table 2}

Table 2 shows a fully consistent effect from discrimination on the level of support for pro-democratic values and the tendency towards polarization, especially to the negative spectrum. Namely, the less discriminated a person has felt, the more likely they are to support democratic values (here clearly the causality can be in both directions). However, more importantly, belonging to the negative extreme with regard to pro-democratic values is strongly associated with having felt discriminated.

Results for pro-female rights attitudes and polarization on this topic can be found in Table 3, below:

{Table 3}

Table 3 shows again a strong shielding effect of local cultural tolerance since less polarized attitude is individually adopted when less perceived cultural discrimination is experienced by the individual, here showcased with polarizing behaviour with regard to females' right to work. The less discriminated one is, the more likely one is to avoid polarization in the negative spectrum in both broad and narrower sense. With regard to the rest of the dependant variables, the results are consistent with the previous two tables. The specific differences here entail the importance of the male gender, which is clearly driving the negative views on female rights.

To sum up, these results can be generalized as a behavioural response towards polarization associated with the impact of cultural discrimination on the utility function of an individual. The effect is present in the general level of happiness, which is a classical utilitarian measure. The same set of variables

(and essentially the same mode) explain consistently the polarization on any other topic with political or social connotation (such as democratic views or female rights). We tried the same estimation for polarisation regarding religious leadership as well, and the results were consistent with the findings presented above.

Put in terms of our CBD model (1), PART 1 confirms that an outsider identity, i.e. more polarizing identity (in terms of the spread between one's own level of attitudes on a stimulus/topic in comparison to the local dominant cultural narrative about this stimulus/topic), is adopted by the individual when higher degree of perceived discrimination is experienced by this individual locally. This is confirmed both for general life-satisfaction measures of polarisation and specific mono-dimensional attitudes on various triggers/stimulus/topics such as democracy or female rights.

Dynamics of Polarization over Time – Random and Fixed Effects

At a second step we want to examine the dynamic effects of polarization over time. We first address this data using the standard fixed and random effects estimators contrasted to a pooled OLS with clustered errors. The results for our fixed and random effect estimations are contrasted to the pooled OLS results in Table 4 below.

{Table 4}

The outcome variable for the fixed and random effect specifications is a dummy variable corresponding to 1 when the person has become extremely unhappy. The main take from Table 4 is that discrimination seems to persistently dominate the process of polarization of individual happiness over time. Apparently, the CBD micro-mechanism of discrimination-driven polarization finds support with regard to refugees in Germany over 2016-2019. The explanatory variables behave in a similar way as in our cross-sections.

Improving German language proficiency and entering the labour market has a significant shielding effect for people and helps them transform from unhappy to happy state. To the contrary high qualified refugees who could not meet their labour market related aspirations tend to become unhappy. Similarly, granted recognized refugee status makes refugees happier.

{Table 5}

The main take from Table 5 is that the majority of respondents remain happy overtime. However, 5,4% of all respondents being happy in time t become unhappy in the following year whilst the majority of unhappy individuals in time t become happy in time t+1 (75.2%).

These results viewed together with our findings reported in Tables 4, can be understood as follows. Feelings of perceived relative deprivation (of being discriminated in a way) make people unhappier. Granting local status also makes refugees happier. But still over time some refugees get unhappier. This might because migrants' point of reference shifts from their home country to their destination country (see for example Nikolova and Graham 2015). Yet, it might be affected by the feeling of discrimination as our data suggests.

Robustness Check 1

To address the persistently found differences in the behaviour of the Syrian population, we want to cure the heterogeneity influence by dividing the sample into Syrian refugees and the rest of the refugees. As the Syrians are the biggest group among the surveyed people, this leads to two datasets with relatively comparable size. We then use the same estimation model (1) as discussed in the previous section, for the same set of three alternative topics for behavioural polarization. The results are presented in Table 6, 7, & 8 below.

{Table 6, 7 & 8}

The main take from the tables in Robustness check 1 is that the refugee groups behave relatively consistently. With regard to the main explanatory variable of interest, we see a very prominent association between lower cultural discrimination and higher happiness levels and higher pro-democratic sentiment. The effect dwindles only in the case of attitudes to women' working rights, and what matters for this attitude is the strong negative association between Muslim religious belonging and support for female rights and the positive shielding effect of education that increases the support for female working rights across all groups. We do not find any substantial basic differences between the behaviour of the Syrian and the Non-Syrian groups, except that some effects are more prominent for one group than in others, but the main economic interpretation of the results remains the same. Therefore, our results can be considered fairly stable and free from heterogeneity bias.

Robustness Check 2

A second set of robustness checks that we present below entails using additional topics over which polarizing behaviour emerged, namely: aspirations for continuing general university education or vocational or training and expectations for finding a job. In contrast to happiness and domains of values, the refugees have not reported a polarized feeling on objective educational or employment plans. Table 9 & 10 present the results with the use of these alternative dependent variables.

{Table 9 & 10}

Again, the results from the Tables 9 and 10 report a very consistent general picture. With respect to educational or employment plans cultural discrimination is found not to be a pronounced factor in general. However, the less educated and the poor German language speaking groups in our sample report both poorer education and employment related plans. Additionally, respondent's health situation and the age are core drivers for labour market related plans. And yet, the same drivers matter for all refugee groups in a similar way. We interpret these findings is in terms of perceived cultural discrimination being felt as a more important threat for one's survival when one's education or health conditions are able to provide only a weaker shielding effect on the job market and in social distinction per se.

Results PART 2

The estimation of multilevel models was conducted alternatively for the three outcome variables related to refugee feelings: life satisfaction (HAPPY), attitudes to democracy (ATTITUDES2DEMOCRACY) and attitudes to women rights (ATTITUDES2WOMEN). For each outcome variable we tried two specifications regarding economic context (where the regional nesteddness was explained with GDP growth or unemployment rate and three specifications related to cultural context (alternatively explaining the regional nesteddness with share of foreigners, share of ultra-right votes or the degree of urbanization of the community in which the refugee lives). The results regarding outcome variable HAPPY are presented in Table 11 below and the results for the other outcome variables, which were statistically and economically very similar, are available upon request from the authors.

{Table 11}

The main take from our estimations in Table 11 and the related results for the alternative outcome variables can be summarised as follows. Indeed, the individual attitudes seem to cluster in regional means (on NUTS2 level). This nesting is indeed significantly sensitive to both economic context and cultural context. The magnitude of the effect from the cultural context is however much smaller, although significant. Its size is somewhat more important in the case of attitudes to women rights and democracy than in the case of general life satisfaction and happiness. These findings confirm the presence of what CBD terms as Platonian bias of cultural relativity (see Tubadji 2020). This finding motivates our further CBD implementation for explaining the sources of this bias.

The re-estimation of the same hierarchical model, yet this time explaining the local clustering with cultural entropy indicators is presented in Table 12. We use three alternative measures for cultural entropy, as described above. We also consider the regional clustering alternatively on NUTS2 (38 groups) and NUTS1 level (16 groups). These variations define our specifications in Table 12 below.

{Table 12}

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The main take from our estimations in Table 12 can be summarised as follows. Indeed, after controlling for the regional effect of unemployment and local GDP growth (which should capture local economic deprivation), there still remains significant regional clustering in people's level of happiness which is clearly explained by the cultural entropy in a place. In other words, the variation in levels of affect and cultural self-identification propensities of people in places are significantly predicted by the local balance between traditional and modern cultural attitudes. The latter findings are consistent with CBD's expectations for the effect of cultural entropy, with previous CBD findings that equate cultural entropy to local tolerance (Tubadji 2024) and with Richard Florida's finding on the effect of tolerance on spatial frictions and the migration of creative individuals (Florida, Mellander and Stolarick 2008).

Robustness Check 3

Robustness check 3 entails comparing the model of regional nestedness with only an intercept to the models using an explanatory variable for the economic context or the cultural context in the region. Results are presented in Table 13.

{Table 13}

Across all post-estimation likelihood ratio tests conducted – it seems that the economic endogeneity of the polarisation on regional level is often the dominating effect over the local cultural attitude effect. The only significant tests are shown in Table 13. These results are especially important for the following reasons. Apparently, while the local cultural signalling seems to explain part of the regional variation, the important difference in the feelings and attitudes of refugees is associated not only with the cultural context but with the economic relative deprivation on aggregate level in the place of living. This is consistent with previous findings of individual and local interaction and polarised voting behaviour for the UK, using the so-called Tiebout-Hirschman-Rothschild model (see Tubadji, Colwill and Weber 2021). In other words, while individual behaviour is driven by perceived relative deprivation in fact the important regional context in which radicalization and polarization develop is the context of economic deprivation.

5 Conclusion

This paper examines a culturally motivated CBD model of discrimination on group level (through negative distinction) which results in emotional scarring and triggering of behavioural polarization of refugees in Germany.

Using share data from the German Socio-Economic Panel (IAB-BAMF-SOEP) for the period 2016-2019 on individual level, we test our hypothesis for the existence of a micro-economic mechanism of relative deprivation triggered by subjective experience of the refugee of being discriminated in the recipient country, which leads to the negative polarization of the individual. We use novel approaches to measuring polarization and employ alternative quantifications of polarization over democratic views, female rights and general feeling of happiness, as well as prospects of future study and work. We employ alternative estimation approaches including panel estimators, survival analysis and hierarchical modelling.

We find that discrimination clearly leads to individual polarization to the negative extreme of attitudes. On the contrary, if a person is firmly feeling that they have not been discriminated, this gives them a motivation for developing attitudes on the positive extreme of the spectrum of affect. Mixed experiences with radicalization leave the individual in a neutral zone of attitudes. Furthermore, we find that parental transmission of education affects only the attitudes to female rights, which clearly is a traditional cultural attitude among the type of refugees under analysis. We find clear prominent association between Muslim religion and this attitude as well.

Meanwhile, regarding the spatial effects, we find an interesting clustering of refugees either in the rural or in the urban part of the particular region they are sent to, and then the rurality has its effect on the polarization itself. We explain this with an instinctive self-selection to sort spatially together, yet it seems to make a difference whether this clustering happens in urban areas or not. These findings document the complexity of migrant clustering which is not only classical diaspora oriented (which can also be modelled consistent with identity economics as seen in Prinz 2019) but responding to the local cultural and economic context in endogenous manner.

One limitation of the current study is that we have panel data only with regard to the attitude to happiness. The availability of the panel data allows us to understand the dynamics and determinants of transition from non-polarized to polarised state and backwords in greater detail. Alternative datasets or new waves from the same dataset might allow for extending the analysis from happiness to other alternative attitudes such as democratic views and female rights which are a very good fit as quantification for the behavioural polarization topic with clear implications for voting. Even with its advantages as a

panel dataset, the available panel is relatively short, so better data will always be beneficial as it will allow for deeper insight into the dynamics.

In conclusion, our findings suggest that on individual level, a micro-mechanism of perceived cultural discrimination evokes individual polarization as human behaviour responds to pain and incentives from the context. Yet, while on individual level people are moved to radicalize and polarize seemingly by perceived cultural discrimination feelings, these feelings evolve and matter more significantly on spatial level when people are situated in a local context of economic deprivation. Finally, the local level of affect and its derived cultural self-identification seem to be defined by local levels of economic deprivation and by the local balance between traditional and modern attitudes in a place (i.e. by what CBD calls cultural entropy).

References

Akerlof, G. A., & Kranton, R. E. (2010). Identity Economics: How Our Identities Shape Our Work, Wages, and Wellbeing. Princeton University Press.

Alesina, A., & Tabellini, M. (2022). The Political Effects of Immigration: Culture or Economics? (No. w30079). National Bureau of Economic Research.

Alesina, A., & La Ferrara, E. (2014). A test of racial bias in capital sentencing. American Economic Review, 104(11), 3397-3433.

Alesina, A., Miano, A., & Stantcheva, S. (2020, May). The polarization of reality. In AEA Papers and Proceedings (Vol. 110, pp. 324-28).

Alesina, A., Stantcheva, S., & Teso, E. (2018). Intergenerational mobility and preferences for redistribution. American Economic Review, 108(2), 521-54.

Allport, G. W. (1954). The Nature of Prejudice. Cambridge, MA: Addison-Wesley.

Ang, D. (2021). The effects of police violence on inner-city students. The Quarterly Journal of Economics, 136(1), 115-168.

Arceo-Gomez, E. O., & Campos-Vazquez, R. M. (2014). Race and marriage in the labor market: A discrimination correspondence study in a developing country. American Economic Review, 104(5), 376-80.

Barrow, L., & Rouse, C. E. (2005). Do returns to schooling differ by race and ethnicity?. American Economic Review, 95(2), 83-87.

Bénabou, R., & Tirole, J. (2016). Mindful economics: The production, consumption, and value of beliefs. Journal of Economic Perspectives, 30(3), 141-64.

Black, S. E., Cortes, K. E., & Lincove, J. A. (2015). Academic undermatching of high-achieving minority students: Evidence from race-neutral and holistic admissions policies. American Economic Review, 105(5), 604-10.

Bourdieu, P. (1984). Distinction: A social critique of the judgement of taste. Harvard University Press.

Charles, K. K., Hurst, E., & Roussanov, N. (2009). Conspicuous consumption and race. The Quarterly Journal of Economics, 124(2), 425-467.

Chadi, A., & Krapf, K. (2015). The Protestant Fiscal Ethic: Religious Confession and Euro Skepticism in Germany, German Socio-Economic Panel Study (SOEP), Berlin, April.

Charles, K. K., Hurst, E., & Stephens, M. (2008). Rates for vehicle loans: race and loan source. American Economic Review, 98(2), 315-20.

Chetty, R., Hendren, N., Jones, M. R., & Porter, S. R. (2020). Race and economic opportunity in the United States: An intergenerational perspective. The Quarterly Journal of Economics, 135(2), 711-783.

Collins, W. J., & Margo, R. A. (2011). Race and Home Ownership from the End of the Civil War to the Present. American Economic Review, 101(3), 355-59.

Davies, J. (1962) 'Toward a Theory of Revolution', American Sociological Review, 27:5-19.

Davis, L. (2019) Growth, Inequality and Tunnel Effects: A Formal Mode, Journal of Happiness Studies, 20: 1103–1119.

Derrida, J. (1967) Of Grammatology, De la grammatologie (Paris: Les Éditions de Minuit, 1967). The johns Hopkins University Press: Baltimore.

Deutscher, N. (2020). What drives second generation success? The roles of education, culture, and context. Economic Inquiry, 58(4), 1707-1730.

Dorling, D. (2018) 'Brexit and Britain's Radical Right Political Insight', 9(4): 16-18.

Eaton, B. C., Eswaran, M., & Oxoby, R. J. (2011). 'Us' and 'Them': the origin of identity, and its economic implications. Canadian Journal of Economics/Revue canadienne d'économique, 44(3), 719-748.

Eckhardt, C., Norlander, B., & Deffenbacher, J. (2004). The assessment of anger and hostility: A critical review. Aggression and Violent Behavior, 9(1), 17-43.

Eliaz, K., & Spiegler, R. (2020). A model of competing narratives. American Economic Review, 110(12), 3786-3816.

Ellison, G., & Pathak, P. A. (2016). The Efficiency of Race-Neutral Alternatives to Race-Based Affirmative Action: Evidence from Chicago's Exam Schools (No. w22589). National Bureau of Economic Research.

Hall, J., & Ludwig, U. (1995). German unification and the 'market adoption'hypothesis. Cambridge Journal of Economics, 19(4), 491-507.

Hirschman, A. O. and M. Rothschild (1973) The changing tolerance for income inequality in the course of economic development, Quarterly Journal of Economics, 87(4): 544–566.

Horst, U., Kirman, A., & Teschl, M. (2006). Changing identity: the emergence of social groups.Institute for Advanced Study, Economics Working Paper 0078, September.

IAB-BAMF-SOEP (2021). Survey of Refugees (M3-M5), data of the years 2016-2021, DOI: 10.5684/soep.iab-bamf-soep-mig.2021.1

Leeson, P. T. (2017). WTF?!: An economic tour of the weird. Stanford University Press.

Loury, G. C. (2003). Racial stigma: Toward a new paradigm for discrimination theory. American Economic Review, 93(2), 334-337.

Luca, D., Terrero-Davila, J., Stein, J. and Lee, N., 2023. Progressive cities: Urban–rural polarisation of social values and economic development around the world. Urban Studies, 60(12), pp.2329-2350.

Nikolova, M., & Graham, C. (2015). In transit: The well-being of migrants from transition and post-transition countries. Journal of Economic Behavior & Organization, 112, 164-186.

Mantegazzi, D. (2020). The geography of political ideologies in Switzerland over time. Spatial Economic Analysis, 1-19.

McCann, P. (2020). Perceptions of regional inequality and the geography of discontent: Insights from the UK. Regional Studies, 54(2), 256-267.

Myrdal, G. (1944) An American Dilemma: The Negro Problem and Modern Democracy. New York: Harper.

Nurse, A. and O. Sykes (2019) It's more complicated than that!: Unpacking 'Left Behind Britain' and some other spatial tropes following the UK's 2016 EU referendum, Local Economy, 34(6) 589–606.

Oxoby, R. J. (2004). Cognitive dissonance, status and growth of the underclass. The Economic Journal, 114(498), 727-749.

Papyrakis, E., & Mo, P. H. (2014). Fractionalization, polarization, and economic growth: identifying the transmission channels. Economic Inquiry, 52(3), 1204

Parsons, C. A., Sulaeman, J., Yates, M. C., & Hamermesh, D. S. (2011). Strike three: Discrimination, incentives, and evaluation. American Economic Review, 101(4), 1410-35.

Polanyi, K. (1944) The Great Transformation. New York: Rinerhart & Co. Inc.

Reiser, C. (2001). Reflections on anger: Women and men in a changing society. Greenwood Publishing Group.

Rodríguez-Pose, A. (2018) The revenge of the places that don't matter (and what to do about it). Cambridge Journal of Regions, Economy and Society, 11(1): 189-209.

Scitovsky, T. (1976). The joyless economy: An inquiry into human satisfaction and consumer dissatisfaction. Oxford University Press.

Schelling, T. C. (1969). Models of segregation. The American economic review, 59(2), 488-493.

Schelling, T. C. (1978). Micromotives and Macrobehavior. New York, WW Norton.

Shiller, R. J. (2017). Narrative economics. American economic review, 107(4), 967-1004.

Sorensen, T., Sarnikar, S., & Oaxaca, R. L. (2012). Race and gender differences under federal sentencing guidelines. American Economic Review, 102(3), 256-60.

Tiebout, C. (1956) A pure theory of local expenditures. Journal of Political Economy, 64(5), 416-424.

Thorbecke, E., & Charumilind, C. (2002). Economic inequality and its socioeconomic impact. World development, 30(9), 1477-1495.

Tubadji, A. (2012). Culture-Based Development: Empirical Evidence for Germany. International Journal of Social Economics, 39(9):690-703.

Tubadji, A. (2013). Culture-Based Development: Culture and Institutions – Economic Development in the Regions of Europe. International Journal of Society Systems Science, 5(4):355-391.

Tubadji, A. (2020). Value-free analysis of values: A culture-based development approach. Sustainability, 12(22), 9492.

Tubadji, A. (2023). Culture Based Development in the Regions of China. Journal of Economic Issues, 57(1), 8-35.

Tubadji, A. (2024). Cultural Entropy, Innovation and Growth. Manuscript submitted to the NBER Workshop on Place Based Development 2024.

Tubadji, A., Colwill, T., & Webber, D. (2021). Voting with your feet or voting for Brexit: The tale of those stuck behind. Regional Science Policy & Practice, 13(2), 247-278.

Tubadji, A. and P. Nijkamp (2019) Cultural attitudes, economic shocks and political radicalization. Annals of Regional Science, 62(3): 529-562.

Tubadji, A., Gheasi, M., & Nijkamp, P. (2017). Immigrants' socio-economic achievements and cultural diversity. International Journal of Manpower.

Veblen, Thorstein (1934) [1899]. The Theory of the Leisure Class: An Economic Study of Institutions. Introduction by Stuart Chase. New York: The Modern Library.

White, S. (2013). The real little ice age. Journal of Interdisciplinary History, 44(3), 327-352.

Wrenn, M. V. (2020). Selling salvation, selling success: neoliberalism and the US Prosperity Gospel. Cambridge Journal of Economics.

Wittgenstein, L. (1922). Tractatus Logico-Philosophicus, Dover Publications: UK.

Wittgenstein, L.J.J.(1929[1953]). Philosophical Investigations, ed. G.E.M. Anscombe and R. Rhees, trans. G.E.M. Anscombe, Oxford: Blackwell.
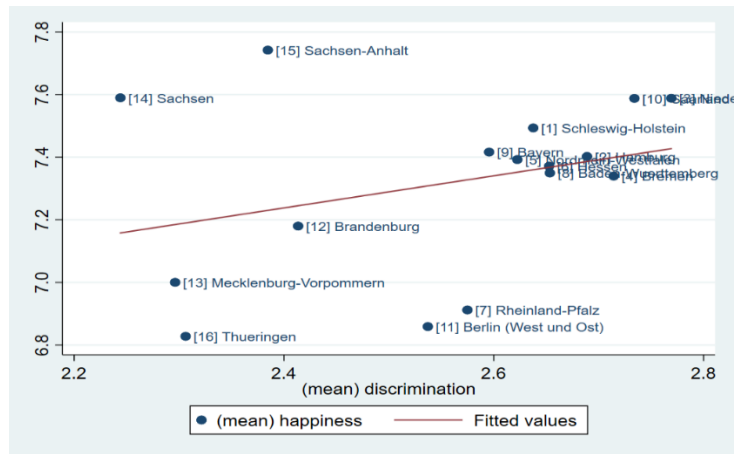
Happiness and Discrimination
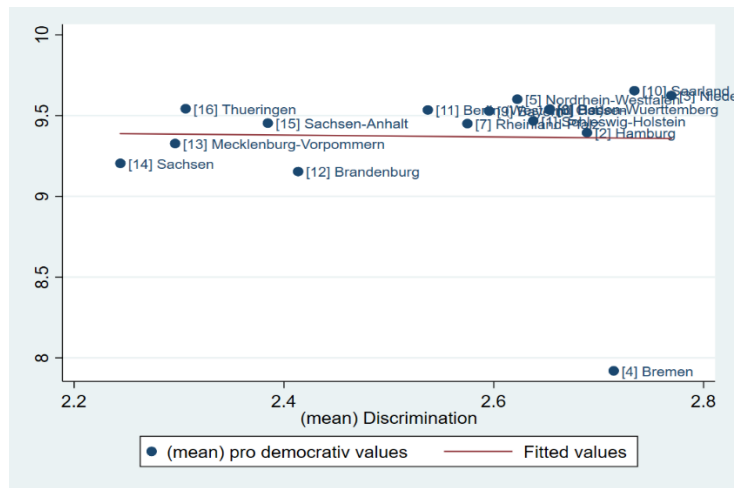
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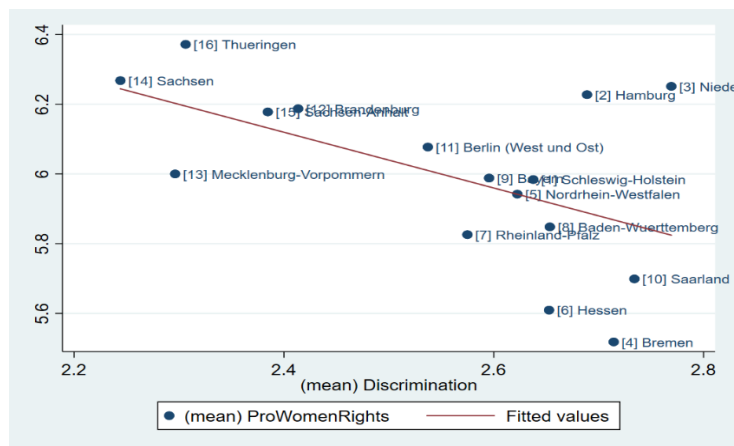
Pro-Female Rights and Discrimination

Figure 1: Discrimination & Individual Polarisation of Attitudes

Note: *The figures present two-way scatter plots.*
Source: Authors' calculations.
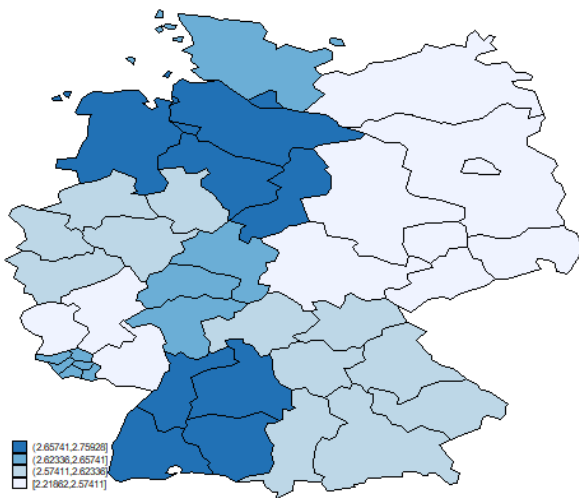
Discrimination - Levels
Note: *The map presents the spatial distribution..*
Source: Authors' calculations.
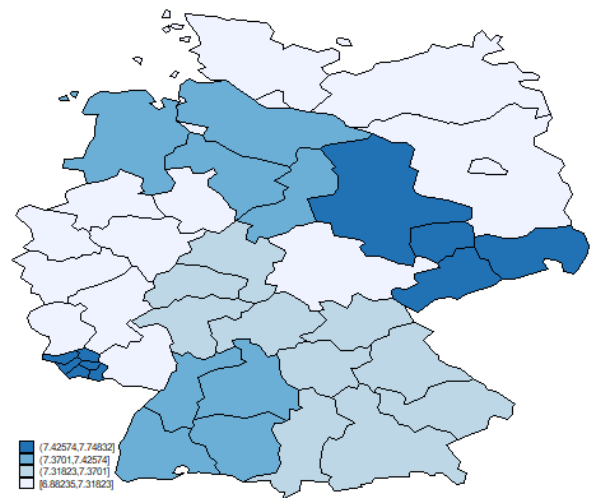
Happiness - Levels
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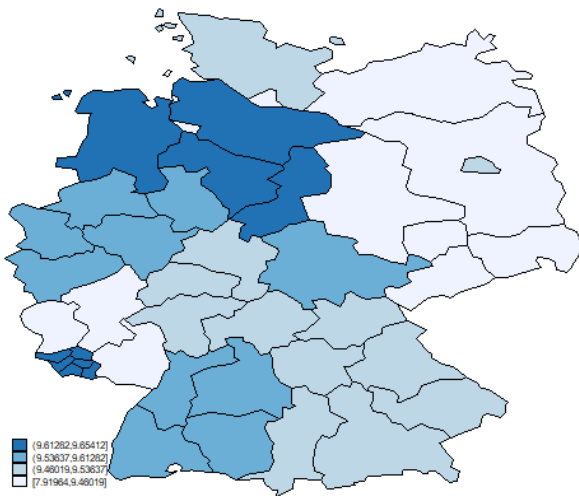
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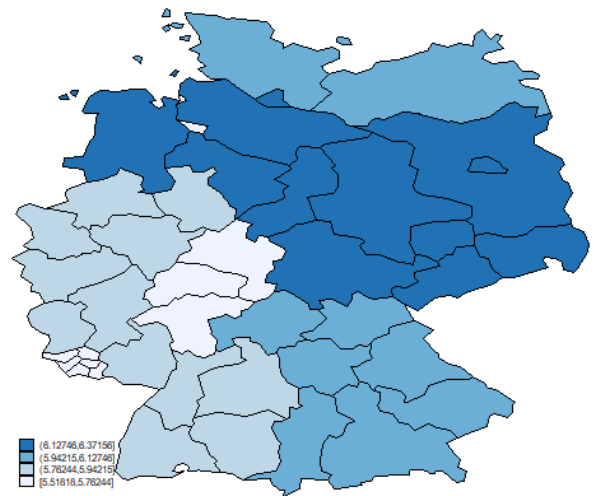
Pro-female rights - Levels
Note: *The map presents the spatial distribution.*
Source: Authors' calculations.

Figure 2: GDP per Bundeslander

Note: The maps show the levels of the corresponding variable in each Bundeslander.
Source: Authors' calculations.
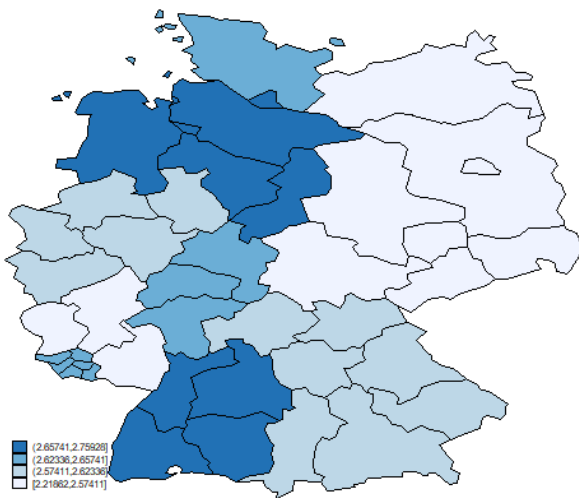
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Source: Authors' calculations.
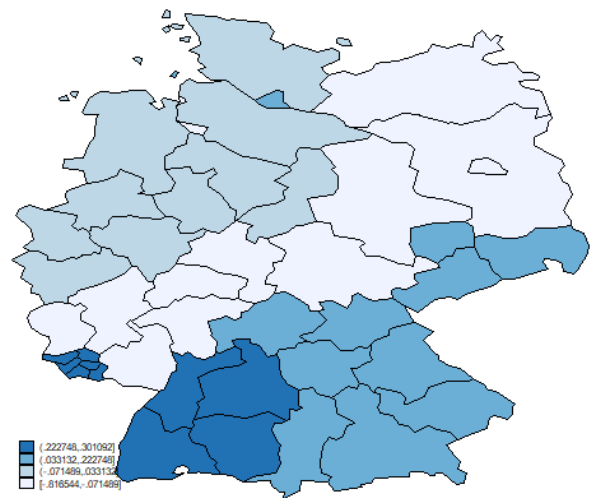
Happiness – Coef.
Note: *The map presents the spatial distribution.*
Authors' calculations.
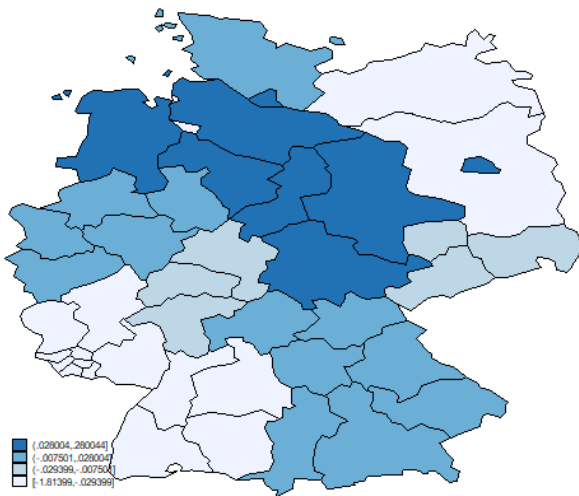
Pro-democratic – Coef.
Note: *The map presents the spatial distribution.*
Source: Authors' calculations.
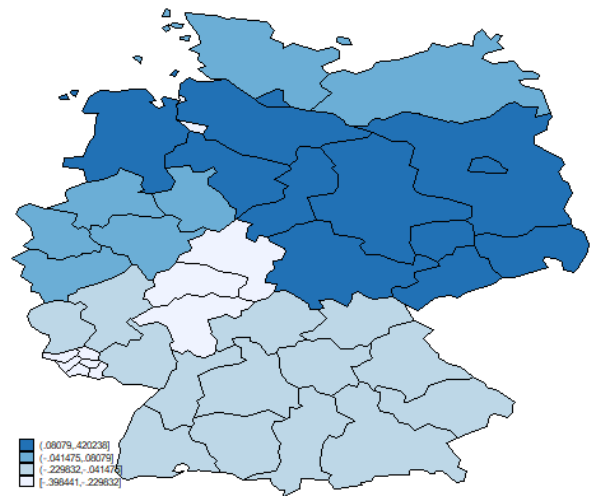
Pro-female rights – Coef.
Note: *The map presents the spatial distribution.*
Source: Authors' calculations.

Figure 3: GDP per Bundeslander - coefficients

Note: The maps show the regression coefficients for the corresponding variable explaining local discrimination.
Source: Authors' calculations.
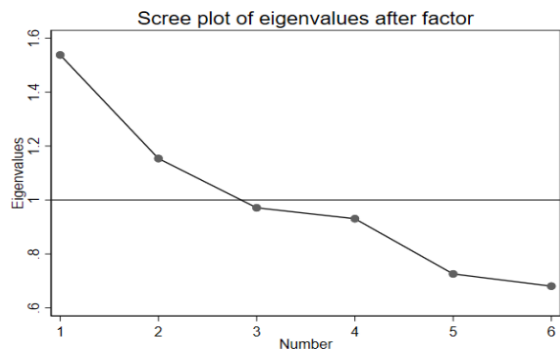
Elbow test for pcf with 6 WVS variables
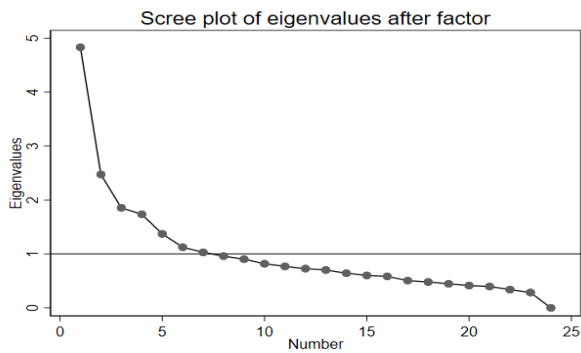
Cultural Entropy 1

Elbow test for pcf with 24 WVS variables
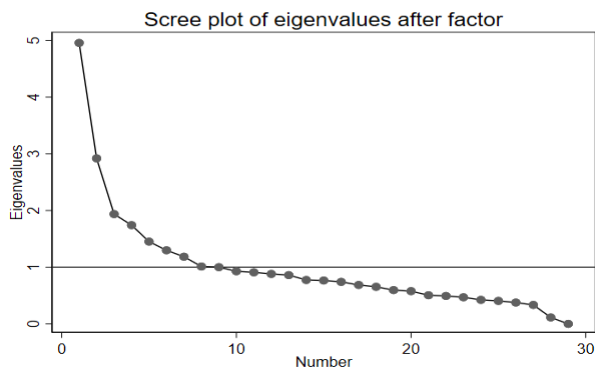
Cultural Entropy 2

Elbow test for pcf with 30 WVS variables
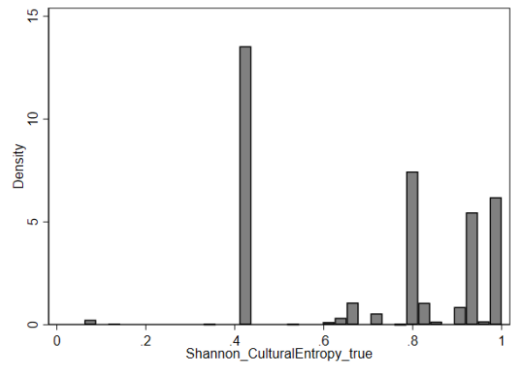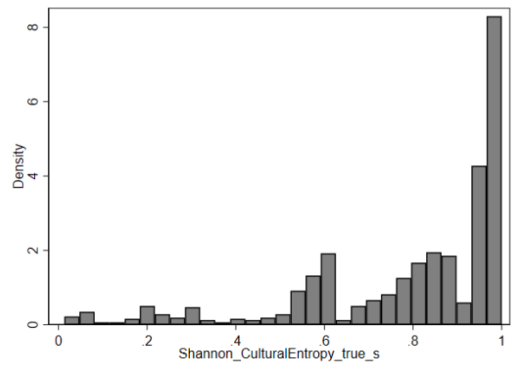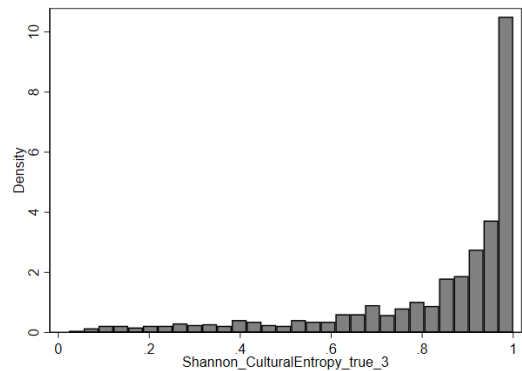
Cultural Entropy 3

Figure 4: Elbow test from Principal Component Factor Analysis (pcf) obtaining the factors LC and CH (to the left) and a histogram of the obtained Shannon Entropy

Note: The CBD Cultural Entropy index quantifies the local balance between these LC and CH factors. Where more than 2 factors were identified during the pcf analysis and its corresponding Elbow test, the first two were kept for analysis as CH and LC (see Appendix 2 for more details).

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Table 1 Polarization of Attitudes about General Happiness

	(1) ols	(2) polar	(3) neg-wide	(4) neg-narrow
Discrimination (ref never)	0.000	0.000	0.000	0.000
Seldom	-0.599***	-0.083***	0.036***	0.005
Frequently	-1.100***	-0.073**	0.099***	0.023**
Subj health	0.533***	0.050***	-0.050***	-0.009***
Permanent contract	0.272+	0.029	-0.030	-0.015
Temp contract	0.169	0.007	-0.037*	-0.012
LM-status (ref job search)	0.000	0.000	0.000	0.000
LM-Inactive	0.225**	-0.001	-0.030**	-0.019***
Edu attainment: degree (ref no degree)	0.000	0.000	0.000	0.000
VET training secondary level	-0.140	-0.041	-0.005	-0.004
University degree	-0.445***	-0.104***	0.025*	-0.006
No info	-0.194	0.023	0.016	0.016*
Syria	-0.790***	-0.067***	0.068***	0.025***
Country of origin (ref. Afghanistan)	0.000	0.000	0.000	0.000
Iraq	-0.452***	-0.017	0.041**	0.028***
Eritrea	-0.080	0.009	-0.004	0.009
Gender (ref female)	0.000	0.000	0.000	0.000
Male	-0.284***	-0.010	0.035***	0.006
Marital status (ref married)	0.000	0.000	0.000	0.000
Single	-0.416***	-0.034+	0.048***	0.009+
Widowed/separated	-0.809***	-0.053**	0.086***	0.018**
Refugee status in process	-0.319***	-0.005	0.033**	0.009+
Refugee status (ref granted)	0.000	0.000	0.000	0.000
Refugee status not granted	-0.492***	-0.037	0.073***	0.013
Other status	0.051	0.051+	-0.014	-0.003
German language proficiency	0.108**	-0.019**	-0.011*	-0.005*
Duration of move (ref below 32 days)	0.000	0.000	0.000	0.000
Longer than 31 days	-0.170*	-0.029+	0.002	0.006
Denomination (ref Christian)	0.000	0.000	0.000	0.000
Muslim	0.043	-0.013	-0.024	0.001
Others denomination	0.184	0.037	-0.029	0.000
No denomination	0.190	-0.002	-0.019	0.001
Housing (ref shelter)	0.000	0.000	0.000	0.000
Private housing	0.718***	0.072***	-0.056***	-0.012**
Constant	5.955***	0.128	0.200**	0.048
Number of persons	5555	5555	5555	5555
Adj. R2	0.165	0.069	0.090	0.024
F Statistics	25.942	8.348	13.063	3.724

Note. AREG regression coefficients.
Controls: NUTS2 (absorbed), age, parental education, year of immigration, community size, sensitive questions.
Data. GSOEP V36 - IAB-SOEP-BAMF refugee subsample.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 2: Polarization on Attitudes about Democracy

	(1)	(2)	(3)	(4)
	ols	polar	neg-wide	neg-narrow
Discrimination (ref never)	0.000	0.000	0.000	0.000
Seldom	-0.105**	-0.035*	0.006	-0.000
Frequently	-0.412***	-0.066*	0.023***	0.006*
Subj health	0.043**	0.006	-0.003*	-0.001
Permanent contract	0.015	0.014	0.003	0.003
Temp contract	-0.070	-0.010	0.007	0.001
LM-status (ref job search)	0.000	0.000	0.000	0.000
LM-Inactive	-0.040	-0.001	0.004	-0.000
Edu attainment: degree (ref no degree)	0.000	0.000	0.000	0.000
VET training secondary level	-0.000	-0.095**	-0.005	-0.002
University degree	0.147**	0.011	-0.007+	0.001
No info	-0.118	-0.002	0.014*	0.002
Syria	0.565***	0.110***	-0.022***	-0.008***
Country of origin (ref. Afghanistan)	0.000	0.000	0.000	0.000
Iraq	0.449***	0.100***	-0.016**	-0.009***
Eritrea	0.422***	0.039	-0.030**	-0.011**
Male	-0.035	-0.005	0.009**	0.001
Marital status (ref married)	-0.031	0.000	0.000	0.000
Single	0.000	0.018	-0.005	-0.001
Widowed/separated	-0.032	0.029	0.002	0.006**
Refugee status in process	-0.106*	0.005	0.013**	0.004*
Refugee status (ref granted)	0.000	0.000	0.000	0.000
Refugee status not granted	0.162+	0.037	0.000	0.001
Other status	0.064	0.054+	0.006	-0.000
German language proficiency	0.037+	0.009	-0.001	-0.000
No info	-0.050	-0.004	0.004	0.001
Duration of move (ref below 32 days)	0.000	0.000	0.000	0.000
Longer than 31 days	-0.001	0.010	0.002	-0.002
Denomination (ref Christian)	0.000	0.000	0.000	0.000
Muslim	-0.019	-0.042	-0.006	-0.001
Others denomination	-0.030	-0.097**	-0.011	-0.002
No denomination	-0.074	-0.056	0.002	-0.001
Housing (ref shelter)	0.000	0.000	0.000	0.000
Private housing	-0.062	-0.023	0.003	0.002
Constant	8.169***	0.379**	0.049+	0.023+
Number of persons	5194	5194	5194	5194
Adj. R2	0.085	0.085	0.022	0.014
F statistic	7.825	3.143	2.836	1.793

Note. AREG regression coefficients.

Controls: NUTS2 (absorbed), age, parental education, year of immigration, community size, sensitive questions.

Data: GSOEP V36 - IAB-SOEP-BAMF refugee subsample

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3: Polarization on Attitudes about Female Rights

	(1) OLS	(2) polar	(3) neg-wide	(4) neg-narrow
Discrimination (ref never)	0.000	0.000	0.000	0.000
Seldom	-0.140***	0.051**	0.018*	0.003
Frequently	-0.316***	0.065*	0.091***	0.000
Subj health	0.035*	-0.018**	-0.003	0.000
Permanent contract	0.028	-0.006	0.005	-0.006
Temp contract	0.043	-0.047	-0.002	0.002
LM-status (ref job search)	0.000	0.000	0.000	0.000
LM-Inactive	0.008	-0.007	-0.008	-0.001
Edu attainment: degree (ref no degree)	0.000	0.000	0.000	0.000
VET training secondary level	0.074	-0.031	-0.008	-0.007
University degree	0.252***	-0.081***	-0.049***	-0.001
No info	-0.065	0.059*	-0.010	0.003
Syria	-0.380***	0.137***	0.055***	0.005
Country of origin (ref. Afghanistan)	0.000	0.000	0.000	0.000
Iraq	-0.244***	0.089**	0.053**	0.008+
Eritrea	-0.365***	0.118**	0.082**	0.004
Male	-0.278***	0.085***	0.034***	0.004
Marital status (ref married)	0.000	0.000	0.000	0.000
Single	-0.030	0.015	0.007	0.001
Widowed/separated	-0.043	0.003	0.011	0.002
Refugee status in process	0.115*	-0.047*	0.013	-0.001
Refugee status (ref granted)	0.000	0.000	0.000	0.000
Refugee status not granted	0.031	0.000	0.006	-0.010+
Other status	0.047	-0.052	0.022	0.001
German language proficiency	0.166***	-0.050***	-0.023***	-0.005***
Duration of move (ref below 32 days)	0.000	0.000	0.000	0.000
Longer than 31 days	0.012	-0.012	-0.005	0.006+
Denomination (ref Christian)	0.000	0.000	0.000	0.000
Muslim	-0.346***	0.132***	0.055**	-0.003
Others denomination	-0.385***	0.126***	0.063**	-0.009
No denomination	-0.196*	0.069+	0.032	-0.002
Housing (ref shelter)	0.000	0.000	0.000	0.000
Private housing	0.040	-0.021	0.012	-0.007*
Constant	5.717***	0.584***	0.064	0.049*
Number of persons	5383	5383	5383	5383
Adj. R2	0.082	0.060	0.026	0.010
F Statistic	8.151	5.675	3.379	1.941

Note. AREG regression coefficients.
Controls: NUTS2 (absorbed), age, parental education, year of immigration, community size, sensitive questions
Data: GSOEP V36 - IAB-SOEP-BAMF refugee subsample
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4: Polarization of Happiness (Becoming Unhappy) over Waves

	(1) ols	(2) re	(3) fe
Discrimination (ref never)	0.000	0.000	0.000
Seldom	-0.503***	-0.447***	-0.313***
Frequently	-0.964***	-0.837***	-0.616***
Subj health	0.462***	0.444***	0.374***
Permanent contract	0.453***	0.279***	0.165+
Temp contract	0.377***	0.237***	0.188*
LM-status (ref job search)	0.000	0.000	0.000
LM-Inactive	0.316***	0.329***	0.085
Edu attainment: degree (ref no degree)	0.000	0.000	0.000
VET training secondary level	-0.056	-0.033	0.508
University degree	-0.355***	-0.320***	2.138
No info	-0.090	-0.135	-1.085*
Syria	-0.537***	-0.457***	
Country of origin (ref. Afghanistan)	0.000	0.000	
Iraq	-0.279**	-0.255**	
Eritrea	-0.008	-0.041	
Male	-0.273***		
Marital status (ref married)	0.000	0.000	0.000
Single	-0.463***	-0.515***	-0.036
Widowed/separated	-0.707***	-0.688***	-0.537***
Refugee status in process	-0.375***	-0.238***	-0.074
Refugee status (ref granted)	0.000	0.000	0.000
Refugee status not granted	-0.622***	-0.575***	-0.301+
Other status	-0.095	-0.020	-0.072
German language proficiency	0.096***	0.029	0.071*
Denomination (ref Christian)	0.000	0.000	
Muslim	-0.015	-0.077	
Others denomination	0.081	0.077	
No denomination	0.000	-0.009	
Housing (ref shelter)	0.000	0.000	0.000
Private housing	0.655***	0.601***	0.376***
N-interview	-0.162***		
Constant	5.638***	5.638***	9.123***
Number of persons	13064	13064	13064
R2 adj.	0.139		
R2 within		0.041	0.049
R2 between		0.192	0.010
F statistic	45.923		

Note. OLS/panel regression coefficients.

Controls: NUTS2 (absorbed), age, parental education, year of immigration, community size, sensitive questions

Data: GSOEP V36 - IAB-SOEP-BAMF refugee subsample

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 5: Change of happiness over survey waves (2016-2019)

Time t	Time t+1		
	Happy	Unhappy	Total
Happy	7,037	402	7,439
Row-%	94.6	5.4	100
Unhappy	472	156	628
Row-%	75.16	24.84	100
Total	7,509	558	8,067
Row-%	93.08	6.92	100

Pearson chi2(1) = 339.7974; Pr = 0.000
Data: GSOEP V36 - IAB-SOEP-BAMF refugee subsample

Table 6: Robustness Check 1 – Happiness (Scale 0-10) for Syrian /Non-Syrian

	(1) Syrian	(2) Non-Syrian
Discrimination (ref never)	0.000	0.000
Seldom	-0.595***	-0.611***
Frequently	-1.501***	-0.670***
Subj health	0.503***	0.556***
Permanent contract	0.237	0.472
Temp contract	-0.022	0.602*
LM-status (ref job search)	0.000	0.000
LM-Inactive	0.220*	0.338*
Edu attainment: degree (ref no degree)	0.000	0.000
VET training secondary level	-0.023	-0.444
University degree	-0.505***	-0.321+
No info	-0.176	-0.247
Male	-0.345***	-0.187+
Marital status (ref married)	0.000	0.000
Single	-0.476***	-0.378**
Widowed/separated	-0.696***	-0.984***
Refugee status in process	-0.319**	-0.342**
Refugee status (ref granted)	0.000	0.000
Refugee status not granted	-0.559+	-0.482**
Other status	0.126	-0.136
Duration of move (ref below 32 days)	0.000	0.000
Longer than 31 days	-0.199+	-0.057
German language proficiency	0.172***	0.010
Denomination (ref Christian)	0.000	0.000
Muslim	0.011	-0.017
Others denomination	-0.077	-0.006
No denomination	0.144	0.037
Housing (ref shelter)	0.000	0.000
Private housing	0.873***	0.554***
Constant	4.962***	6.113***
Number of persons	3486	2069
Adj. R2	0.170	0.150
F statistic	18.607	9.674

Note. AREG regression coefficients.

Controls: NUTS2 (absorbed), community size, year of immigration, age, parental edu, sensitive questions

Statistical significance at: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Data: IAB-SOEP-BAMF refugee subsample of GSOEP V36

Table 7: Robustness Check 1 – Pro-Democratic (Scale 0-10) for Syrian /Non-Syrian

	(1) Syrian	(2) Non-Syrian
Discrimination (ref never)	0.000	0.000
Seldom	-0.043	-0.254**
Frequently	-0.402***	-0.539***
Subj health	0.032+	0.058+
Permanent contract	-0.074	0.066
Temp contract	-0.135+	0.045
LM-status (ref job search)	0.000	0.000
LM-Inactive	-0.035	-0.053
Edu attainment: degree (ref no degree)	0.000	0.000
VET training secondary level	0.013	0.115
University degree	0.121**	0.232+
No info	-0.038	-0.279+
Male	-0.023	-0.035
Marital status (ref married)	0.000	0.000
Single	0.052	0.066
Widowed/separated	0.016	0.017
Refugee status in process	0.007	-0.212*
Refugee status (ref granted)	0.000	0.000
Refugee status not granted	0.104	0.073
Other status	0.044	0.168
Duration of move (ref below 32 days)	0.000	0.000
Longer than 31 days	-0.060	-0.056
German language proficiency	0.057**	-0.011
Denomination (ref Christian)	0.000	0.000
Muslim	-0.026	-0.225*
Others denomination	-0.017	-0.101
No denomination	-0.016	-0.375*
Housing (ref shelter)	0.000	0.000
Private housing	-0.028	-0.114
Constant	8.247***	9.381***
Number of persons	3329	1865
Adj. R2	0.065	0.077
F statistic	2.993	2.488

Note. AREG regression coefficients.
Controls: NUTS2 (absorbed), age, community size, year of immigration, age, parental edu, sensitive questions
Statistical significance at: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Data: IAB-SOEP-BAMF refugee subsample of GSOEP V36

Table 8: Robustness Check 1 – Pro-Female Rights (Scale 1-7) for Syrian /Non-Syrian

	(1) Syrian	(2) Non-Syrian
Discrimination (ref never)	0.000	0.000
Seldom	-0.140**	-0.137*
Frequently	-0.460***	-0.157
Subj health	0.016	0.057*
Permanent contract	0.062	-0.006
Temp contract	-0.007	0.178
LM-status (ref job search)	0.000	0.000
LM-Inactive	0.027	-0.009
Edu attainment: degree (ref no degree)	0.000	0.000
VET training secondary level	0.072	0.036
University degree	0.215***	0.303**
No info	-0.072	-0.052
Male	-0.330***	-0.204**
Marital status (ref married)	0.000	0.000
Single	-0.034	-0.037
Widowed/separated	-0.039	-0.048
Refugee status in process	0.237***	-0.029
Refugee status (ref granted)	0.000	0.000
Refugee status not granted	0.146	-0.046
Other status	0.065	-0.028
Duration of move (ref below 32 days)	0.000	0.000
Longer than 31 days	0.027	0.062
German language proficiency	0.182***	0.152***
Denomination (ref Christian)	0.000	0.000
Muslim	-0.448***	0.003
Others denomination	-0.276+	-0.238*
No denomination	-0.290*	0.111
Housing (ref shelter)	0.000	0.000
Private housing	0.058	0.034
Constant	5.204***	5.547***
Number of persons	3417	1966
Adj. R2	0.095	0.072
F Statistic	7.035	2.766

Note. AREG regression coefficients.
Controls: NUTS2, year of immigration, community size, age, parental edu, sensitive questions
Statistical significance at: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.
Data: IAB-SOEP-BAMF refugee subsample of GSOEP V36

Table 9: Robustness Check 2 – Polarization over Expectation for Education in Germany

	(1) Syrian	(2) Non-Syrian
Discrimination (ref never)	0.000	0.000
Seldom	0.014	0.041+
Frequently	0.015	0.026
Subj health	0.020**	0.011
Permanent contract	-0.119**	-0.017
Temp contract	-0.006	-0.012
LM-status (ref job search)	0.000	0.000
LM-Inactive	-0.011	0.005
Edu attainment: degree (ref no degree)	0.000	0.000
VET training secondary level	0.005	-0.039
University degree	0.046*	0.086**
No info	0.054+	-0.011
Male	-0.029+	0.029
Marital status (ref married)	0.000	0.000
Single	0.090***	0.036
Widowed/separated	0.016	-0.005
Refugee status in process	0.041+	0.053*
Refugee status (ref granted)	0.000	0.000
Refugee status not granted	0.051	0.018
Other status	-0.044	-0.040
Duration of move (ref below 32 days)	0.000	0.000
Longer than 31 days	0.001	-0.007
German language proficiency	0.054***	0.064***
Denomination (ref Christian)	0.000	0.000
Muslim	0.004	-0.021
Others denomination	-0.012	-0.058+
No denomination	0.035	-0.042
Housing (ref shelter)	0.000	0.000
Private housing	-0.003	-0.044*
Constant	0.702***	0.894***
Number of persons	3499	2076
Adj. R2	0.224	0.258
F statistic	22.533	15.670

Note. OLS coefficients.
Further controls: NUTS2, year of immigration, community size, age, parental edu, sensitive questions
Statistical significance at: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Data: IAB-SOEP-BAMF refugee subsample of GSOEP V36

Table 10: Robustness Check 2 – Polarization over Expectation to Work in Germany

	(1) Syrian	(2) Non-Syrian
Discrimination (ref never)	0.000	0.000
Seldom	0.000	0.049
Frequently	-0.048	0.059
Subj health	0.056***	0.048**
LM-status (ref job search)	0.000	0.000
LM-Inactive	-0.146***	-0.155***
Edu attainment: degree (ref no degree)	0.000	0.000
VET training secondary level	0.094	0.157
University degree	0.127***	0.115*
No info	0.009	0.063
Male	0.462***	0.440***
Marital status (ref married)	0.000	0.000
Single	0.104**	-0.039
Widowed/separated	0.145***	0.019
Refugee status in process	-0.007	-0.003
Refugee status (ref granted)	0.000	0.000
Refugee status not granted	0.162+	0.010
Other status	-0.083	-0.041
Duration of move (ref below 32 days)	0.000	0.000
Longer than 31 days	0.009	0.023
German language proficiency	0.122***	0.090***
Denomination (ref Christian)	0.000	0.000
Muslim	-0.035	-0.076+
Others denomination	0.035	-0.201***
No denomination	-0.016	-0.124+
Housing (ref shelter)	0.000	0.000
Private housing	-0.029	-0.002
Constant	2.457***	3.563***
Number of persons	3162	1864
Adj. R2	0.230	0.211
F statistic	25.380	13.904

Note. OLS coefficients.

Further controls: NUTS2, year of immigration, community size, age, parental edu, sensitive questions

Statistical significance at: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Data: IAB-SOEP-BAMF refugee subsample of GSOEP V36

Table 11: The Effect of Regional Socio-Economic Context on Levels of Attitudes (HAPPINESS)

dep. var.																		
								HAPPY										
specification	(1)			(2)			(3)			(4)			(5)			(6)		
	nested			nested - GDP			nested - community size			nested - voting ultra right			nested - unemployment rate			nested - foreigners		
VARIABLES	coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval	
Fixed parameters:																		
ALL	YES			YES			YES			YES			YES			YES		
Constant	6.077***			6.077***			6.077***			6.077***			6.077***			6.077***		
Random-effects Parameters:																		
nuts2: Identity																		
sd(_cons)	0.159***	0.11	0.23	0.159***	0.11	0.23				0.159***	0.11	0.23	0.159***	0.11	0.23	0.159***	0.11	0.23
sd(gdpgrwth)				0.0000000157***	3.17E-11	7.80E-06												
sd(R.community_size)							0.218***	0.16	0.29									
sd(voting_ultra_right)										0.0000452***	5.23E-08	0.03						
sd(UER)													0.0000636***	1.55E-07	0.0260698			
sd(forcou~e)																0.0000106***	2.90E-09	0.04
sd(Residual)	1.960***	1.94	1.98	1.960***	1.94	1.98	1.960***	1.94	1.98	1.960***	1.94	1.98	1.960***	1.94	1.98	1.960***	1.94	1.98
Observations	13,015			13,015			13,015			13,015			13,015			13,015		
Number of groups	38			38			38			38			38			38		
LR test vs. linear model:	Prob >= chibar2 = 0.0000			Prob >= chibar2 = 0.0000			Prob >= chibar2 = 0.0000			Prob >= chibar2 = 0.0000			Prob >= chibar2 = 0.0000			Prob >= chibar2 = 0.0000		

Note: Hierarchical, multilevel model, where nesting is modelled on NUTS2 level for Germany. The individual level of the regression uses all dependent variables from the previous tables. The table above shows the random-effects parameters from the regional nesting, only as intercept (Specification 1) or explained on regional level with respectively: GDP (Specification 2), community size (Specification 3, taken as levels considered as R., hence no sd(_cons) is estimated), share of people who have voted ultra-right in the NUTS2 (Specification 4), unemployment rate (Specification 5), share of foreigners in the local population (Specification 6). The same set of specifications were estimated for the two alternative outcome variables, concerning the attitudes to democracy and attitudes to women rights. Tables are not presented for considerations of space. Results are similar. All results are available upon request from the authors.

Table 12: The Effect of Regional Cultural Context on Levels of Attitudes (HAPPINESS)

	dep. var. HAPPY														
level of nestedness	NUTS1									NUTS2					
specification	(1)			(2)			(3)			(4)			(5)		
	nested - Cultural Entropy 1			nested - Cultural Entropy 2			nested - Cultural Entropy 3			nested - Cultural Entropy 1			nested - Cultural Entropy 3		
VARIABLES	coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval		coef.	95% Conf. Interval	
Fixed parameters:															
ALL (withouth UER & gdpgrowth)	YES			YES			YES			YES			YES		
UER	-0.050			-0.054*			-0.052*			-0.075**			-0.078**		
gdpgrowth	0.000			0.001			0.000			-0.005			-0.004		
Constant	5.580***			5.596***			5.591***			5.719***			5.735***		
Random-effect Parameters:															
sd(_cons)	0.00007**	1.23E-10	39.49	0.00015**	.	.	0.148**	0.089266	0.244148	0.00052**	6.99E-07	0.38	0.163**	0.11	0.23
sd(_Cultural Entropy 1)	0.204**	0.12	0.35							0.225**	0.16	0.32			
sd(_Cultural Entropy 2)				0.187**	0.11	0.31									
sd(_Cultural Entropy 3)							0.00013**	3.04E-10	58.11997				0.00020**	6.65E-08	0.59
sd(_Residual)	1.983**	1.96	2.01	1.983**	1.96	2.01	1.983**	1.96	2.01	1.981**	1.96	2.01	1.981**	1.96	2.01
Observations	13,015			13,015			13,015			13,015			13,015		
Number of groups	16			16			16			38			38		
LR test vs. linear model:	Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000		

Note: Hierarchical, multilevel model, where nesting is modelled on NUTS2 level for Germany. The individual level of the regression uses all dependent variables from the previous tables. The table above shows the random-effects parameters from the regional nesting, where the higher aggregation level is NUTS1 for Specifications 1,2 & 3 and NUTS2 for Specifications 4 & 5. The regional level is explained with respectively: Cultural Entropy 1 (Specification 1), Cultural Entropy 2 (Specification 2), Cultural Entropy 3 (Specification 3), Cultural Entropy 1 (Specification 4), Cultural Entropy 3 (Specification 5). The specification with Cultural Entropy 2 on NUTS2 level could not converge in likelihood when performing gradient-rate optimization, so it cannot be reported. Cultural Entropy 1, 2 and 3 are estimated using Shannon Entropy formula applied for alternative quantifications of local CH and LC (see Appendix 2 for details on measurement of local cultural capital, and its CH and LC components, whose balance in the complex set cultural capital is termed Cultural Entropy by CBD (see Tubadji 2024)).

Table 13: Robustness Check 3 - Likelihood-ratio test for the explanatory power of Economic Context as reason for the Regional Level Nestedness

GDP important regional nestedness	Unemployment rate - important regional nestedness
rdemocr_i2	rfem_i2
stored results from Spec. (1) nested, dep. var. ATTITUDES2DEMOCRACY	stored results from Spec. (1) nested, dep. var. ATTITUDES2WOMEN
rdemocr_unemp2	rfem_gdp2
stored results from Spec. (2) nested - unempl. rate, dep. var. ATTITUDES2DEMOCRACY	stored results from Spec. (2) nested - GDP, dep. var. ATTITUDES2WOMEN
. lrtest rdemocr_i2 rdemocr_unemp2	lrtest rfem_i2 rfem_gdp2
Likelihood-ratio test LR chi2(1) = 19.43	Likelihood-ratio test LR chi2(1) = 17.22
(Assumption: rdemocr_i2 nested in rdemocr_unemp2) Prob > chi2 = 0.0000	(Assumption: rfem_i2 nested in rfem_gdp2) Prob > chi2 = 0.0000

Note: Across all specifications in Table 13, for each alternative dependent variable (HAPPY, ATTITUDES2DEMOCRACY, ATTITUDES2WOMEN), we have conducted likelihood-ratio tests between the intercept only Specification (1) and each alternative specification with the same outcome variable. The purpose of this robustness check is to determine what is the singular association of an economic context (GDP, unemployment rate) or a cultural context (community size, share of foreigners or voting ultra right) on the attitudes of people embedded in a context. From all conducted likelihood-ratio tests only the two presented above were found significant.

Appendix 1: Definitions of Variables and Descriptive Statistics

Variable	Definition	Source	Obs	Mean	Std. dev.	Min	Max
Dependant variables							
Happy	Satisfied with current life	1	5,555	7.341	2.2654	0	10
Happy _negwide	0-4/5-10	1	5,555	0.0877	0.2828	0	1
Happy _negnarrow	0/1-10	1	5,555	0.0175	0.131	0	1
Happy _polar	0,10/1-9	1	5,555	0.2448	0.43	0	1
Prodemocratic values	Scale	1	5,187	9.4854	1.2142	0	10
Prodemo values_negwide	0-4/5-10	1	5,187	0.0114	0.1061	0	1
Prodemo values _negnarrow	0/1-10	1	5,187	0.0021	0.046	0	1
Prodemo values _polar	0,10/1-9	1	5,187	0.707	0.4552	0	1
Female working rights	Scale	1	5,373	5.6343	1.2193	1	7
Female rights_negwide	1-3/4-7	1	5,373	0.094	0.2918	0	1
Female rights_negnarrow	1/2-7	1	5,373	0.0073	0.0849	0	1
Female rights_polar	1,7/2-6	1	5,373	0.5414	0.4983	0	1
Explanatory variables							
Discrimination, subjective	never, seldom, frequently, no info	1	5,555	0.6693	1.6027	0	9
Health subjective	Scale 1-5	1	5,555	4.0083	1.0801	1	5
Labor market status	Perm, temp employed, edu / training, job-search, inactive	1	5,555	4.2513	1.3813	0	5
Educational attainment, respondent	No vocational, academic	1	5,555	1.0441	2.2484	0	9
Gender	male/female	1	5,555	0.5998	0.49	0	1
Marital status	Married/with partner, single, divorced/widowed, no info	1	5,555	1.9804	1.1702	1	4
Age	18-55	1	5,555	31.922	9.5807	18	55
Legal (refugee) status	In process, granted, denied, others, missing	1	5,555	1.0614	1.2517	0	9
German language proficiency		1	5,555	2.616	0.9456	1	5
Duration of move	Lower 31 days/more than 31 days	1	5,555	0.7876	0.7376	0	2
Edu attainment, parents	No voc, academic	1	5,555	0.8864	0.9118	0	3
Denomination	Christian, Muslim, Ohrer denomination, No denomination	1	5,555	3.9055	1.104	1	6
Housing	Shared housing /private flat	1	5,555	1.7123	0.6533	1	9
Year of immigration	2014/2017	1	5,555	2015	0.6293	2014	2017
Answering sensitive questions	yes/no	1	5,555	1.3825	0.5092	0	2
Country of origin	Afghanistan, Eritrea, Iraq, Syria	1	5,555	40.219	16.196	30	89
Urbanity	Population density	2	5,555	4.0443	1.6338	1	6
Unemployment rate	NUTS2	2	5,555	4.0475	1.2694	1.8	7.8
Share of foreigners	NUTS2	2	5,555	7.271	3.451	1.22	14.1
Nuts1		2	5,555	7.5244	4.4456	1	16
Nuts2		2	5,555	19.723	10.746	1	38

Source: 1	GSOEP V36 - IAB-SOEP-BAMF refugee subsample
Source 2	Destatis

Appendix 2: Deriving Cultural Factors (CH & LC) from WVS

We will quantify the cultural context as a source of impact on local clustering across the German regions by employing the Culture Based Development (CBD) notion of Cultural Entropy. CBD defines Cultural Entropy as the balance between the sub-components (vectors of attitudes) of type Living Culture (LC) and Cultural Heritage (CH) within the complex entity of local culture. The CBD Cultural Entropy is quantified by employing the Shannon Entropy formula for the percentage of CH and LC that the two entities take within the sum of LC and CH in a locality (see Tubadji 2024). Namely, we apply the formula:

$$\text{Cultural Entropy}_i = - [p1(CH_i)(\log_2(p1(CH_i))) + p2(LC_i)(\log_2(p2(LC_i)))]$$

where, for the set of local culture X in locality i:

- Cultural Entropy – the balance between CH and LC in the local culture in locality i

- p1 - share of the CH as an element of local culture in locality i

- $\log_2(p1(CH_i))$ is how uncertain it is that CH is valued in i (i.e. a transformation of the distribution of CH_i in local culture)

- p2 - share of the LC as an element of the local culture in locality i

- $\log_2(p1(LC_i))$ is how uncertain it is that LC is valued in i (i.e. a transformation of the distribution of LC_i in local culture)

The standard CBD approach to quantifying CH and LC in a locality entails implementation of principal component factor analysis (or similar approach, see Tubadji 2023). Through this method, the complexity of a multitude of mono-dimensional proxies of cultural attitudes in a locality is reduced to the most meaningful variation in present in the data that can be grouped in factor variables (clusters of closely varying mono-dimensional variables). A standard test for determining how many factor variables exhaust completely the meaningful variation in a set of mono-dimensional variables the Elbow test is employed, which visually shows how many factors are above the critical vertical line (as seen in Figure 4).

In this study, we use the World Value Survey data to obtain mono-dimensional proxies for cultural attitudes. Three sets of such proxies are used to obtain three alternatives of the Cultural Entropy measure.

Cultural Entropy 1 is obtained by selecting from WVS six indicators related to what people have reported important in life (these are transformed into dummy variables that the person has selected as important or very important respectively: family, friends, leisure, politics, work and religion. The principal component factor analysis produced factor loadings that group religion and politics in one factor and the remainder of mono-dimensional variables in a second factor. We labelled the former as CH and the latter as LC. The elbow test shows only these two factors as sufficiently explaining the variation in the set of our six WVS variables.

Cultural Entropy 2 is obtained by selecting from WVS 24 most disintegrated version of the Welzel Indices, related to authority, nationalism, devotedness, respect to religion, strength of religious belief, religious practice, respect and obedience and conformity to norms, trust in the army, trust in the police, trust in the court system, love for independence, appreciation for imagination, non-obedience, equal rights for women on the job, in politics and in education, liberal attitudes to homosexuality, abortion and divorce, practice of rights to voice ones opinion privately and publicly and institutionally. The principal component factor analysis produced as first factor a factor where nationalism and authority related variables have the strongest negative loadings and liberal attitudes to abortion and divorce the highest positive loadings, hence we label it LC factor. The second factor has mainly religion and voicing and voting variables loading on it which are institutionally related and hence we label this second factor the cultural heritage (CH) factor here. The elbow test shows that the first two factors most rapidly exhaust the biggest part of the variation and for parsimonious measurement we keep only these two factors.

Cultural Entropy 3 is obtained by selecting from WVS 30 indicators- namely the sum of the above listed six attitudes what is important and 24 most disintegrated version of the Welzel Indices. Like above, the principal component factor analysis produced as first factor a factor where nationalism and authority related variables have the strongest negative loadings and liberal attitudes to abortion and divorce the highest positive loadings, hence we label it LC factor. The second factor has mainly religion and voicing and voting variables loading on it which are institutionally related and hence we label this second factor the cultural heritage (CH) factor here. The elbow test shows that the first two factors most rapidly exhaust the biggest part of the variation and for parsimonious measurement we keep only these two factors.

The three tables showing the above-described corresponding mono-dimensional variables and their loadings on each factor for all three above-described cases of quantifying Cultural Entropy are available upon request from the authors. We have only offered here the word description for brevity. The WVS is available only on NUTS1 level, hence we estimate our hierarchical model alternatively on NUTS2 and NUTS1 level, as shown in Table 12.