# Scared Straight?
# Threat and Assimilation of Refugees in Germany*

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**Abstract**

This paper studies the effects of local threat on cultural and economic assimilation of refugees, exploiting plausibly exogenous variation in their allocation across German regions between 2013 and 2016. We combine novel survey data on cultural preferences and economic outcomes of refugees with corresponding information on German respondents, and construct a threat index that integrates contemporaneous and historical variables. On average, refugees assimilate both culturally and economically. However, while refugees assigned to more hostile regions converge to German culture more quickly, they do not exhibit faster economic assimilation. Our evidence suggests that refugees exert more assimilation effort in response to local threat, but that higher discrimination prevents them from integrating more quickly in more hostile regions.

**Keywords:** Refugees, cultural change, assimilation, identity
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# 1 Introduction

It is estimated that as many as 1 billion individuals will be forced to migrate because of climate change in the next three decades (United Nations, 2020). Recent years have also witnessed an exponential increase in the number of people fleeing their countries because of interstate conflict or civil wars (Becker & Ferrara, 2019). The assimilation of refugees in receiving countries has thus become one of the most pressing policy issues in the world.

In response to the inflow of refugees and to growing pressure from the native population, many European countries have introduced top-down integration policies that require migrants to abandon their cultural norms, such as restrictions on dressing habits of Muslim women (Abdelgadir & Fouka, 2020). While the effects of government interventions have been extensively evaluated in the literature (Bandiera et al., 2019; Fouka, 2020; Lleras-Muney & Shertzer, 2015), less is known about the impact of locals' attitudes on the integration of minorities, and refugees in particular. Yet, assimilation pressure exerted from the bottom-up by citizens at the local level may be at least as important as top-down government policies.

In this paper, we study the effects of local threat on refugees' cultural and economic assimilation. The relationship between threat and assimilation is *ex-ante* ambiguous. On the one hand, a more friendly environment might make it easier for refugees to integrate by facilitating inter-group interactions (Bailey et al., 2022). Similarly, lack of openness and forced assimilation may trigger backlash among immigrants, who try to preserve their own cultural norms (Abdelgadir & Fouka, 2020; Fouka, 2020; Dahl et al., 2021; Glover, 2019). On the other hand, natives' hostility may heighten refugees' incentives to signal allegiance to the nation and its values (Bisin & Tura, 2019; Fouka, 2019; Saavedra, 2021). Moreover, threat might increase uncertainty, in turn reducing the importance of maintaining traditions and inducing refugees to abandon their cultural norms (Giuliano & Nunn, 2021). However, threat-induced cultural convergence may not coincide with successful economic and social integration. For one, out-group members may use cultural convergence as a signaling device, changing only more superficial (and observable) norms. In addition, in areas with higher threat, the majority group may discriminate more against minorities for any level of effort exerted by the latter to assimilate.

We take these ideas to the data in the context of Germany, which received more than 1.6 million refugees between 2013 and 2018. To measure cultural convergence, we construct an index of cultural similarity between refugees and Germans by combining two datasets. First, we use the novel IAB-BAMF-SOEP Survey of Refugees – a longitudinal and nationally representative survey that collects information on socio-demographic characteristics as well as values, habits, and preferences of around 8,000 refugees. Second, we take preferences and

values of more than 30,000 locals from the German Socio-Economic Panel (SOEP).[1]

We define cultural similarity in stated preferences at the individual (refugee) level as follows. We select the questions that capture cultural preferences and are available in both surveys (risk attitudes, type and frequency of leisure activities, positive and negative reciprocity, interest in politics, trust, locus of control, and views over fairness in the society). All these cultural traits are strongly associated with political orientation, ideology, and social attitudes of SOEP respondents in our sample. They have also been shown to correlate with individual behavior and preferences, such as tax evasion, propensity to participate in protests, preferences for redistribution, and moral values (Bergolo et al., 2020; Cantoni et al., 2022; Enke, 2020), and to vary substantially across countries (Falk et al., 2018).

For each trait, we compute the distance between the answer provided by a refugee and that given by German residents at baseline. We then aggregate the question-specific difference using an index of Euclidean distance, which captures the shortest, unweighted distance between two points in the cultural space (Cha, 2007). From the same survey datasets, we also obtain self-reported measures of labor force participation and wages of both refugees and locals, which we use to analyze the economic convergence of refugees, relative to baseline economic outcomes of locals. We validate self-reported measures of economic assimilation using administrative data, linking survey respondents to administrative records that contain daily information on refugees' employment and wages.

Our empirical strategy exploits the quasi-random allocation of refugees that arrived at different points in time between 2013 and 2016 across German NUTS-2 regions with different levels of threat.[2] We measure local hostility using different proxies for anti-minority sentiments – from historical pogroms to the vote share of modern far-right, anti-immigrant parties to ethno-centrism of locals. Since local threat may be endogenous to refugees' inflows, all variables are measured before the outcomes of individuals in our sample are recorded. We combine these variables in a principal components index, which we validate using refugees' self-reported fears about xenophobia and feelings of being welcome in Germany.

To address concerns of selected migration of refugees after the initial assignment, we rely on an Intention to Treat (ITT) approach that measures refugees' outcomes and local threat in the region of assignment, rather than that of residence. We estimate a generalized difference-in-differences model that includes individual controls, district fixed effects, and interactions between year dummies and baseline district characteristics. We find that, on average, refugees assimilate both culturally and economically over time. However, these effects vary depending on the level of local threat.

[1] Throughout the paper, we use the term "local" for any German non-refugee individual.

[2] In Germany, there are 401 districts (which correspond to NUTS-3 regions), or *Kreisfreie Städte*, with an average of 180,000 inhabitants. Germany has 38 NUTS-2 regions and 16 NUTS-1 regions (Federal States).

Consistent with refugees responding to local pressure, cultural convergence is faster in regions with higher threat. Comparing a refugee allocated to a region at the 75th percentile of the distribution of the threat index to one allocated to a region at the 25th percentile, the former is 73% closer than the latter to the stated preferences of German respondents, after one year. Also in line with threat-induced assimilation, refugees who experience more anti-immigrant demonstrations in the region of assignment during the first months since arrival exhibit higher cultural similarity to locals in subsequent years. Yet, despite the faster cultural convergence, refugees assigned to areas with higher threat do not display more rapid economic assimilation.

We also consider a set of "core" values, such as attitudes towards women's rights, support for democracy, and religiosity. Since we are unable to measure the corresponding preferences for locals, we consider absolute (rather than relative) cultural change. We find that refugees assigned to more threatening areas are more supportive of democracy and decrease attendance of religious events over time. At the same time, threat does not influence gender norms and the importance of religion among refugees.

An important concern with the interpretation of our results is that local threat might be correlated with other variables that shape the assimilation trajectory of refugees. To assuage this possibility, in our preferred specification, we interact year dummies with baseline district-level: unemployment, population density, and refugee share. These are three key variables that might be related to both threat and the allocation of refugees on the one hand and might affect refugees' assimilation on the other. We also document that results are unchanged when interacting year dummies with additional baseline district characteristics, such as fiscal capacity, supply of teachers, and availability of schools. This allows districts of assignment to be on differential trends depending on their resources to accommodate refugees. Finally, we run a horse-race between threat and other local variables, such as the size of ethnic enclaves, proxies for local economic structure, and measures of cultural distinctiveness. Even when controlling for these other forces, local threat has a strong effect on refugees' cultural convergence.

We provide evidence that our results are not driven by *ex-ante selection* on the side of authorities, by *ex-post sorting* on the side of refugees, or by selected migration among locals. In particular, our findings are unlikely to be influenced by: *i*) changes in the composition of refugees – e.g., with individuals who are more likely to assimilate moving to Germany over time; *ii*) changes in assignment policies over time – e.g., refugees being assigned to places with different cultural and economic characteristics and threat levels; and, *iii*) selective internal migration of either refugees or locals, selective survey attrition, or changes in German cultural preferences over time.

We also verify that results are robust to: using alternative definitions of cultural similarity and threat (including cultural similarity and threat index measured at endline); dropping potential outliers; accounting for spatial correlation in the error term; excluding individuals interviewed multiple times to address concerns of bias in difference-in-differences designs with heterogeneous treatment effects (De Chaisemartin & d'Haultfoeuille, 2020; Goodman-Bacon, 2021); and, instrumenting threat in the region of residence with that in the region of assignment.

As anticipated above, one interpretation for our results is that local threat induces refugees to exert more effort to learn and adopt the culture prevailing in the host country. Yet, locals living in more hostile regions may discriminate more against minorities, hindering the successful assimilation of the latter. This is consistent with assimilation being a two-sided process (Fouka et al., 2022). Out-group members can choose if and how much effort to exert in order to learn local norms and culture, but such effort does not lead to successful assimilation, unless locals accept refugees into their group. Interpreting self-reported cultural preferences as a measure of assimilation effort, our findings suggest that threat-induced pressure leads out-group members to exert more effort. Yet, the same level of effort is less likely to translate into successful assimilation (proxied for by economic outcomes) in more hostile environments. Despite higher effort, refugees are not more likely to be employed or to have higher wages in areas where the threat environment is stronger. We provide different pieces of evidence consistent with our interpretation.

First, we find that threat increases refugees' assimilation only along margins where cooperation with locals is not needed (e.g., attending voluntary integration courses). Relatedly, refugees assigned to areas with higher threat are less likely to have interactions with locals, either as co-workers or as customers. Second, we document that threat-induced convergence is stronger among more vulnerable refugees, such as women, less educated individuals, and families with children. Third, we show that the effects of threat are stronger in places where one's ethnic enclave is smaller, and refugees may thus feel less protected from natives' hostility. Finally, in line with the literature on the historical determinants of xenophobia (Cantoni et al., 2019; Voigtländer & Voth, 2013), we find that the inflow of refugees can "re-activate" latent anti-minority sentiments. Specifically, we provide evidence that the increase in the refugee share induces locals in high threat regions to engage more often in endogamous mating and to hold more negative views towards refugees.[3]

Taken together, our results indicate that, even though hostility may increase the extent

[3]We also test whether anti-minority sentiment is associated with denser social networks and association density, as shown in the German historical context (Satyanath et al., 2017). Using data from Twitter and from the presence of local (pro-refugees) NGOs, we do not find evidence that faster cultural assimilation in high-threat regions stems from integration activities organized by locals (or, non-profit organizations).

to which minorities adopt local culture in the short-run, this does not translate into faster or more successful assimilation. Furthermore, it is unclear whether threat-induced cultural convergence is long-lasting. In fact, threat may eventually discourage minorities from exerting effort to assimilate, leading to lower, rather than higher, assimilation in the long-run. Also, and importantly, our analysis does not consider the mental, physical, and social costs suffered by individuals facing hostility (Benner et al., 2018; Graeber & Schikora, 2021; Schilling & Stillman, 2021; Walther et al., 2020).

Our paper is related to different strands of the literature. First, we contribute to the literature on assimilation and cultural transmission. Economists have analyzed immigration-induced changes in preferences of the local population (Bazzi et al., 2021; Boelmann et al., 2021; Bursztyn et al., 2021; Giuliano & Tabellini, 2020), the influence of emigrants on the cultural dynamics of the origin community (Barsbai et al., 2017; Rapoport et al., 2021), the evolution of immigrants' preferences (Abramitzky et al., 2020a; Fernández & Fogli, 2009), and the effects of forced migration on refugees' human capital investment (Bauer et al., 2013; Becker et al., 2020).

Second, our analysis speaks to the literature on the determinants of attitudes and norms. In the context of migration, many of these papers emphasize the persistence of cultural preferences and their transmission across generations (Bisin et al., 2021; Desmet & Wacziarg, 2021; Giuliano & Nunn, 2021; Spolaore & Wacziarg, 2016). We complement these works by focusing on refugees in the German context, leveraging rich survey data to measure preferences of both minorities and majority group members. Our findings shed light on one specific determinant of cultural change (i.e., local threat) and on the malleability of preferences and attitudes in the short-run.

Our paper is also related to the vast literature on the economic integration of refugees in high-income countries (see Becker & Ferrara, 2019, and Brell et al., 2020, for recent reviews). Closest to our paper, Aksoy et al. (2021) use data from the Survey of Refugees to show that more favorable labor market conditions and more open attitudes among locals promote the economic and cultural integration of refugees. We complement their findings in three ways. First, we develop a comprehensive measure capturing immediate threat, rather than attitudinal openness, faced by refugees. Second, our empirical strategy relies on weaker identifying assumptions. Third, we focus on the change in refugees' assimilation, rather than on its level. These differences may explain why our findings on cultural assimilation diverge from those in Aksoy et al. (2021).[4]

Finally, our work complements the literature on the causes and consequences of the post-

[4]As explained in Section 4, we rely on the consistent allocation of refugees across districts over time. Instead, Aksoy et al. (2021) exploit the (quasi-random) allocation of refugees across districts at a given point in time.

2015 refugee inflow to Germany and Europe (Bahar et al., 2022; Battisti et al., 2021; Busch et al., 2020; Deole & Huang, 2020; Gehrsitz & Ungerer, 2022; Hangartner et al., 2019; Hilbig & Riaz, 2022; Martén et al., 2019).

# 2 Background: Refugee Migration to Germany

Germany has been one of the main destinations for refugees in Europe. Between 2015 and 2018 alone, a total of 1.6 million asylum applications were filed in Germany, amounting to over 40% of all applications in the European Union during this time (Eurostat, 2021). The surge in asylum applications followed the eruption of the civil war in Syria and the growing threat of the so-called Islamic State in Iraq. Starting in 2011, an increasing number of refugees fled to neighboring countries, moving westward to seek protection in Europe. The movement of hundreds of thousands of refugees from Syria and Iraq through Turkey and the *Balkan Route*, crossing Greece, Serbia, Croatia, or alternatively Hungary, rippled into an even larger and more diverse movement of people, including asylum seekers from Albania and Kosovo.

The number of asylum applications in Germany peaked in late 2015, following Angela Merkel's highly contested decision to admit refugees that were stranded in Hungary (Figure A.1). This decision was a deviation from the Dublin Regulation, which assigns the responsibility of administering an asylum request to the country of first-entry. However, the regulation was effectively (though not officially) abandoned before September 2015, as registration and administrative capacities in Italy and Greece ached under the immigration pressure, and most refugees desired to move to Northern Europe. In order to curb the number of refugees, in March 2016, the European Union established a treaty with Turkey that encouraged stricter controls by Turkish authorities at its Western shores. Turkey agreed to take back refugees from Greece, and resettle local refugees in the European Union. The treaty, in combination with the closing of the Southern Hungarian border, led to a steep decline in asylum applications in Germany, which have remained relatively low (at pre-2014 levels) since then.[5]

Despite early warning signs, such as increasing numbers of refugees in Iraq and Syria's neighboring countries and growing refugee inflows across Europe, German authorities remained ill-prepared for the upcoming influx. The accommodation of hundreds of thousands of refugees within a few months proved to be a major challenge for Germany. The main tool for the distribution of refugees across States (*Bundesländer*) was the so-called *Königsteiner Schlüssel*, which allocated refugees according to a State's economic capacity (tax revenues)

[5]Yet, Germany has received more than 900,000 Ukrainian refugees since February 2022 (UNHCR, 2022).

and population. States themselves could then distribute refugees within their districts, following independent but similar criteria. Focusing on 2016, Figure A.2 shows that the local presence of refugees is consistent with the distribution that would have arisen under the the assignment through the *Königsteiner Schlüssel*.

The German government sought to allocate refugees depending on the local availability of housing, taking into account their demographic characteristics (such as age, gender, family status, and country of origin). However, the pace of refugee arrivals left little room either for one-on-one conversations with assignment officers or for in-depth analyses of refugees' profiles. Within a short period of time, the available accommodations were filled up, and local authorities had to rely on alternative solutions, such as vacant houses, empty hotels, old military barracks, schools, and improvised container colonies and tents (Baier & Siegert, 2018).

Beyond the initial assignment to accommodations within states, refugees had the ability to self-relocate under certain circumstances. Those who were still in the asylum application process or who had already been rejected were not allowed to move within the first three months of stay in Germany. Many of the rejected asylum applicants receive a special status, by which they are not officially refugees but whose stay in the country is tolerated (*Duldung*). Until August 2016, accepted applicants as well as persons with *Duldung* and pending applications that passed the three month mark were allowed to move freely across Germany. However, during the summer of 2016, lawmakers passed the *Integration Act*, restricting the free movement across states even for asylum seekers with approved status for the first three years.[6]

In general, asylum seekers whose application has not yet been processed have access to the labor market after a waiting period of three months, except if they come from a so-called safe country of origin. The same period applies to persons with tolerated status, i.e., individuals whose asylum application has been rejected but for whom it is currently not possible to leave the country. The work permit is issued only for a specific job after review by the authorities. Instead, persons with approved asylum status can enter the labor market without any restriction.

[6]Six out of sixteen states tightened the law further, prohibiting refugees to move out of the districts they were initially assigned to, unless they could earn their own living.

# 3 Data and Measures of Threat and Assimilation

## 3.1 Data Sources

**The German Socio-Economic Panel.** The German Socio-Economic Panel (SOEP) is a large, nationally representative longitudinal study that surveys around 15,000 households and about 30,000 individuals every year since 1984, mostly in face to face interviews. The SOEP includes rich information on demographics, district of residence, socio-economic status, and migration background of respondents.[7] In our baseline analysis, we consider all local residents (other than refugees, i.e., respondents of SOEP-Core) between 18 and 66, regardless of their nativity.[8]

**The refugee survey.** We complement the SOEP with waves 1 to 3 (survey years 2016-2018) of the IAB-BAMF-SOEP Survey of Refugees to measure refugees' preferences over time. This is a longitudinal, representative survey of refugees, asylum seekers, and their family members in Germany (Brücker et al., 2016). The survey is conducted jointly by the Institute for Employment Research (IAB), the Research Center of the Federal Office of Migrants and Refugees (BAMF FZ), and the SOEP at the German Institute for Economic Research (DIW Berlin). The target population is composed of individuals arrived as asylum seekers in Germany between January 1, 2013, and December 31, 2016, irrespective of their current legal status. The total sample includes about 8,000 adult respondents, who were surveyed up to three times between 2016 and 2018.[9] As for locals, we restrict attention to individuals between 18 and 66. Additionally, we exclude from the sample refugees that have been in the country for more than 6 years (less than 1% of the sample) as of the latest survey year in 2018. We impose this restriction because these individuals arrived well before the 2015 refugee crisis, and are thus not comparable to the refugee population considered in our paper.

The main questionnaire includes more than 400 questions regarding migration, employment and education history, socioeconomic and demographic characteristics, health status, measures of social and political integration, as well as values and attitudes. This data is complemented with a questionnaire conducted at the household level that asks questions about housing, living conditions, and welfare benefits. Crucially for our purposes, the refugee survey is designed to closely match the questions in the SOEP, and both sample and the interview process are similar between the two surveys. This feature ensures the comparability

[7] We use data version 36, including years 1984-2019 (SOEP, 2020). For more details on sampling, fieldwork, data structure, and content of the SOEP, we refer to Goebel et al. (2019).

[8] The age restriction is imposed to focus on working age population. Results are robust to omitting this restriction. Results are also unchanged when restricting attention to German-born locals to define economic and cultural variables.

[9] See Kühne et al. (2019) for more details.

of the two surveys – a key condition to study differences in values and attitudes between refugees and locals.

**Additional datasets.** In Appendix C.2, we present additional datasets used in the analysis, including a linked individual dataset that matches survey respondents to administrative data on daily employment and wages (Keita & Trübswetter, 2020). We also collect several variables from multiple sources to construct the threat index, as explained in the next section.

## 3.2 Measurement

**Threat environment.** We define local threat using different variables measured at the NUTS-2 region level. First, we collect historical data on pogroms and violence against Jews from Voigtländer & Voth (2012), and the 1933 vote share of the Nazi-party from Falter & Hänisch (1990). Second, we obtain more recent data on political attitudes: the 2013 vote share of the far-right, anti-immigrant National Democratic Party (NPD) from the Federal Elections Office (Bundeswahlleiter, 2020), and the frequency of marches organized by the far-right political groups between 2005 and 2012 from Kanol & Knoesel (2021). Third, we use attacks against mosques between 2001 and 2011 from Colussi et al. (2021). Finally, we measure locals' ethno-centrism by combining anti-immigrant and anti-diversity attitudes from ALLBUS (2021) and an inverse measure of "openness" – a sub-dimension of the Big-5 personality traits associated with ethnocentrism from the SOEP.[10] All components of the threat index, described together with their sources in Table C.1, are measured before the inflow of refugees. This reduces concerns of endogeneity, since natives' hostility may respond to refugee migration. Yet, in Appendix B.7, we replicate the analysis using contemporaneous measures of threat.

In order to measure threat in a single index, we calculate the first principal component of all measures just described. We plot the threat index across NUTS-2 regions in Figure A.3, both unconditional (left panel) and conditional on state fixed effects (right panel). Table C.2 reports the correlation between the various components of the index. Both the index and its components display significant regional variation, and the individual dimensions seem to be geographically correlated with each other. Overall, threat levels are most pronounced in Eastern Germany – a pattern especially apparent for the right-wing vote. This is in line with the literature connecting a history of socialism with right-wing attitudes (Acemoglu et al., 2022; Lange, 2021).

We validate our measure of threat in Figure 1. In the left panel, we report the residual

[10] ALLBUS (The German General Social Survey) is a survey conducted every two years since 1980, which elicits attitudes and behavior of residents. To measure locals' attitudes, we pool survey years 2008, 2010, and 2012. Research in social psychology found a consistent association between openness to experience and ethnocentrism. See, for instance, McCrae (1996), Butler (2000), and Jost (2006).

bin-scatterplot for the relationship between a self-reported measure of fears about xenophobia that ranges from 1 to 3, with higher values reflecting more concerns, expressed by refugees (y-axis) and the threat index (x-axis).[11] The figure reveals that refugees assigned to regions with a higher threat index are more likely to report concerns about xenophobia. The right panel confirms these patterns using refugees' answer to the question of whether they feel welcome in Germany (on a 1 to 5 scale, with higher numbers referring to more inclusive feelings). Figure A.4 shows that such relationship holds for both women (Panel A) and men (Panel B), even though it is stronger for the former than for the latter, suggesting that women may be responding more than men to threat. We return to this idea in our analysis, below.

**Cultural traits.** To measure refugees' cultural convergence, we construct a measure of cultural proximity between each refugee and all (non-refugee) Germans in the SOEP. The cultural dimensions used in our analysis arise from the overlapping questions in the refugee survey and in the SOEP. We consider the 8 questions that are systematically available for both locals and refugees and that, in our view, are best positioned to capture cultural preferences and social norms. These are: risk attitudes, negative and positive reciprocity, frequency of different types of leisure and cultural activities (sports, movies, restaurants, opera, etc.), interest in politics, locus of control, generalized trust, and views over fairness in society. Table C.3 reports all questions, together with the exact wording and the range of possible answers.[12]

In Table A.1, we present the correlation between each of the traits considered in our analysis and several proxies for political orientation, cultural and social attitudes, and preferences for redistribution and altruism of SOEP non-refugee respondents.[13] Panel A documents that, in most cases, there is a strong correlation between the cultural traits included in our analysis and political preferences of individuals interviewed in the SOEP, and that the patterns are consistent with the literature (Block & Block, 2006; Carney et al., 2008; Littvay et al., 2011).[14] A similar picture emerges from Panels B and C, which consider cultural preferences (e.g., support for same-sex marriages, views towards gender roles, and religiosity) and altruism and preferences for redistribution, respectively. These results are again consistent with

[11] The corresponding regression partials out survey year fixed effects, months since arrival, and individual characteristics (gender, age, age squared, kids born before arrival in Germany, country of origin, marital status and location of partner as well as work experience and education upon arrival).

[12] In Appendix B, we verify that results are robust to including additional survey questions (reported in Table C.4).

[13] See Table C.5 for the exact wording of each variable. In Table A.1, we adjust standard errors to account for multiple hypotheses testing using the procedure in Clarke et al. (2020), Romano & Wolf (2016), and Romano & Wolf (2005a,b).

[14] For instance, higher levels of positive reciprocity and trust are associated with higher satisfaction in German democracy and with stronger concerns about climate change. Individuals who report higher negative reciprocity are more likely to have right-leaning political preferences and to be worried about immigration. As expected, respondents that are more interested in politics are more likely to have participated in recent elections. They are also less worried about immigration, more concerned about climate change, and more likely to hold a left-leaning political ideology.

the literature (Falk et al., 2018).

Overall, Table A.1 suggests that the traits we focus on are correlated with key political, cultural, and social preferences. This is not surprising, since they have also been shown to predict political and economic behavior in a variety of settings. For instance, Cantoni et al. (2022) document that risk preferences and positive reciprocity are determinants of protest participation. Bergolo et al. (2020) show that lower locus of control and higher altruism are positively correlated with tax evasion. Littvay et al. (2011) and Kam (2012) find that political participation is increasing in self-efficacy and risk tolerance, respectively.[15]

**Defining cultural similarity.** Different statistical measures can be used to capture distance, entropy, or divergence (Cha, 2007). Most of these are derivatives of the Minkowski norm, which is defined as $D_{mink}(X,Y) = \sqrt[p]{\sum_{i=1}^{n} |x_i - y_i|^p}$, where $X$ and $Y$ are two independent probability density functions. The most frequently used measure of cultural distance, at least within economics, is the Euclidean distance, which belongs to the group of geometric distances (Alesina et al., 2017; Bertrand & Kamenica, 2018; Rapoport et al., 2021). Intuitively, it captures the shortest, unweighted distance between two points in the cultural space.[16]

Following the literature, we use the Euclidean distance to capture the cultural proximity between an individual refugee and all (non-refugee) residents. For each of the 8 questions in Table C.3, we first calculate the pairwise differences between a refugee and all locals. Then, we square those differences, take the mean at the refugee level over all locals, and calculate the square root of this term, so as to obtain the Euclidean pairwise distance between an individual refugee and all locals. Finally, we average over all questions, and invert this term to get a cultural similarity index (CSI).

While locals' preferences may change in response to refugee inflows, making the CSI less accurate, we want to prevent our proxy for cultural convergence from being influenced by Germans moving closer to refugees. Therefore, we take locals' responses to a specific question in the year before the large influx of refugees starting in 2014. When a question was not asked in 2013, we use the closest observation year possible. Appendix B verifies that there is no correlation between any of the dimensions we include in the index (for locals) and the inflow of refugees over time, regardless of the level of threat prevailing in the region. It also documents that results are unchanged when measuring locals' preferences at endline, and when defining cultural similarity in different ways. We illustrate the average cultural similarity between refugees and locals across regions in Figure A.5.

We complement the CSI using a set of questions that were asked in the survey of refugees

[15] In our sample there is a negative, albeit only marginally significant, relationship between risk tolerance and the probability of having voted in parliamentary elections.

[16] Specifically, the Euclidean Distance is part of the Minkowski family with $p = 2$.

but are not available for locals. Specifically, in Section 5.3, we examine the evolution of refugees' views towards gender equality, support for democracy, and religiosity in absolute terms. Appendix C.2.2 provides a detailed description of each variable.

**Economic assimilation.** We measure economic assimilation by subtracting the self-reported employment status (either zero or one) of each refugee from the baseline average employment rate of locals. For individuals who are employed, we replicate this procedure for earnings, taking the absolute value of the difference between the wage earned by the refugee and locals' median wage.[17] For the sub-sample of employed refugees, we can link survey information to administrative employment data, addressing potential biases stemming from misreporting of employment status by refugees. Therefore, we construct the same measures of economic assimilation using this data.

## 3.3 Descriptive Statistics

Table A.2 reports the summary statistics for the main variables and the characteristics of refugees (Panel A) and locals (Panel B), for the full sample and separately for regions above and below the median value of threat (-0.63). On average, the cultural distance between refugees and locals is -1.91, with very similar values and distributions in high and low threat regions. The average refugee in our sample has been in Germany for 29 months; again, this number is similar in high and low threat regions. On average, the employment gap between locals and refugees is 51%, and, among those employed, refugees earn 810 Euros less than locals.

Table A.2 also presents summary statistics for additional variables considered in our analysis.[18] Along all dimensions, refugees assigned to low-threat regions tend to report slightly lower values. Consistent with the more formal evidence documented below, refugees seem to integrate in the host region quickly: more than 50% of the individuals in our sample are or have been attending integration courses, and 14% of those who are in a relationship have a partner who was born in Germany at the time of interview. Moreover, according to the assessment of the interviewer, refugees' proficiency in German tends to be intermediate-level. More than three in four refugees in our sample come from Syria, Afghanistan, or Iraq; Africa and the West Balkans account for another 22% of respondents (not shown). Refugees are more likely to be male and younger than locals, and only about a third of them arrive with a secondary school leaving certificate (as compared to 87% of locals). About 15% of locals have a migration background, with the largest group coming from Poland.[19]

[17] Since refugees' employment and wages significantly lag those of locals (Brell et al., 2020), results are very similar when focusing on absolute, rather than relative, convergence.

[18] Table A.3 displays more detailed summary statistics, including each dimension of the cultural similarity index.

[19] Given the high share of non-native local residents, Appendix B replicates the analysis defining the cultural similarity index

Panel C reports district-level controls used in the main analysis as well as the (regional) threat index. High threat regions are characterized by higher unemployment, lower population density, and a lower share of refugees. Mechanically, the threat index is higher in regions above the median. However, as shown in Table C.6, its components display substantial variation. Somewhat surprisingly, historical variables (1920s pogroms and 1933 NSDAP vote share) are not higher in regions where the index is higher. In fact, pogroms are lower in those regions where the overall threat index is above the median. A similar pattern emerges for 2001-2011 attacks against mosques, implying that the variation behind the threat index does not load onto either historical anti-Semitic attitudes or recent attacks against mosques. This is consistent with the decomposition of results presented below, where we show that neither historical threat variables nor attacks against mosques have an effect on cultural convergence. Instead, natives' attitudes towards refugees from ALLBUS (2021), the 2013 NPD vote share, and participation in far-right marches are all higher in regions with the threat index above the median.

# 4 Empirical Strategy

## 4.1 Estimating Equation

To study how local threat influences refugees' cultural and economic assimilation with each additional month spent in Germany, we estimate:

$$Y_{idrt} = \gamma_d + \gamma_t + \beta_1 MSA_{it} + \beta_2 MSA_{it} \times Threat_r + X'_{it} + Z'_{dt} + Q_{it} + \epsilon_{idrt} \tag{1}$$

where $Y$ is either cultural or economic assimilation (relative to the German population at baseline) of refugee $i$ in district $d$ and survey year $t$; $MSA$ refers to months since arrival of the refugee; and, $Threat$ is the threat index for region $r$ described in Section 3.2. The key regressor of interest is the interaction term between $MSA$ and threat. The coefficient $\beta_2$ captures the differential effect that each additional month has on the assimilation of a refugee when spent in a region with a different level of threat. Positive values of $\beta_2$ indicate that refugees converge faster (economically or culturally) in areas with higher threat.

In our preferred specification, we control for: *i*) district fixed effects, $\gamma_d$, which absorb any district-specific, time invariant characteristic, including the threat index (defined at the NUTS-2 region); *ii*) baseline district level variables (unemployment rate, population density, and share of asylum seekers) interacted with year dummies, $Z'_{dt}$; *iii*) individual characteristics

by restricting attention to locals born in Germany.

(gender, age, age squared, country of origin, and marital status, dummy for children living in the household born before arrival, work experience, and education upon arrival), $X'_{it}$; and, *iv*) refugee specific time-varying dummy variables, $Q_{it}$, to account for compositional changes in the questionnaire and refugees' responses (or missing values). The latter control guarantees that we compare refugees that answered the same set of attitudinal questions over time.

We use the region of assignment – rather than the region of residence – as the location of treatment, thereby implementing an intention to treat (ITT) approach.[20] Standard errors are clustered at the person-level to account for the fact that some refugees are surveyed repeatedly, following the sampling-based clustering approach proposed by Abadie et al. (2017).[21]

## 4.2 Threats to Identification

The key identifying assumption behind our empirical strategy is that the allocation of refugees across German regions did not change over time in a way that was correlated with: refugees' assimilation trajectories; and, threat in the region of assignment. This would be violated in the presence of *ex-ante* selection of refugees across regions. For instance, officials might have become better able to match refugees to regions on the basis of their similarity to German culture in a way that is correlated with local threat. Alternatively, due to the rising number of asylum seekers, refugees arriving later might have been assigned to areas with more sluggish labor markets and with higher levels of hostility.

A second concern with the empirical strategy is that local threat may be correlated with other district or region level variables that might influence the assimilation trajectory of refugees. For example, regions with higher levels of threat have somewhat higher unemployment and population density (see also Table A.2). Even though district fixed effects absorb level-differences in these and other characteristics, these variables, rather than threat, may put refugees on different assimilation trajectories.

A third issue with identification is the possible *ex-post* sorting of either locals or refugees. The ITT approach addresses the potential relocation decision of refugees (e.g., away from more threatening regions and into more welcoming ones). However, it does not deal with the fact that locals with varying degrees of openness may selectively move away from regions that were assigned a higher number of refugees, and that also varied in their level of threat. Even

[20] In Appendix B, we show that results are similar when estimating 2SLS regressions, using threat in the region of assignment as instrument for threat in the region of residence.

[21] Results are robust to clustering standard errors at the district level, and to using Conley (1999) adjusted standard errors to account for potential spatial correlation in the error term (Appendix B).

if we define local threat and cultural similarity at baseline, locals' migration may nonetheless influence the trajectory of refugees' assimilation by changing the local environment.

In Appendix B, we describe in detail the exercises performed to corroborate the validity of our empirical strategy, but we preview the most important ones here. First, we address concerns about *ex-ante* selection. We document that the pre-entry characteristics of refugees, including baseline cultural similarity, assigned to different regions do not change over time. This holds both for the full sample and for regions above and below the median of the threat index (Tables B.1 and B.2).

Second, to address the possibility that threat may be correlated with other local variables, in the preferred specification, we interact year dummies with baseline district: unemployment, population density, and refugee share. In addition, we check that results are unchanged when interacting year dummies with other baseline district-level characteristics (e.g., tax revenues, supply of teachers, and availability of schools) that might be correlated with local threat and have a direct impact on refugees' integration (Table B.3).[22] This is important because it allows districts of assignment to be on differential trends, depending on predetermined variables, such as the availability of teachers, fiscal capacity, and housing supply, which may influence both the allocation of refugees and the assimilation of the latter. Relatedly, we conduct a horse-race between local threat and several other variables (e.g., size of ethnic enclaves, local economic structure, and cultural distinctiveness) that might impact refugees' assimilation as they spend more time in Germany and may be correlated with local hostility (see also Appendix D.2).

Third, we deal with potential *ex-post* sorting. Even though the ITT design already deals with this concern for refugees, we directly examine the possibility that the latter selectively moved across regions during our sample period. Reassuringly, there is no evidence of either cultural or economic selection on the side of refugees (Figure B.1). Exploiting the residency obligation requirement introduced in the summer of 2016, which restricted a subset of refugees to move freely across Germany, we also verify that our estimates are very similar for refugees subject to the policy and those who were not (Table B.4). Furthermore, we check that higher levels of threat are not associated with differential out-migration of either refugees (as they spend more time in Germany) or locals (in response to refugee inflows), and that there is no selective attrition among refugees (Tables B.5 and B.6)

We summarize all other robustness checks in Section 5.4 after presenting our results.

[22]Recall that in our preferred specification we already allow districts to be on differential trends according to baseline: unemployment, population density, and refugee share.

# 5 Threat and Assimilation

## 5.1 Main Findings

Before focusing on the relationship between local threat and assimilation, we examine the trends in cultural and economic convergence of refugees in the raw data. Figure 2 plots the relationship between months since arrival and both cultural similarity (blue, solid line) and economic assimilation (green, dashed line). The two lines suggest that, on average, refugees assimilate culturally and economically over time. We present results from the regression analysis in Table 1.[23] In column 1, we regress the CSI (Panel A) and refugees' relative employment (Panel B) against months since arrival (MSA), individual controls, and fixed effects for survey-question composition, district, and survey year. In both cases, the coefficient on MSA is positive and statistically significant, confirming the pattern displayed in Figure 2.[24]

To interpret the magnitudes of our estimates, we ask when the average cultural similarity between a refugee and a local would equal that between two non-refugee Germans. We calculate the CSI between all locals using the pairwise difference between them. This is, on average, -1.38: as expected, lower (in absolute value) than the distance between refugees and locals (-1.91). According to the coefficient in column 1, refugees close approximately 3% of this gap in one year. For economic assimilation, our estimates imply that one extra year in the region of assignment reduces the employment gap by 9 percentage points (or, about 18% relative to the mean).

Next, we turn to the role of threat. On the one hand, a more open environment might make it easier for refugees to integrate, by facilitating social and economic interactions Bailey et al. (2022). Moreover, lack of openness may inhibit assimilation or even cause backlash, leading refugees to preserve their own cultural norms (Abdelgadir & Fouka, 2020; Fouka, 2020). On the other hand, local hostility may increase incentives to assimilate among minorities. Refugees assigned to regions with higher threat may feel stronger psychological pressure and might be more worried about their safety or that of their relatives. As a result, they may abandon their own culture more quickly (Fouka, 2019; Saavedra, 2021). In addition, if threat increases uncertainty, the returns to maintaining cultural norms may decline (Giuliano & Nunn, 2021), thereby fostering cultural convergence. However, assimilation is not a deterministic process, and locals living in more hostile regions may be more likely to discriminate against out-group members, even when the latter exert higher levels of effort. Hence, a higher desire to assimilate might not translate into successful integration.

In column 2 of Table 1, we test these ambiguous predictions by augmenting the speci-

[23] Coefficients and standard errors are multiplied by 100 for readability.

[24] Restricting attention to refugees who are employed, Table A.6 documents that similar patterns hold for wages.

fication in column 1 with the interaction between MSA and the threat index described in Section 3.2.[25] Starting from Panel A, we observe that the coefficient on MSA is barely affected, while that on the interaction term is positive and statistically significant. That is, refugees assigned to more hostile regions display faster cultural assimilation as they spend more time in Germany. Columns 3 to 5 verify that results are unchanged when interacting year dummies with three key district-level variables that might be correlated with threat and influence refugees' assimilation: the local unemployment rate (column 3), population density (column 4), and the share of refugees (column 5). In column 6, we include all variables together. Reassuringly, coefficients are barely affected and remain very close to those in column 2.[26] The effects are quantitatively large. A refugee assigned to a region in the 75th percentile of the threat distribution increases her speed of assimilation by 73% compared to a refugee in the 25th percentile.[27]

Results for economic assimilation (Panel B) are rather different: while the coefficient on MSA remains positive and statistically significant, that on the interaction between MSA and threat is close to zero and not statistically significant.[28] One potential concern is that our findings might be influenced by desirability bias or by mis-reporting among refugees, which may be correlated with both threat and time spent in Germany. To address this issue, we link the refugee survey to administrative data, which records both employment and wages (see Appendix C.2.1). Reassuringly, results are unchanged when using SOEP-Record-Linkage data (Table A.7). While we cannot repeat this exercise for cultural convergence, these patterns suggest that our estimates are unlikely to suffer from social desirability or other sources of reporting bias.

## 5.2 More Evidence on the Role of Threat

Results in Table 1 suggest that local threat increases the cultural – but not the economic – assimilation of refugees. This is consistent with refugees responding to local threat by exerting more effort to adopt local culture, possibly because of fear. At the same time, in more hostile regions, locals might discriminate more against refugees, thereby limiting their successful economic assimilation. We return to this idea in Section 6 below. In what follows, we provide additional evidence on the relationship between local threat and assimilation.

**Heterogeneity by months since arrival.** In Figure A.6, we examine the trends of cultural

[25] The main coefficient on threat is absorbed by the district fixed effects.

[26] In Appendix B, we show that results are robust to including more controls (Table B.3). Table A.4 replicates Table 1, Panel A, by presenting coefficients on all controls.

[27] This number is obtained by multiplying the coefficient on the interaction in column 6 (0.082) by the inter-quartile range of the threat index (0.45), and then scaling this by the coefficient on MSA (0.129).

[28] Table A.5 replicates Table 1, Panel B, by presenting coefficients on all controls. Table A.6 shows that results are unchanged when focusing on wages.

(left panel) and economic (right panel) convergence by arrival cohorts. We replicate the preferred specification by replacing the continuous measure of MSA with 12-month interval dummies, using the 0-12 months group as omitted category. To ease the visualization of results, rather than interacting MSA dummies with the threat index, we split the sample between refugees assigned to regions above (green squares) and below (blue dots) the median.

For refugees assigned to regions with threat above the median, the increase in cultural similarity is evident already after the first year. Since then, cultural convergence progresses, though slowly, reaching a plateau after 48 months. A very different picture emerges when focusing on refugees assigned to regions with threat below the median. For this group, cultural convergence does not take place until the fourth year since arrival: only individuals that spent 48 months or more in Germany are somewhat more similar to locals, relative to refugees that spent less than 12 months in the country, although the point estimate is not statistically different from zero.

Turning to economic assimilation, instead, we note that refugees assimilate at a very similar pace across regions, suggesting that faster cultural convergence does not coincide with more successful economic integration. Moreover, differently from cultural convergence, economic assimilation does not slow down after the first two years, and refugees (in both types of regions) keep making steady progress over time.[29]

**Exposure to far-right demonstrations.** In Appendix D.1, we test whether refugees' cultural convergence is influenced by episodes of hostility occurring in the first months since arrival, when refugees might be more vulnerable to natives' harassment. We compute the number of far-right demonstrations that occurred in the region of assignment in the first months since a refugee's arrival. To reduce endogeneity concerns, we focus on events happening within a short period of time since the arrival of individual respondents.[30] We focus on "early" episodes also because refugees' perceptions of local hostility are likely to be shaped by what they experience early on.[31] Table D.1 shows that, holding constant the number of months spent in the country, the preferences of refugees exposed to far-right marches early on are significantly closer to those of German respondents. This effect is driven by individuals assigned to high-threat regions, where the number of demonstrations is higher.

**Convergence by question and threat dimensions.** In Table A.8, we explore how threat influences cultural convergence separately for each of the eight components of the CSI (reported at the top of the corresponding column). Except for the type and frequency

[29]The absence of discrete jumps across arrival cohorts weighs against the possibility that institutional factors (such as labor market access after a given number of months) mechanically influence refugees' economic assimilation.

[30]Specifically, one may be concerned that demonstrations are endogenous to refugees' inflows, which might have an independent impact on a respondent's assimilation trajectories.

[31]This is consistent with the psychological literature on "synaptic tagging and capture" (Frey & Morris, 1997; Richter-Levin & Akirav, 2003; Talarico et al., 2004), and with the idea that demonstrations happening early on might act as "belief twisting events" (Cogley & Sargent, 2008; Friedman & Schwartz, 2008).

of leisure (column 8), the coefficient on the interaction term is always positive. Yet, it is statistically significant, either at the 10% or at the 5% level, only for risk attitudes (column 1), negative reciprocity (column 2), and positive reciprocity (column 3).[32] At the same time, and crucially, in Appendix B, we document that no single dimension of the CSI is driving our results (Figure B.2).

Next, in Table A.9, we analyze the effects of each component of the threat index. Based on principal-component-analyses (Table A.10), we divide the 11 components of the index in three categories with eigenvalue greater than one: the first one loads on contemporary anti-immigrant sentiments; the second one reflects historical hostility against minorities; and, the third one proxies for contemporaneous openness among locals. Both contemporaneous anti-immigrant sentiments (column 1) and lack of openness among locals in recent surveys (column 3) are strongly associated with higher cultural convergence. Instead, no such relationship appears for historical proxies for anti-minority attitudes (column 2). This holds also when including all three sub-components simultaneously (column 4).[33] One explanation, consistent with the evidence discussed above, is that, especially upon arrival, refugees' perceptions are more strongly influenced by recent attitudes among locals (such as anti-immigrant feelings or the degree of openness) than by historical events. Another possibility is that refugees do not perceive anti-Semitism as a direct threat, since more than 85% of them come from majority-Muslim countries (see also Table A.2).[34]

**Other mediating factors.** In Appendix D.2, we explore the potential influence of forces other than threat over refugees' assimilation (Table D.2). First, we document that neither the size nor the opportunities available to the ethnic enclave have a systematic effect on cultural convergence. On the other hand, economic assimilation is slower when the share of individuals born in the same country of origin is higher, but higher employment rates among co-ethnics increase the pace of economic assimilation. Second, we find that task diversity among employees in the region does not influence the speed of either cultural or economic convergence, while skill complexity increases refugees' assimilation along both margins.[35] Third, in line with ambiguous theoretical predictions, we do not find any effect on refugees' cultural and economic assimilation of either the distinctiveness or the degree of heterogeneity of local culture. Finally, we verify that the coefficient on the interaction between MSA and

[32] We adjust standard errors to account for multiple hypotheses testing using the procedure in Clarke et al. (2020), Romano & Wolf (2016), and Romano & Wolf (2005a,b).

[33] In Table A.11, we explore the impact of each threat component at the time. Consistent with Table A.9, natives' attitudes are important determinants of the threat-induced cultural convergence of refugees. Moreover, in line with the evidence presented in Appendix D.1, far-right marches increase the pace of refugees' cultural convergence. Importantly, however, Appendix B documents that no single component of the threat index appears to be driving our results (Figure B.3).

[34] Panel B of Table A.9 shows that none of the threat categories, when interacted with MSA, has a statistically significant effect on economic assimilation. Moreover, in all cases, the point estimate is quantitatively small.

[35] We consider the impact of task diversity and skill complexity (as well as the robustness of our results to these controls), since they might influence refugees' assimilation (Peri & Sparber, 2009).

threat remains close to that from our preferred specification (Table 1, column 6) when including simultaneously the interaction between MSA and all the forces just discussed. This reduces concerns that our findings may be driven by the spurious correlation between local threat and other variables.

## 5.3 Local Threat and "Core" Values

The CSI allows us to measure convergence to the preferences reported by German respondents by combining several important cultural traits. Yet, it does not include a set of "core" values, such as gender norms, support for democracy, and religiosity, since these are not asked to locals. *Ex-ante*, it is unclear whether local threat leads to faster assimilation also along these core beliefs, as abandoning such deep-rooted preferences might be too costly for refugees.

Using questions asked in the refugee survey, in Appendix C.2.2, we construct different index that proxy for attitudes towards women's rights, the importance of democracy, and religiosity. Then, in Table 2, we replicate our preferred specification (Table 1, column 6) for each of these variables. In column 1, we consider gender norms. The positive coefficient on MSA indicates that, with each additional month spent in Germany, refugees become more likely to agree with gender egalitarian statements.[36] Yet, even though the coefficient on the interaction between MSA and threat is positive, it is not statistically significant at conventional levels. This suggests that the change in refugees' gender norms does not occur faster in regions with higher levels of threat.[37]

In column 2, we consider attitudes towards democracy. The coefficient on MSA is positive but not statistically significant. Instead, that on the interaction term is positive and precisely estimated.[38] That is, refugees assigned to regions with higher threat become more supportive of democracy over time. One possible explanation for the different effects of threat on changes in gender norms and support for democracy is that the latter may be less sticky than the former. Moreover, gender norms are more likely to belong to the private sphere, compared to the more abstract notion of institutional preferences.

In column 3, we turn to the importance of religion. Neither the coefficient on MSA nor that on the interaction between MSA and threat is statistically significant. These results are consistent with religious preferences being substantially stickier than other cultural traits

[36]Results are unchanged when interacting year dummies with baseline female labor force participation in the district to account for the possibility that differential trends for attitudes towards women (among locals) may be driving our results.

[37]Results for each individual component of the women's right index are reported in Table A.12, using the original (resp., dichotomized) scale in odd (resp., even) columns. See also Appendix C.2.2 for more details.

[38]Table A.13 replicates the analysis separately for each component of the index. Results are very similar when interacting year dummies with a measure of locals' satisfaction with democracy (in 2010), to allow districts to be on differential trends with respect to support for democracy among natives.

(Giavazzi et al., 2019), so that refugees might deem it too costly to abandon their religious faith.[39] Finally, in column 4, we find that, although refugees attend religious events more frequently as they spend more time in Germany, this effect is reversed for individuals assigned to more threatening regions.[40]

The seemingly contrasting results obtained in columns 3 and 4 may be due to the fact that fewer places of worship for Muslims become available over time in more hostile regions. Another possibility, consistent with the threat hypothesis, is that visiting places of worship is more easily observable than private beliefs about the importance of religion. Hence, refugees may keep their (private) religious orientation, while adjusting their (publicly observable) behavior by reducing the frequency with which they attend religious events, in order to signal cultural assimilation in response to threat.

## 5.4 Summary of Robustness Checks

Besides the exercises summarized in Section 4.2, Appendix B performs several additional robustness checks. First, we show that changes in sample composition, due to either attrition or changes in the sampling framework, do not drive our results (Table B.6). Second, we repeat the analysis measuring cultural assimilation with the Canberra index and with the absolute deviation of refugees' preferences from locals' average (Table B.7). Third, we replicate results by constructing the CSI including additional questions, restricting attention to native-born locals, measuring locals' preferences in the latest survey wave, and defining threat at endline (Tables B.8, B.9, B.10, and B.11). Fourth, we verify that single sub-components of locals' CSI do not change differentially in high-threat regions following refugee inflows (Table B.12), and that results are unchanged when dropping each: CSI trait; threat component; and, German region (Figures B.2, B.3, and B.4). Finally, we show that results are robust to: *i*) clustering standard errors at the district level and accounting for potential spatial correlation (Conley, 1999); *ii*) interacting year dummies with a dummy for Eastern Germany and with dummies for a refugee's country of origin; *iii*) controlling for refugee arrival year fixed effects; *iv*) excluding individuals surveyed more than once to address concerns of bias in difference-in-differences designs with heterogeneous treatment effects (De Chaisemartin & d'Haultfoeuille, 2020; Goodman-Bacon, 2021); *v*) dropping potential outliers; and, *vi*) instrumenting threat in the region of residence using that in the region of assignment (Tables B.13 and B.14).[41]

[39] In fact, religion might help refugees endure the struggles caused by forced displacement (McMichael, 2002).

[40] In unreported regressions, we verified that our estimates are robust to interacting year dummies with the baseline share of Muslim individuals in the district. Table A.13 replicates results separately for the dummy and the non-dummy version of religiosity outcomes.

[41] As anticipated in Section 4.2, Table B.3 verifies that results are also robust to interacting year dummies with additional baseline district level controls (e.g., fiscal capacity, supply of teachers, and availability of schools).

# 6 Mechanisms

Results in Section 5 are consistent with a framework where refugees exert more effort to adopt local culture in more hostile regions, possibly because of fear. Yet, precisely in these regions, locals might require higher levels of effort for minorities to be accepted in the in-group. Thus, despite the higher assimilation effort (proxied for by cultural convergence), refugees may not be more likely to experience assimilation success (measured with economic convergence) in regions characterized by higher levels of hostility. In this section, we provide evidence consistent with this interpretation.

## 6.1 Assimilation Effort vs Success

**One-sided vs cooperative outcomes.** In Table 3, we begin from a question that asks refugees whether they attend or have attended integration or language courses. According to the 2016 Residence Act, migrants with a residence permit are obliged to visit an integration course of the Federal Office for Migrants and Refugees (BAMF) if they cannot communicate in German. Persons whose asylum application has not yet been approved and who come from a country with good prospects of staying can apply for participation. Refugees can attend additional courses, offered by local agencies or non-profit organizations.

We create two separate dummies equal to one if a refugee is attending (or has attended) a mandatory and a voluntary course, respectively. If refugees exerted stronger effort to integrate in more threatening areas, we would expect the interaction between MSA and threat to enter positively for voluntary courses, but not for mandatory ones. This is precisely what we observe in columns 1 and 2 of Table 3: while the coefficient on MSA is positive and statistically significant for both types of courses, that on the interaction between MSA and threat is positive, large, and precisely estimated only for voluntary courses.

In column 3, we consider refugees' proficiency in German, as assessed by the interviewer. The coefficient on MSA is positive and statistically significant, indicating that refugees become more proficient in German over time. However, the interaction between MSA and threat, albeit positive, is small and noisy. One interpretation is that, even though refugees can exert effort to learn German, locals must be willing to interact with them, for the former to become fluent. In more threatening environments, it may be harder for refugees to interact with locals, either because the former are worried about approaching the latter or because of stronger discrimination and segregation against minorities (or both).

Columns 4 to 6 turn to different proxies for inter-group contact. Refugees are more likely to interact with Germans (column 4) and to have a German-born partner (columns 5 and

6) as they spend time in Germany.[42] Yet, the interaction between MSA and threat is never statistically significant and is always quantitatively small. That is, in spite of higher cultural convergence, refugees are not more likely to have close contact with locals in regions with a higher threat index.

Finally, columns 7 and 8 provide suggestive evidence that refugees experience a higher degree of labor market segregation in regions with higher levels of threat. First, refugees in more threatening regions end up working in more ethnically segregated firms, where, arguably, lower levels of cooperation with (or, acceptance from) locals are needed (column 7).[43] Second, refugees assigned to regions with higher threat are less likely to work in "interactive non-routine" occupations, which involve more interactions with both coworkers and consumers (column 8).[44]

**Heterogeneous effects.** Next, we explore heterogeneity by respondents' characteristics. In Table 4, we cut the data along four dimensions: gender, age, presence of children when entering Germany, and education obtained in the country of origin. In columns 1 and 2, we report results separately for women and men. Although both groups converge to local culture as they spend more time in a region, only women seem to respond to higher threat. This can be because women may be more vulnerable, and thus more likely to react to threat (consistent with Figure A.4). Another possibility, not in contrast with the previous one, is that external threat lowers the pressure faced by women from other family members to retain their home-country culture. In columns 3 and 4, we show that, instead, threat has no differential effect for young (18 to 30 years-old) and old individuals.

Next, in columns 5 and 6, we split the sample between individuals who arrived in Germany with and without children. The coefficient on the interaction between threat and MSA is larger for refugees who arrived in Germany with children than for those who did not. Moreover, it is statistically significant for the former, but not for the latter. This is consistent with the idea that the threat-induced convergence should be stronger among parents, who may be worried about harassment against their offspring, or that discrimination and physical violence may impair their ability to take care of their children. It is also possible that parents learn about local conditions, including both threat and social norms, as their offspring interact with native-born children. In columns 7 and 8, we turn to education (acquired before leaving the country of origin), splitting the sample between respondents without and with a school-leaving certificate, respectively. Consistent with less educated individuals being

[42] In column 5 (resp., column 6), the sample is restricted to female (resp., male) respondents.

[43] To produce this result, we use data from Keita & Trübswetter (2020) that links refugees in our survey to administrative data at the firm level to identify the share of immigrant workers in a company.

[44] Based on Dengler et al. (2014), we classify occupations that are characterized by interactive non-routine tasks, analytical non-routine tasks, cognitive routine tasks, manual routine tasks, and manual non-routine tasks following Autor et al. (2003). Our findings are consistent with those in Peri & Sparber (2009) and Haas et al. (2013), according to which it is particularly hard for immigrants to be employed in interactive tasks.

more vulnerable to discrimination and harassment, the coefficient on the interaction between threat and MSA is larger for this group than for individuals with higher levels of education, even though the difference is not statistically significant.

Finally, in columns 9 and 10, we consider the size of the ethnic enclave, splitting respondents who live in districts with the share of individuals born in their country of origin above and below the sample median, respectively. Results indicate that threat-induced convergence is driven by refugees living in areas with smaller enclaves, where refugees might feel more vulnerable to local hostility.

## 6.2 Refugee Inflows and Locals' Preferences

In this section, we turn to the attitudes and the behavior of locals. We can no longer exploit variation in time spent by refugees in German regions with different levels of threat. Instead, we examine if the relationship between refugee inflows and natives' attitudes varies with the pre-existing level of threat in the region. We estimate regressions that include district and survey year fixed effects, individual controls, baseline district characteristics interacted with year dummies, the share of refugees (measured at the end of the year prior to that of the interview), and its interaction with threat.[45] Since this analysis is admittedly less cleanly identified than that conducted above, results should be interpreted as suggestive evidence on locals' response to refugee inflows.

**Attitudes.** In Table 5, we consider locals' attitudes towards refugees, elicited in survey years 2016 and 2018. In columns 1 to 3, we focus on locals' assessment of the impact of refugees on the economy, cultural life, and Germany as a place to live. In columns 4 and 5, we turn to respondents' opinion on whether refugees represent a risk for the short- and the long-run, respectively. Higher values always refer to more positive views towards refugees. The coefficient on the refugee share is unstable and never statistically significant; instead, that on the interaction term is strongly negative and precisely estimated. That is, following the inflow of asylum seekers, locals living in regions with higher threat view refugees more negatively. In light of our findings for refugees' cultural convergence, this pattern is striking: even though refugees converge faster in regions with higher threat, locals' attitudes become more negative following refugee inflows in these regions. The worsening of locals' views may, at least in part, also explain why refugees do not experience faster economic assimilation in more threatening regions, despite faster cultural convergence.

**Behavior.** Next, we turn to locals' behavior, examining if the inflow of refugees influences

[45] District characteristics are the same as before (unemployment, population density, and the refugee share). Individual controls include: age, age squared, gender, nativity, and education (classified in 4 categories). The main effect of threat is absorbed by the district fixed effects.

the prevalence of endogamous mating among German-born locals. Inter-marriage, or inter-group mating more generally, is considered the "final stage of assimilation" by sociologists (Gordon, 1964). The increase in the refugee population might change the pattern of inter-group mating by altering sex-ratios, since refugees are more likely to be both male and young, relative to locals (Table A.2). Mechanically, changes in sex-ratios should increase the probability of inter-group mating for native-born women and reduce it for native men. However,since only .2% of the German-born SOEP respondents in our sample report having a relationship with an individual of refugee background, we expect changes in sex-ratios to play a negligible role, if at all, on inter-group mating.

In Table 6, we restrict the sample to German-born individuals who report being in a relationship, and define the dependent variable as a dummy equal to one if the partner was born in Germany. The coefficient on the interaction term is positive and statistically significant at the 10% level (column 1), indicating that refugee inflows increase the prevalence of endogamous mating, but only in areas characterized by higher threat. This might help explain why, in spite of higher cultural similarity, refugees are unable to integrate faster in more hostile areas.

These results are entirely driven by women (column 2): the coefficient on the interaction term is twice as large as in the full sample and statistically significant at the 1% level. When considering native men (column 3), instead, results are noisy and quantitatively small. One interpretation is that native women in areas with a higher threat index react more than men to the presence of outsiders, and decide to start a new relationship with a partner who shares a similar cultural background. Another possibility, not in contrast with the previous one, is that families in regions with a higher threat index exert stronger pressure on women – but not on men – to start a new relationship with a native partner when ethnic diversity is higher, so as to preserve cultural homogeneity.

**Counter-mobilization.** We have thus far conjectured that the faster cultural convergence of refugees in regions with higher threat is driven by fear and anxiety, instilled by locals' hostility. This is consistent with the negative relationship between refugee inflows and (changes in) locals' attitudes and behavior in more threatening areas documented above. An alternative interpretation is that the stronger hostility prevailing in high-threat regions led some locals and non-profit organizations to coordinate efforts to facilitate the cultural integration of refugees (Vüllers & Hellmeier, 2022). To test this hypothesis, in columns 4 to 6 of Table 6, we use as dependent variable a dummy equal to one if a local: *i*) donated to a refugee specific cause (column 4); *ii*) volunteered for a refugee related cause (column 5); *iii*) demonstrated to support refugees (column 6).[46] While refugee inflows are associated with fewer

[46]These questions were available only for years 2016 and 2018. In addition to district fixed effects, interactions between year

pro-refugee donations, there is no differential effect for locals living in regions with higher threat. Results for the other two proxies for counter-mobilization are imprecisely estimated. In Appendix D.3, we corroborate the (lack of) evidence on locals' counter-mobilization by focusing on pro-refugee tweets and the presence of NGOs across regions.

# 7 Conclusion

In this paper, we study how local hostility influences refugees' cultural and economic assimilation. We combine plausibly exogenous variation in the allocation of refugees across German regions between 2013 and 2016 with novel survey data to measure cultural preferences and economic outcomes of both refugees and locals. We find that refugees converge culturally and economically as they spend more time in Germany. This process is not uniform, though: cultural convergence is faster among refugees assigned to areas where locals display higher hostility against minorities. Yet, despite the higher cultural convergence, refugees are not more likely to integrate economically in these regions.

These patterns are consistent with a framework where refugees respond to pressure by exerting more effort to learn and adopt local culture. However, in order for refugees to successfully assimilate (socially and economically), locals must be willing to accept them in the majority group. If discrimination against minorities is higher in regions characterized by higher threat, refugees may not be able to achieve faster integration, even if they exert more effort to learn and adopt local culture. The second part of the paper provides evidence consistent with this interpretation.

Our paper has no normative implications, and our results do not imply that minority groups should (or should not) assimilate to the culture of receiving countries. At the same time, our work casts doubts on the effectiveness of pressure and hostility as tools to promote integration. While minorities may exert more effort to learn and adopt local values, they may not successfully assimilate in host societies if locals take actions that hinder inter-group interactions. Our findings also open the door to several questions. Does cultural convergence generated by threat in the short-run persist in the long-run? Or, does backlash among minorities arise? Can inter-group interactions induce locals to accept more diversity, and reduce pressure exerted on migrants and refugees to assimilate?

As the number of forcibly displaced individuals is projected to rise exponentially in the years to come, answering these questions will be of first order importance.

dummies and baseline district controls, and individual characteristics, we include respondents' overall willingness to volunteer in associations and engage politically at baseline in 2010 and 2012, respectively. Results are unchanged when dropping these additional controls.

# References


Abadie, A., Athey, S., Imbens, G. W., & Wooldridge, J. (2017). When Should You Adjust Standard Errors for Clustering? NBER Working Paper 24003.

Abdelgadir, A. & Fouka, V. (2020). Political Secularism and Muslim Integration in the West: Assessing the Effects of the French Headscarf Ban. *American Political Science Review*, 114(3), 707–723.

Abramitzky, R., Boustan, L., & Eriksson, K. (2020a). Do Immigrants Assimilate More Slowly Today Than in the Past? *American Economic Review: Insights*, 2(1), 125–41.

Abramitzky, R., Boustan, L. P., & Connor, D. (2020b). Leaving the Enclave: Historical Evidence on Immigrant Mobility from the Industrial Removal Office. NBER Working Paper 27372.

Acemoglu, D., De Feo, G., De Luca, G., & Russo, G. (2022). War, Socialism, and the Rise of Fascism: an Empirical Exploration. *The Quarterly Journal of Economics*, 137(2), 1233–1296.

Advani, A. & Reich, B. (2015). Melting Pot or Salad Bowl: the Formation of Heterogeneous Communities. IFS Working Papers W15/30.

Aksoy, C. G., Poutvaara, P., & Schikora, F. (2021). First Time Around: Local Conditions and Multi-dimensional Integration of Refugees. ifo Working Paper No. 361.

Alesina, A., Tabellini, G., & Trebbi, F. (2017). Is Europe an Optimal Political Area? *Brookings Papers on Economic Activity*, 48(1 (Spring)), 169–234.

ALLBUS (2021). German General Social Survey – Cumulation 1980-2018. *GESIS Data Archive*, Cologne. ZA5276 Data file Version 1.1.0, https://doi.org/10.4232/1.13774.

Autor, D. H., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An empirical Exploration. *The Quarterly Journal of Economics*, 118(4), 1279–1333.

Bahar, D., Özgüzel, C., Hauptmann, A., & Rapoport, H. (2022). Migration and Post-Conflict Reconstruction: The Effect of Returning Refugees on Export Performance in the Former Yugoslavia. *Review of Economics and Statistics*, Forthcoming.

Baier, A. & Siegert, M. (2018). Die Wohnsituation Geflüchteter. *BAMF-Kurzanalyse*, 02|2018.

Bailey, M., Johnston, D. M., Koenen, M., Kuchler, T., Russel, D., & Stroebel, J. (2022). *The Social Integration of International Migrants: Evidence from the Networks of Syrians in Germany*. Technical report, National Bureau of Economic Research.

Bandiera, O., Mohnen, M., Rasul, I., & Viarengo, M. (2019). Nation-Building Through Compulsory Schooling During the Age of Mass Migration. *The Economic Journal*, 129(617), 62–109.

Barsbai, T., Rapoport, H., Steinmayr, A., & Trebesch, C. (2017). The Effect of Labor Migration on the Diffusion of Democracy: Evidence from a Former Soviet Republic. *American Economic Journal: Applied Economics*, 9(3), 36–69.

Battisti, M., Peri, G., & Romiti, A. (2021). Dynamic Effects of Co-Ethnic Networks on Immigrants' Economic Success. *The Economic Journal*, 132(641), 58–88.

Bauer, T. K., Braun, S., & Kvasnicka, M. (2013). The economic integration of forced migrants: Evidence for post-war germany. *The Economic Journal*, 123(571), 998–1024.

Bazzi, S., Ferrara, A., Fiszbein, M., Pearson, T. P., & Testa, P. A. (2021). The other great migration: Southern whites and the new right. NBER Working Paper 29056.

BBSR (2018). Laufende Raumbeobachtung – Raumabgrenzungen, Siedlungsstrukturelle Kreistypen. The Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), https://www.bbsr.bund.de/BBSR/DE/forschung/raumbeobachtung/Raumabgrenzungen/deutschland/kreise/siedlungsstrukturelle-kreistypen/kreistypen.html?nn=2544954.

Becker, S. O. & Ferrara, A. (2019). Consequences of Forced Migration: A Survey of Recent Findings. *Labour Economics*, 59, 1–16.

Becker, S. O., Grosfeld, I., Grosjean, P., Voigtlander, N., & Zhuravskaya, E. (2020). Forced migration and human capital: Evidence from post-wwii population transfers. *American Economic Review*, 110(5), 1430–63.

Benner, A. D., Wang, Y., Shen, Y., Boyle, A. E., Polk, R., & Cheng, Y.-P. (2018). Racial/Ethnic Discrimination and Well-Being During Adolescence: A Meta-Analytic Review. *American Psychologist*, 73(7), 855–883.

Bergolo, M. L., Leites, M., Perez-Truglia, R., & Strehl, M. (2020). What makes a tax evader? NBER Working Paper 28235.

Bertrand, M. & Kamenica, E. (2018). Coming Apart? Cultural Distances in the United States Over Time. NBER Working Paper 24771.

Bisin, A., Rubin, J., Seror, A., & Verdier, T. (2021). *Culture, Institutions the Long Divergence*. Working Paper 28488, National Bureau of Economic Research.

Bisin, A. & Tura, G. (2019). Marriage, Fertility, and Cultural Integration in Italy. NBER Working Paper 26303.

Block, J. & Block, J. H. (2006). Nursery School Personality and Political Orientation Two Decades Later. *Journal of Research in Personality*, 40(5), 734–749.

Boelmann, B., Raute, A., & Schonberg, U. (2021). Wind of Change? Cultural Determinants of Maternal Labor Supply. CEPR Discussion Paper No. DP16149.

Boustan, L. P. (2010). Was Postwar Suburbanization "White Flight"? Evidence from the Black Migration. *The Quarterly Journal of Economics*, 125(1), 417–443.

Brell, C., Dustmann, C., & Preston, I. (2020). The Labor Market Integration of Refugee Migrants in High-Income Countries. *Journal of Economic Perspectives*, 34(1), 94–121.

Brücker, H., Rother, N., & Schupp, J. (2016). *IAB-BAMF-SOEP-Befragung von Geflüchteten: Überblick und erste Ergebnisse*. Number 116. DIW Berlin: Politikberatung kompakt.

Bundesagentur für Arbeit (2020). Beschäftigtenstatistik.

Bundesanzeiger (2016). Bekanntmachungdes Königsteiner Schlüssels für das Jahr 2016. BAnz AT 20.06.2016 B1.

Bundeswahlleiter (2013). Ergebnisse der Bundestagswahl 2013.

Bundeswahlleiter (2020). Ergebnisse der Bundestagswahl 2017.

Bursztyn, L., Chaney, T., Hassan, T. A., & Rao, A. (2021). The immigrant next door: Exposure, prejudice, and altruism. *University of Chicago, Becker Friedman Institute for Economics Working Paper*, (2021-16).

Busch, C., Krueger, D., Ludwig, A., Popova, I., & Iftikhar, Z. (2020). Should Germany Have Built a New Wall? Macroeconomic Lessons from the 2015-18 Refugee Wave. *Journal of Monetary Economics*, 113, 28–55.

Butler, J. C. (2000). Personality and Emotional Correlates of Right-Wing Authoritarianism. *Social Behavior and Personality: an International Journal*, 28(1), 1–14.

Cantoni, D., Hagemeister, F., & Westcott, M. (2019). Persistence and activation of right-wing political ideology.

Cantoni, D., Heizlsperger, L.-J., Yang, D. Y., Yuchtman, N., & Zhang, Y. J. (2022). The Fundamental Determinants of Protest Participation: Evidence from Hong Kong's Antiauthoritarian Movement. *Journal of Public Economics*, 211, 104667.

Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The Secret Lives of Liberals and Conservatives: Personality Profiles, Interaction Styles, and the Things They Leave Behind. *Political psychology*, 29(6), 807–840.

Cha, S.-H. (2007). Comprehensive Survey on Distance/Similarity Measures Between Probability Density Functions. *International Journal of Mathematical Models and Methods in Applied Sciences*, 1(4), 300–307.

Clarke, D., Romano, J. P., & Wolf, M. (2020). The Romano–Wolf Multiple-Hypothesis Correction in Stata. *The Stata Journal*, 20(4), 812–843.

Cogley, T. & Sargent, T. J. (2008). The Market Price of Risk and the Equity Premium: A Legacy of the Great Depression? *Journal of Monetary Economics*, 55(3), 454–476.

Colella, F., Lalive, R., Sakalli, S. O., & Thoenig, M. (2019). Inference with Arbitrary Clustering. IZA Discussion Papers(12584).

Colussi, T., Isphording, I. E., & Pestel, N. (2021). Minority Salience and Political Extremism. *American Economic Journal: Applied Economics*, (3), 237–71.

Conley, T. G. (1999). GMM Estimation with Cross Sectional Dependence. *Journal of Econometrics*, 92(1), 1–45.

Dahl, G. B., Felfe, C., Frijters, P., & Rainer, H. (2021). Caught Between Cultures: Unintended Consequences of Improving Opportunity for Immigrant Girls. *The Review of Economic Studies*, Forthcoming.

David, H. & Dorn, D. (2013). The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market. *American Economic Review*, 103(5), 1553–97.

De Chaisemartin, C. & d'Haultfoeuille, X. (2020). Two-way Fixed Effects Estimators with Heterogeneous Treatment Effects. *American Economic Review*, 110(9), 2964–96.

Dengler, K., Matthes, B., & Paulus, W. (2014). Occupational Tasks in the German Labour Market. *FDZ Methodenreport*.

Deole, S. S. & Huang, Y. (2020). How do New Immigration Flows Affect Existing Immigrants? Evidence from the Refugee Crisis in Germany. GLO Discussion Paper 579.

Desmet, K. & Wacziarg, R. (2021). The Cultural Divide. *The Economic Journal*, 131(637), 2058–2088.

Destatis (2021). Federal Statistical Office, Genesis-Online Database.

Devlin, J., Chang, M., Lee, K., & Toutanova, K. (2018). BERT: Pre-Training of Deep Bidirectional Transformers for Language Understanding. *CoRR*, abs/1810.04805.

Edin, P.-A., Fredriksson, P., & Åslund, O. (2003). Ethnic Enclaves and the Economic Success of Immigrants—Evidence from a Natural Experiment. *The Quarterly Journal of Economics*, 118(1), 329–357.

Enke, B. (2020). Moral Values and Voting. *Journal of Political Economy*, 128(10), 3679–3729.

Eriksson, K. (2020). Ethnic Enclaves and Immigrant Outcomes: Norwegian Immigrants During the Age of Mass Migration. *European Review of Economic History*, 24(3), 427–446.

Eurostat (2021). Asylum and First Time Asylum Applicants - Annual Aggregated Data (Rounded). Eurostat Data Browser.

Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018). Global Evidence on Economic Preferences. *The Quarterly Journal of Economics*, 133(4), 1645–1692.

Falter, J. W. & Hänisch, D. (1990). Election and Social Data of the Districts and Municipalities of the German Empire from 1920 to 1933. GESIS Data Archive, Cologne. ZA8013 Data file Version 1.0.0, https://doi.org/10.4232/1.8013.

Fernández, R. & Fogli, A. (2009). Culture: An Empirical Investigation of Beliefs, Work, and Fertility. *American Economic Journal: Macroeconomics*, 1(1), 146–77.

Fouka, V. (2019). How do Immigrants Respond to Discrimination? The Case of Germans in the US During World War I. *American Political Science Review*, 113(2), 405–422.

Fouka, V. (2020). Backlash: The Unintended Effects of Language Prohibition in US Schools After World War I. *The Review of Economic Studies*, 87(1), 204–239.

Fouka, V., Mazumder, S., & Tabellini, M. (2022). From Immigrants to Americans: Race and Assimilation during the Great Migration. *The Review of Economic Studies*, 89(2), 811–842.

Frey, U. & Morris, R. G. (1997). Synaptic Tagging and Long-Term Potentiation. *Nature*, 385(6616), 533–536.

Friedman, M. & Schwartz, A. J. (2008). *A Monetary History of the United States, 1867-1960*. Princeton University Press.

Fujiwara, T., Müller, K., & Schwarz, C. (2021). The Effect of Social Media on Elections: Evidence from the United States. NBER Working Paper 28849.

Gehrsitz, M. & Ungerer, M. (2022). Jobs, Crime and Votes: A Short-run Evaluation of the Refugee Crisis in Germany. *Economica*, 89(355), 592–626.

Giavazzi, F., Petkov, I., & Schiantarelli, F. (2019). Culture: Persistence and Evolution. *Journal of Economic Growth*, 24(2), 117–154.

Giuliano, P. & Nunn, N. (2021). Understanding cultural persistence and change. *The Review of Economic Studies*, 88(4), 1541–1581.

Giuliano, P. & Tabellini, M. (2020). *The Seeds of Ideology: Historical Immigration and Political Preferences in the United States*. Technical report, National Bureau of Economic Research.

Glover, D. (2019). Job Search and Intermediation Under Discrimination: Evidence from Terrorist Attacks in France. Chaire Securisation des Parcours Professionels, Working Paper 2019-02.

Goebel, J., Grabka, M. M., Liebig, S., Kroh, M., Richter, D., Schröder, C., & Schupp, J. (2019). The German Socio-Economic Panel (SOEP). *Jahrbücher für Nationalökonomie und Statistik*, 239(2), 345–360.

Goodman-Bacon, A. (2021). Difference-in-differences with Variation in Treatment Timing. *Journal of Econometrics*, 225(2), 254–277.

Gordon, M. M. (1964). *Assimilation in American Life: The Role of Race, Religion, and National Origins*. Oxford University Press on Demand.

Graeber, D. & Schikora, F. (2021). Hate is too Great a Burden to Bear: Hate Crimes and the Mental Health of Refugees. CEPA Discussion Paper No. 31.

Guhr, O., Schumann, A.-K., Bahrmann, F., & Böhme, H. J. (2020). Training a Broad-Coverage German Sentiment Classification Model for Dialog Systems. In *Proceedings of The 12th Language Resources and Evaluation Conference* (pp. 1627–1632).

Haas, A., Lucht, M., & Schanne, N. (2013). Why to Employ Both Migrants and Natives? A Study on Task-Specific Substitutability. *Journal for Labour Market Research*, 46(3), 201–214.

Hangartner, D., Dinas, E., Marbach, M., Matakos, K., & Xefteris, D. (2019). Does Exposure to the Refugee Crisis Make Natives More Hostile? *American Political Science Review*, 113(2), 442–455.

Hatte, S., Madinier, E., & Zhuravskaya, E. (2021). Reading Twitter in the Newsroom: How Social Media Affects Traditional-Media Reporting of Conflicts. Available at SSRN 3845739.

Hilbig, H. & Riaz, S. (2022). Freedom of Movement Restrictions Inhibit the Social Integration of Refugees. *The Journal of Politics*, Forthcoming.

INKAR (2021). INKAR – Indikatoren und Karten zur Raum- und Stadtentwicklung. The Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), https://www.inkar.de/.

Jost, J. T. (2006). The End of the End of Ideology. *American Psychologist*, 61(7), 651–670.

Kam, C. D. (2012). Risk Attitudes and Political Participation. *American Journal of Political Science*, 56(4), 817–836.

Kanol, E. & Knoesel, J. (2021). Right-Wing Extremist Mobilization in Germany. *WZB Berlin Social Science Center*, Version 1.0.0, 125–41.

Keita, S. & Trübswetter, P. (2020). IAB-BAMF-SOEP Survey of Refugees linked to administrative data of the IAB. Institute for Employment Research (IAB), FDZ-Datenreport 15-2020 EN.

Kühne, S., Jacobsen, J., & Kroh, M. (2019). Sampling in Times of High Immigration: The Survey Process of the IAB-BAMF-SOEP Survey of Refugees. *Survey Methods: Insights from the Field*.

Lange, M. (2021). The Legacy of State Socialism on Attitudes Toward Immigration. *Journal of Comparative Economics*, 49(3), 733–750.

Littvay, L., Weith, P. T., & Dawes, C. T. (2011). Sense of Control and Voting: A Genetically-Driven Relationship. *Social Science Quarterly*, 92(5), 1236–1252.

Lleras-Muney, A. & Shertzer, A. (2015). Did the Americanization Movement Succeed? An Evaluation of the Effect of English-Only and Compulsory Schooling Laws on Immigrants. *American Economic Journal: Economic Policy*, 7(3), 258–90.

Martén, L., Hainmueller, J., & Hangartner, D. (2019). Ethnic Networks Can Foster the Economic Integration of Refugees. *Proceedings of the National Academy of Sciences*, 116(33), 16280–16285.

McCrae, R. R. (1996). Social Consequences of Experiential Openness. *Psychological Bulletin*, 120(3), 323.

McMichael, C. (2002). 'Everywhere is Allah's Place': Islam and the Everyday Life of Somali Women in Melbourne, Australia. *Journal of Refugee Studies*, 15(2), 171–188.

Müller, K. & Schwarz, C. (2020). From Hashtag to Hate Crime: Twitter and Anti-Minority Sentiment. Available at SSRN 3149103.

Peri, G. & Sparber, C. (2009). Task Specialization, Immigration, and Wages. *American Economic Journal: Applied Economics*, 1(3), 135–69.

Rapoport, H., Sardoschau, S., & Silve, A. (2021). Migration and Cultural Change. IZA Discussion Papers(14772).

Richter-Levin, G. & Akirav, I. (2003). Emotional Tagging of Memory Formation—In the Search for Neural Mechanisms. *Brain Research Reviews*, 43(3), 247–256.

Romano, J. P. & Wolf, M. (2005a). Exact and Approximate Stepdown Methods for Multiple Hypothesis Testing. *Journal of the American Statistical Association*, 100(469), 94–108.

Romano, J. P. & Wolf, M. (2005b). Stepwise Multiple Testing as Formalized Data Snooping. *Econometrica*, 73(4), 1237–1282.

Romano, J. P. & Wolf, M. (2016). Efficient Computation of Adjusted p-values for Resampling-Based Stepdown Multiple Testing. *Statistics & Probability Letters*, 113, 38–40.

Saavedra, M. (2021). Kenji or Kenneth? Pearl Harbor and Japanese-American Assimilation. *Journal of Economic Behavior & Organization*, 185, 602–624.

Satyanath, S., Voigtländer, N., & Voth, H.-J. (2017). Bowling for fascism: Social capital and the rise of the nazi party. *Journal of Political Economy*, 125(2), 478–526.

Schilling, P. & Stillman, S. (2021). The Impact of Natives' Attitudes Towards Immigrants on Their Integration in the Host Country. IZA Discussion Paper No. 14728.

Sharoff, S. (2006). Open-Source Corpora: Using the Net to Fish for Linguistic Data. *International Journal of Corpus Linguistics*, 11(4), 435–462.

SOEP (2020). Socio-Economic Panel (SOEP), data for years 1984-2019, version 36. doi: 10.5684/soep.core.v36eu.

Spolaore, E. & Wacziarg, R. (2016). Ancestry, language and culture. In *The Palgrave handbook of economics and language* (pp. 174–211). Springer.

Talarico, J. M., LaBar, K. S., & Rubin, D. C. (2004). Emotional Intensity Predicts Autobiographical Memory Experience. *Memory & Cognition*, 32(7), 1118–1132.

UNHCR (2022). Ukraine Refugee Situation. UNHCR Operational Data Portal. Accessed on 12 August 2022.

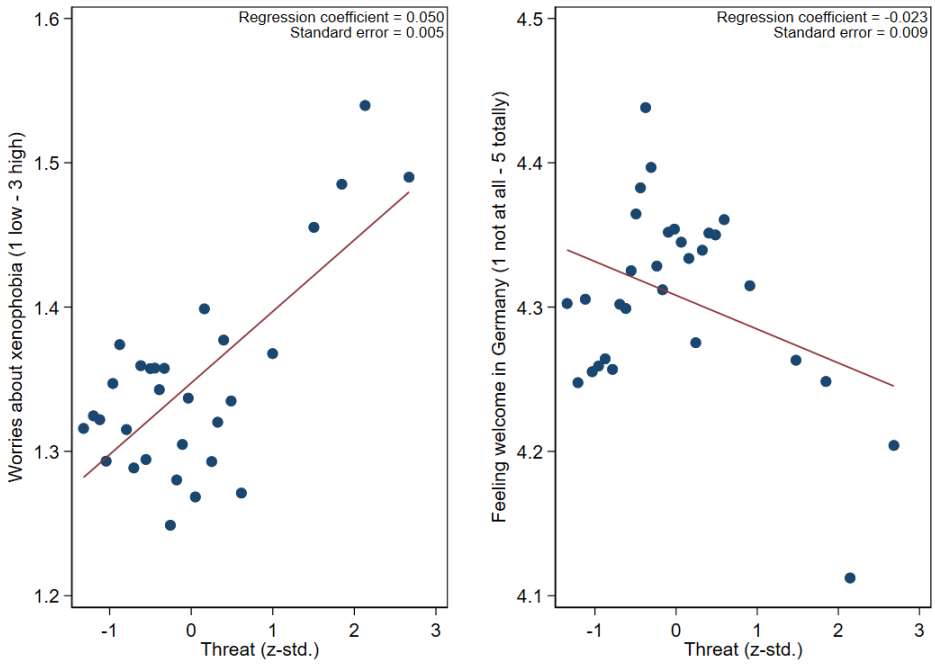
Voigtländer, N. & Voth, H.-J. (2012). Persecution Perpetuated: the Medieval Origins of Anti-Semitic Violence in Nazi Germany. *The Quarterly Journal of Economics*, 127(3), 1339–1392.

Voigtländer, N. & Voth, H.-J. (2013). Married to intolerance: Attitudes toward intermarriage in germany, 1900-2006. *American Economic Review*, 103(3), 79–85.

Vüllers, J. & Hellmeier, S. (2022). Does Counter-mobilization Contain Right-wing Populist Movements? Evidence from Germany. *European Journal of Political Research*, 61(1), 21–45.

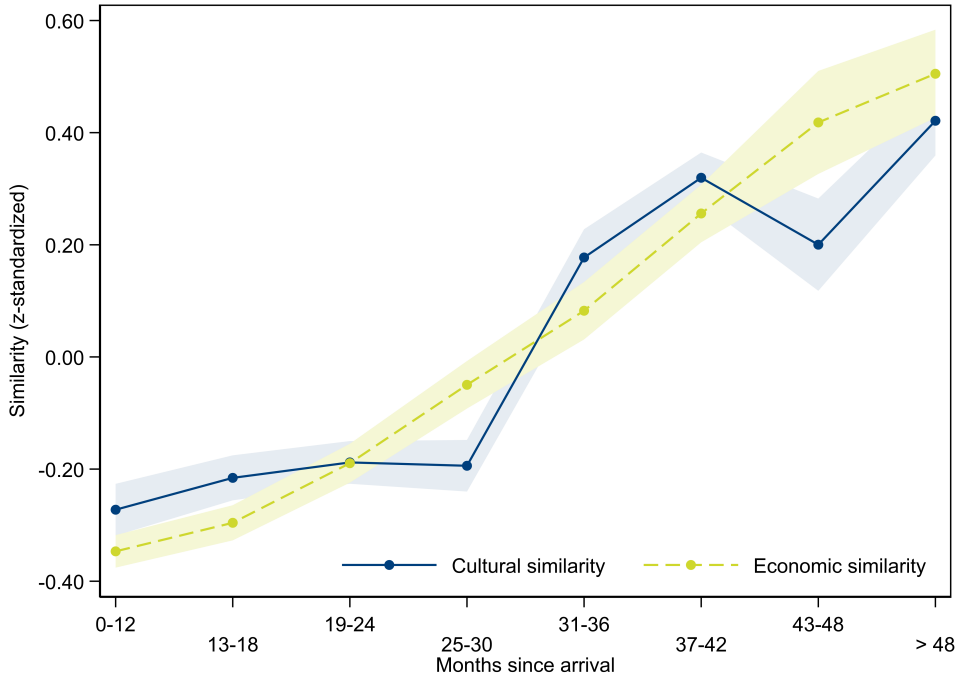
Walther, L., Fuchs, L. M., Schupp, J., & von Scheve, C. (2020). Living Conditions and the Mental Health and Well-being of Refugees: Evidence from a Large-scale German Survey. *Journal of Immigrant and Minority Health*, 22(5), 903–913.

Figure 1. Validation of threat: Worries about xenophobia and feeling welcome




*Notes:* Binned scatterplot of the relationship between the threat index described in the main text and refugees' self-reported worry about xenophobia (left panel) and feeling welcome in Germany (right panel). Variables on the x- and y-axes represent residual changes, after partialling out months since arrival, survey year dummies, and individual controls (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status, and location of partner as well as work experience and education upon arrival).

Figure 2. Economic and cultural convergence




*Notes:* The graph shows the evolution of cultural (in blue solid line) and economic (in green dashed line) similarity between refugees and locals since refugee arrival. Economic and cultural similarity are z-standardized.

Table 1. Assimilation and local threat: Main results

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | | | |
| MSA | 0.120*** | 0.128*** | 0.127*** | 0.129*** | 0.129*** | 0.129*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat | | 0.087*** | 0.074*** | 0.090*** | 0.095*** | 0.082*** |
| | | (0.026) | (0.028) | (0.026) | (0.027) | (0.031) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | | | |
| MSA | 0.770*** | 0.768*** | 0.770*** | 0.767*** | 0.768*** | 0.772*** |
| | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat | | -0.019 | -0.002 | -0.021 | -0.011 | 0.016 |
| | | (0.028) | (0.029) | (0.028) | (0.029) | (0.032) |
| R2 adjusted | 0.179 | 0.179 | 0.180 | 0.179 | 0.179 | 0.180 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| Survey year | Yes | Yes | Yes | Yes | Yes | Yes |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables and individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). Column 3 controls for the interaction of unemployment rate at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 4 controls for the interaction of population density at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 5 controls for the interaction of refugees' share at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 6 includes controls of columns 3, 4, 5 all together. Panel A always controls for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2. Cultural change: "Core values"

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Women's rights | Importance of democracy | Importance of religion (1 low - 4 very important) | Freq. church and relig. events attendance (1 never - 5 daily) |
| MSA | 0.528*** | 0.189 | -0.245 | 0.392*** |
| | (0.143) | (0.169) | (0.154) | (0.137) |
| MSA × Threat | 0.164 | 0.477*** | 0.040 | -0.211* |
| | (0.137) | (0.158) | (0.149) | (0.120) |
| R2 adjusted | 0.079 | 0.089 | 0.086 | 0.176 |
| Person-Year observations | 5,925 | 4,737 | 4,954 | 8,004 |
| Person observations | 5,925 | 4,737 | 4,954 | 5,127 |
| Individual controls | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | |
| District | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes |

*Notes:* The dependent variables are variables constructed from refugees' survey that reflect agreement of refugees' for 3 "core" values: women's rights (column 1), importance of democracy (column 2), importance of religion (column 3), and frequency of church and religious events attendance (column 4). The exact definition of each variable is reported in Appendix C.2.2. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model, along with the dependent variable. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction between year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Column 4 also controls for the share of Muslims in the region. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3. Assimilation outcomes: One-sided vs cooperative

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Voluntary integration course | Mandatory integration course | Language skills (1 bad - 5 good) | Time spent with Germans (1 never - 6 daily) | Partner German born (among females) | Partner German born (among males) | Percentage foreigners in company | Main task interactive non-routine |
| MSA | 0.507*** | 0.619*** | 3.296*** | 2.291*** | 0.380* | 0.278* | 10.985 | 0.080 |
| | (0.061) | (0.056) | (0.128) | (0.203) | (0.216) | (0.144) | (12.624) | (0.080) |
| MSA × Threat | 0.090** | 0.021 | 0.048 | 0.041 | 0.075 | -0.079 | 20.197* | -0.110* |
| | (0.042) | (0.040) | (0.100) | (0.157) | (0.112) | (0.074) | (10.471) | (0.066) |
| R2 adjusted | 0.117 | 0.211 | 0.299 | 0.117 | 0.498 | 0.478 | 0.136 | 0.070 |
| Dep. var. mean | 0.556 | 0.534 | 3.012 | 3.721 | 0.173 | 0.121 | 33.321 | 0.102 |
| Person-Year observations | 12,101 | 12,243 | 12,334 | 12,302 | 773 | 1,398 | 1,143 | 2,058 |
| Person observations | 6,605 | 6,665 | 6,691 | 6,683 | 440 | 734 | 855 | 1,516 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is i) attendance to non-BAMF integration courses (column 1); ii) attendance to BAMF integration courses (column 2); iii) the German level of the interviewee assessed by the interviewer (column 3); iv) the self-reported time spent with Germans (column 4); v) a dummy for having a German-born partner for females and males, obtained from the self-declaration of the partner in the survey (columns 5 and 6); vi) the percentage of non-German citizens among employees who are foreign-born in the refugee's company (column 7); and, having occupations which require a higher frequency of interactions with both coworkers and consumers (column 8). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Heterogeneous effects

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gender | | Age | | Child in household | | Education abroad | | Network size | |
| | Female | Male | 18-30 | $> 30$ | Yes | No | Non-certified | Certified | Above | Below |
| MSA | 0.142** | 0.101* | 0.137** | 0.101* | 0.088 | 0.158** | 0.062 | 0.114** | 0.068 | 0.191*** |
| | (0.063) | (0.057) | (0.066) | (0.055) | (0.055) | (0.070) | (0.064) | (0.057) | (0.055) | (0.064) |
| MSA × Threat | 0.124** | 0.041 | 0.096** | 0.071* | 0.096** | 0.058 | 0.093* | 0.067* | -0.022 | 0.138*** |
| | (0.053) | (0.040) | (0.048) | (0.042) | (0.043) | (0.050) | (0.050) | (0.040) | (0.040) | (0.050) |
| R2 adjusted | 0.396 | 0.389 | 0.378 | 0.408 | 0.391 | 0.391 | 0.415 | 0.376 | 0.396 | 0.402 |
| Dep. var. mean | -1.945 | -1.880 | -1.885 | -1.920 | -1.929 | -1.876 | -1.943 | -1.875 | -1.911 | -1.898 |
| Person-Year observations | 4,719 | 7,615 | 5,175 | 7,159 | 7,074 | 5,007 | 5,449 | 6,830 | 6,537 | 5,796 |
| Person observations | 2,663 | 4,028 | 3,107 | 3,830 | 4,015 | 2,888 | 3,026 | 3,636 | 3,612 | 3,078 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the cultural assimilation index. Each column presents the regression on a different subsample. The sample is restricted to refugee respondents that are: i) female and male (columns 1 and 2); ii) below and above the age of 30 (columns 3 and 4); iii) with and without children (columns 5 and 6); iv) with and without a certified education degree (columns 7 and 8); and, v) above or below the median of the share of individuals from the same country of origin of the respondent (columns 9 and 10). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. All regressions control for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Locals' response to refugees: Attitudes towards refugees

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Impact of refugees on | | | Refugee risk or chance | |
| | Economy (1 bad - 11 good) | Cultural life (1 undermine - 11 enrich) | Germany as a place to live (1 worse - 11 better) | Short-run (1 risk - 11 chance) | Long-run (1 risk - 11 chance) |
| Refugee share | 2.308 | -4.330 | -4.561 | 0.823 | 5.156 |
| | (5.070) | (5.062) | (4.569) | (4.702) | (5.114) |
| Refugee share × Threat | -13.223*** | -8.023*** | -11.812*** | -11.172*** | -7.499** |
| | (2.933) | (2.974) | (2.774) | (2.823) | (3.063) |
| R2 adjusted | 0.114 | 0.128 | 0.114 | 0.059 | 0.140 |
| Dep. var. mean | 5.571 | 5.580 | 5.081 | 3.922 | 5.403 |
| Person-Year observations | 39,287 | 39,287 | 39,287 | 39,287 | 39,287 |
| Person observations | 25,009 | 25,009 | 25,009 | 25,009 | 25,009 |
| Individual controls | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | |
| District | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 25,009 locals for a total of 39,287 person-year observations for years 2016 and 2018 where all 5 questions used as dependent variables were asked. The dependent variable is locals' opinion about: i) the impact of refugees on: the economy, cultural life, and Germany as a place to live (columns 1 to 3); and, ii) refugees representing a risk in the short and in the long run (columns 4 and 5). Refugee share, in percent, is the refugee share in the district population, measured on December 31st of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized. Positive coefficients indicate a more positive view of refugees. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, highest education among 4 categories, and migration background: none, indirect, 5 years ago or less, 6-10 years, more than 10 years), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6. Locals' response to refugees: Endogamy and counter-mobilization

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | 1[Partner German born] | | | Donated to refugees | Worked on site with refugees | Demonstrated to support refugees |
| | All | Female | Male | | | |
| Refugee share | 0.131 | 0.189 | 0.062 | -2.561** | -0.519 | 0.575 |
| | (0.258) | (0.360) | (0.361) | (1.134) | (0.726) | (0.636) |
| Refugee share × Threat | 0.249 | 0.465** | -0.009 | 0.644 | 0.232 | -0.560 |
| | (0.159) | (0.211) | (0.227) | (0.630) | (0.409) | (0.375) |
| R2 adjusted | 0.072 | 0.130 | 0.070 | 0.151 | 0.059 | 0.049 |
| Dep. var. mean | 0.944 | 0.951 | 0.937 | 0.293 | 0.071 | 0.057 |
| Person-Year observations | 92,813 | 43,409 | 49,404 | 22,382 | 22,330 | 22,306 |
| Person observations | 20,016 | 9,200 | 10,816 | 12,696 | 12,685 | 12,680 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is i) a dummy for having a German-born partner (columns 1 to 3); and, ii) donating to support refugees, working on-site with refugees, and demonstrating to support refugees the previous year (columns 4, 5, and 6). Sample is restricted to German-born individuals. Refugee share refers to the percent of refugees in the district measured on December 31 of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized within each model. Coefficients and standard errors are multiplied by 100 for presentation. Each column from 4 to 6 control for the baseline frequency of volunteering in associations (1 never - 5 daily) and for the baseline importance of engaging politically and socially (1 not important- 4 very important). All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, highest education among 4 categories, and migration background: none, indirect, 5 years ago or less, 6-10 years, more than 10 years), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

# Online Appendix

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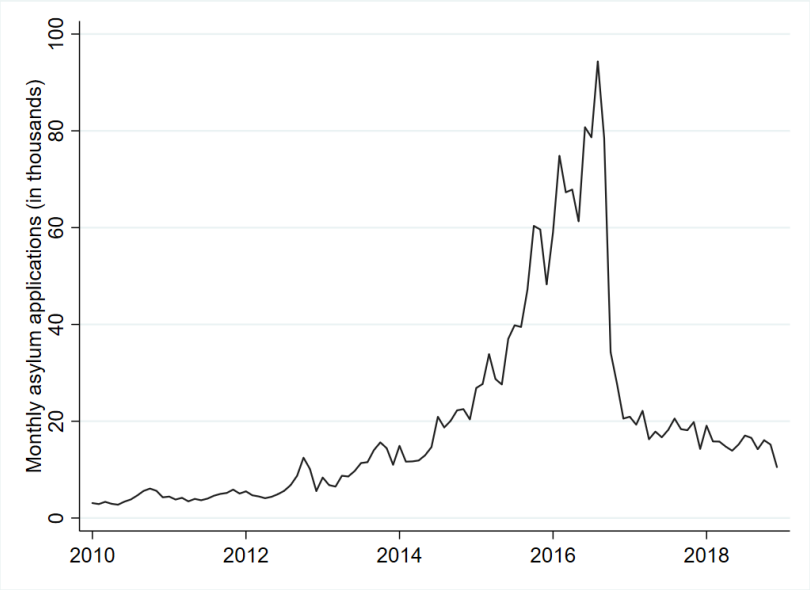
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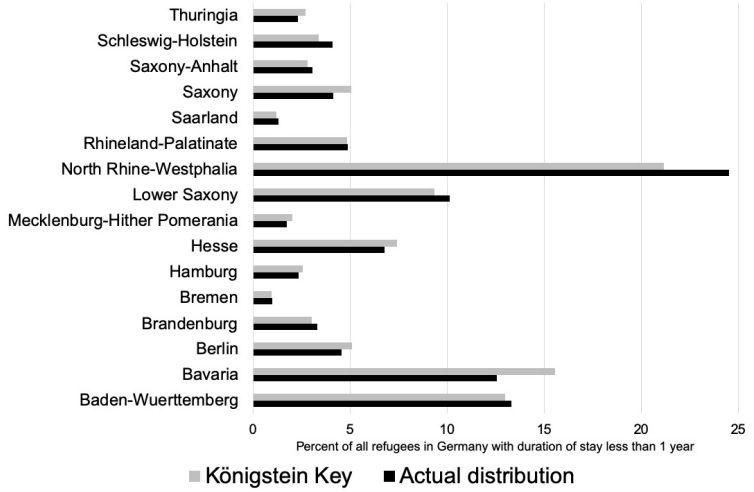
# Appendix A: Additional Figures and Tables

Figure A.1. Monthly asylum applications in Germany (in thousands)



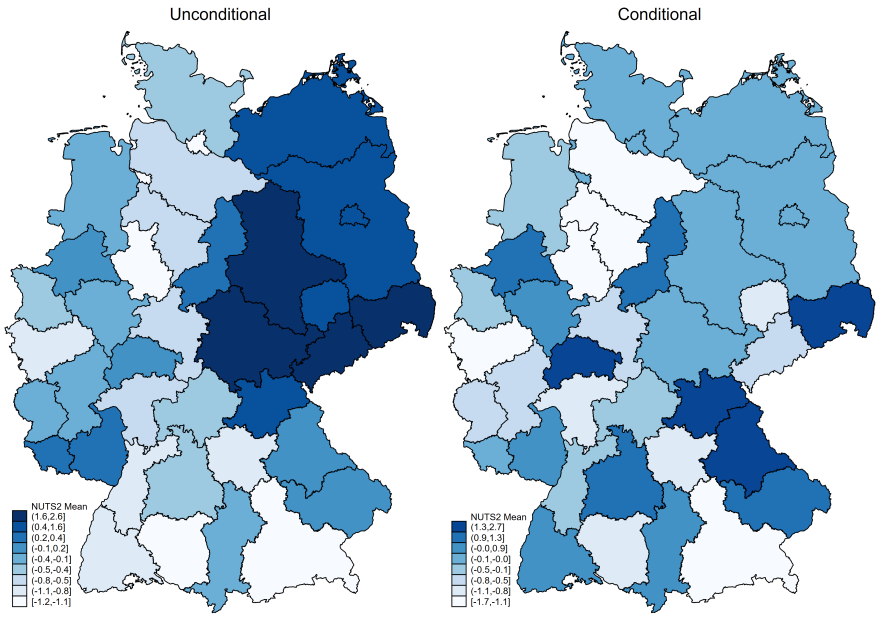

*Notes:* The graph plots the number of monthly asylum applications in Germany by month. Asylum applicants are adult individuals from outside the EU-28, who may have also applied for asylum in other EU countries. *Source:* Authors' calculation from Eurostat (2021).

Figure A.2. Refugee assignment quotas vs actual refugee allocation across German states




*Notes:*: The graph plots the assignment quotas (in gray bars) and the actual distribution of refugees with duration of stay less than one year (in black bars) for each German state in 2016. *Source:* Calculation of the authors from Destatis (2021, Tab-12531-0025) and Bundesanzeiger (2016).

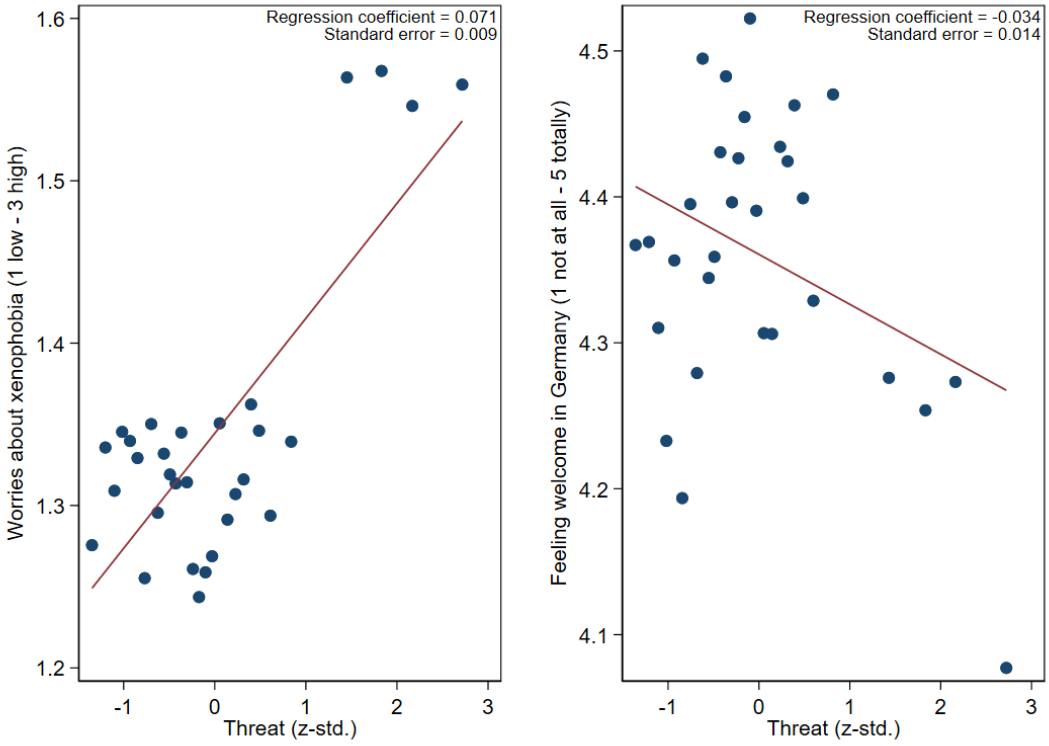
Figure A.3. Conditional and unconditional threat map across NUTS-2 regions



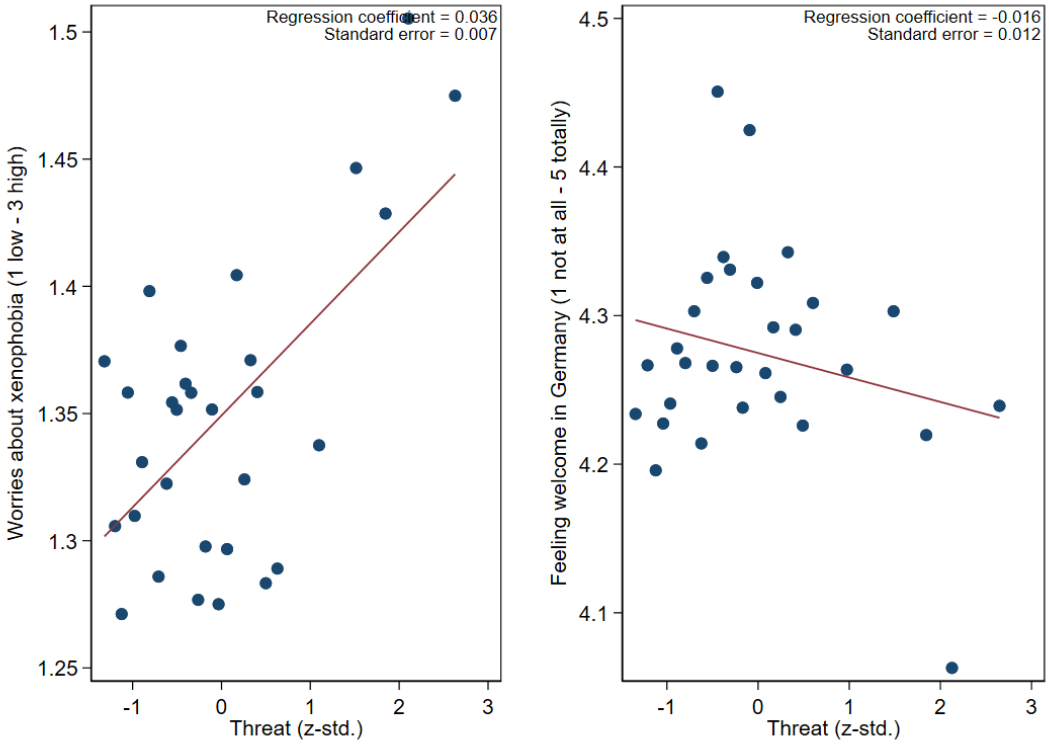

*Notes:* The maps plot the unconditional (left) and conditional (right) z-standardized threat index described in the text for each of the 38 NUTS-2 regions. Conditional means partial out Federal State fixed effects.

Figure A.4. Validation of threat: Perception of threat by gender

Panel A. Women

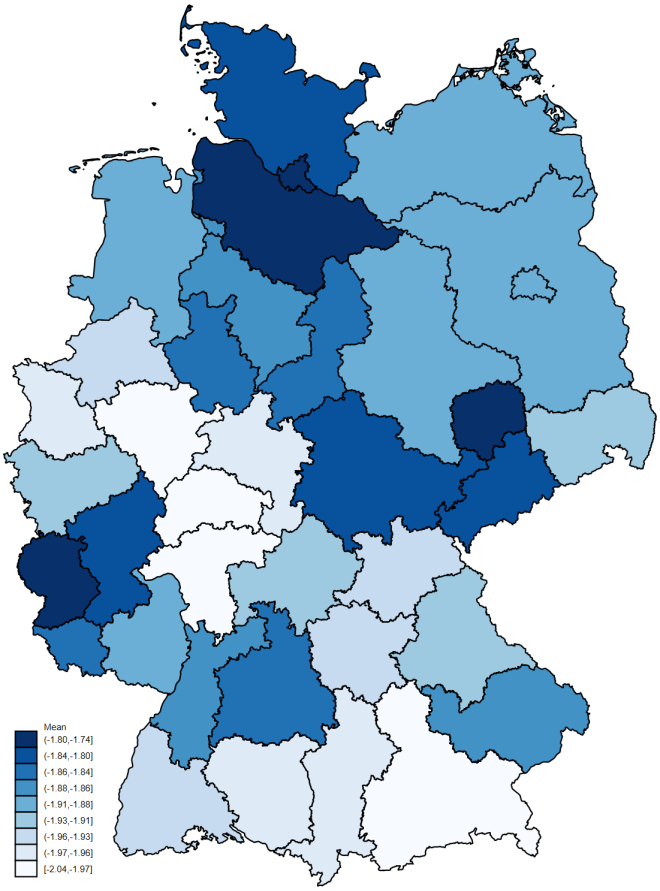



Panel B. Men



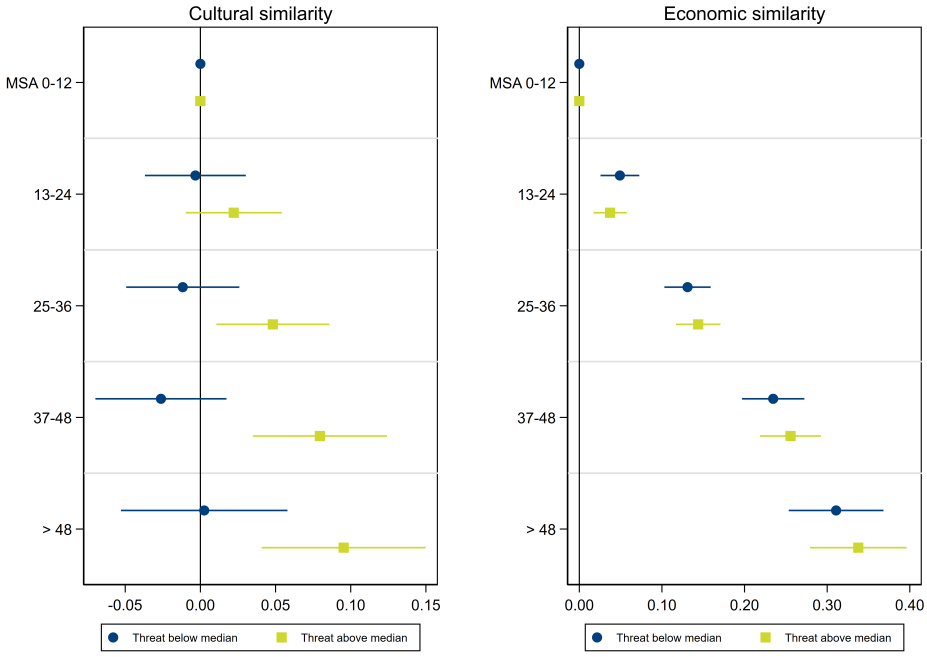

*Notes:*Binned scatterplot of the relationship between the threat index described in the main text and female (resp. male) refugees' self-reported worry about xenophobia (left panel) and feeling welcome in Germany (right panel). Variables on the x- and y-axes represent residual changes, after partialling out months since arrival, survey year dummies, and individual controls (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status, and location of partner as well as work experience and education upon arrival).

Figure A.5. Cultural similarity between refugees and locals




*Notes:* The map plots the cultural similarity index between refugees and locals for each of the 38 NUTS-2 regions.

Figure A.6. Cultural and economic assimilation by arrival cohorts




*Notes:* The figure compares cultural similarity (resp. economic assimilation in terms of employment similarity) of refugees from different arrival cohorts in the presence of above versus below median threat. Threat is defined as in the main analysis. The figure plots the coefficients of 12-months bins for months since arrival (MSA) from separate regressions for the below and above median sample in terms of threat. The mean value of cultural similarity is -1.90 (resp. -1.92) for refugees in regions with threat below (resp. above) the median. The mean value of economic assimilation is -0.50 (resp. -0.51) for refugees in regions with threat below (resp. above) the median

Table A.1. Locals' cultural traits and other beliefs

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Risk | Negative Reciprocity | Positive Reciprocity | Leisure activities | Politics | Locus of control | Trust | Egoistic society |
| | *Panel A: Political preferences and attitudes* | | | | | | | |
| Satisfaction German democracy (0-10) | 0.006 | -0.138*** | 0.052*** | 0.221*** | 0.105*** | 0.228*** | 0.303*** | 0.253*** |
| mean: 5.612 | [0.772] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Voted in the last German parliamentary election | -0.022* | -0.089*** | 0.026* | 0.231*** | 0.375*** | 0.139*** | 0.185*** | 0.122*** |
| mean: 0.809 | [0.059] | [0.009] | [0.079] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Concern: The impact of climate change | -0.017*** | -0.064*** | 0.062*** | 0.079*** | 0.134*** | -0.013*** | 0.031*** | 0.022*** |
| mean: 1.144 | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Concern: Immigration to Germany | -0.006 | 0.133*** | -0.004 | -0.181*** | -0.111*** | -0.176*** | -0.294*** | -0.198*** |
| mean: 0.986 | [0.178] | [0.009] | [0.336] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Political attitudes (0 left - 10 right) | 0.029*** | 0.101*** | -0.010 | -0.076*** | -0.041*** | -0.028*** | -0.133*** | -0.082*** |
| mean: 4.634 | [0.009] | [0.009] | [0.188] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| | *Panel B: Cultural preferences* | | | | | | | |
| Good that gay marriage is recognized | 0.0201 | -0.092*** | 0.022* | 0.180*** | 0.084*** | 0.136*** | 0.186*** | 0.119*** |
| mean: 5.086 | [0.138] | [0.009] | [0.099] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Best if man and woman work the same | 0.009 | -0.017 | 0.042*** | -0.029*** | 0.007 | -0.026** | -0.025*** | -0.004 |
| mean: 5.375 | [0.772] | [0.168] | [0.009] | [0.009] | [0.564] | [0.029] | [0.009] | [0.762] |
| Children under 6 suffer if the mother works | 0.018 | 0.062*** | 0.025** | -0.128*** | -0.076*** | -0.125*** | -0.152*** | -0.100*** |
| mean: 3.441 | [0.178] | [0.009] | [0.049] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| How often do you attend religious events | -0.048*** | -0.105*** | 0.010 | 0.146*** | 0.084*** | 0.037*** | 0.130*** | 0.103*** |
| mean: 1.657 | [0.009] | [0.009] | [0.247] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Not a member of any religious community | 0.059*** | 0.061*** | -0.028*** | -0.057*** | 0.032*** | 0.004 | -0.060*** | -0.059*** |
| mean: 0.359 | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.802] | [0.009] | [0.009] |
| | *Panel C: Preferences for redistribution and altruism* | | | | | | | |
| Blood donations last 10 years | 0.050*** | 0.004 | 0.025* | 0.126*** | 0.023* | 0.073*** | 0.069*** | 0.043*** |
| mean: 0.174 | [0.009] | [0.851] | [0.079] | [0.009] | [0.089] | [0.009] | [0.009] | [0.009] |
| Amount given away if received 10,000€ gift | -0.031*** | -0.092*** | 0.070*** | 0.022*** | 0.063*** | 0.009 | 0.049*** | 0.057*** |
| mean: 1.406 | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.584] | [0.009] | [0.009] |
| Fair that those who work harder earn more | 0.025** | 0.016 | 0.118*** | -0.052*** | 0.015 | 0.048*** | -0.077*** | -0.051*** |
| mean: 6.265 | [0.019] | [0.257] | [0.009] | [0.009] | [0.188] | [0.009] | [0.009] | [0.009] |
| Fair when income and wealth distributed equally | -0.011 | 0.043*** | -0.034** | -0.088*** | -0.101*** | -0.165*** | -0.043*** | -0.043*** |
| mean: 3.175 | [0.663] | [0.009] | [0.019] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Observations | 1,675,316 | 1,675,325 | 1,675,328 | 1,675,375 | 1,675,303 | 1,675,306 | 1,675,378 | 1,675,376 |
| Dep. var. mean | 4.79 | 2.81 | 5.85 | 2.18 | 2.27 | 4.64 | 2.39 | 1.49 |

*Notes:* The table reports Pearson correlation coefficients between the cultural trait reported at the top of each column and the corresponding preference reported in each row. The sample consists of non-refugee SOEP respondents, interviewed between 2010 and 2019 (see Table C.5 for exact wording and survey years of questions). The variable *"How much would you give away if received a gift 10,000 euros?"* was re-scaled to be in thousands of euros. Regression coefficients (not shown) both including individual controls (marital status, gender, employment status, education, age, household income, nativity and survey year fixed effects) and not including individual controls are very similar. All significance levels are adjusted for the multiple hypothesis testing using Romano-Wolf p-values (reported in square brackets). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

# Table A.2. Descriptive statistics

| | All | | | | | Below median threat | | | | | Above median threat | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N |
| | *Panel A. Refugees* | | | | | | | | | | | | | | |
| **Main variables** | | | | | | | | | | | | | | | |
| Cultural similarity index | -1.91 | 0.47 | -5 | -1 | 12,334 | -1.90 | 0.46 | -5 | -1 | 6,022 | -1.92 | 0.48 | -5 | -1 | 6,312 |
| Months since arrival to Germany | 28.96 | 13.12 | 0 | 72 | 12,334 | 29.42 | 13.15 | 0 | 72 | 6,022 | 28.51 | 13.07 | 0 | 72 | 6,312 |
| Employment similarity | -0.51 | 0.38 | -1 | 0 | 12,334 | -0.50 | 0.39 | -1 | 0 | 6,022 | -0.51 | 0.38 | -1 | 0 | 6,312 |
| **Additional outcomes** | | | | | | | | | | | | | | | |
| Wage gap (based on survey) | -810.11 | 939.21 | -1,926 | 13,075 | 2,201 | -784.32 | 984.00 | -1,926 | 13,075 | 1,124 | -837.03 | 889.73 | -1,926 | 8,148 | 1,077 |
| Mandatory integration course | 0.53 | 0.50 | 0 | 1 | 12,243 | 0.53 | 0.50 | 0 | 1 | 5,983 | 0.54 | 0.50 | 0 | 1 | 6,260 |
| Voluntary integration course | 0.56 | 0.50 | 0 | 1 | 12,101 | 0.55 | 0.50 | 0 | 1 | 5,935 | 0.56 | 0.50 | 0 | 1 | 6,166 |
| Time spent with Germans (1 never - 6 daily) | 3.72 | 1.88 | 1 | 6 | 12,302 | 3.75 | 1.88 | 1 | 6 | 6,007 | 3.69 | 1.88 | 1 | 6 | 6,295 |
| Partner German born | 0.14 | 0.35 | 0 | 1 | 2,171 | 0.15 | 0.35 | 0 | 1 | 1,050 | 0.13 | 0.34 | 0 | 1 | 1,121 |
| Worried about xenophobia (1 low - 3 high) | 1.35 | 0.60 | 1 | 3 | 12,124 | 1.33 | 0.58 | 1 | 3 | 5,921 | 1.37 | 0.62 | 1 | 3 | 6,203 |
| Language skills:(1 bad - 5 good, interviewer) | 3.01 | 1.37 | 1 | 5 | 12,334 | 3.05 | 1.35 | 1 | 5 | 6,022 | 2.98 | 1.39 | 1 | 5 | 6,312 |
| **Additional characteristics** | | | | | | | | | | | | | | | |
| Country of birth: | | | | | | | | | | | | | | | |
| Syria | 0.53 | 0.50 | 0 | 1 | 12,334 | 0.50 | 0.50 | 0 | 1 | 6,022 | 0.56 | 0.50 | 0 | 1 | 6,312 |
| Afghanistan | 0.12 | 0.32 | 0 | 1 | 12,334 | 0.13 | 0.33 | 0 | 1 | 6,022 | 0.11 | 0.32 | 0 | 1 | 6,312 |
| Iraq | 0.13 | 0.33 | 0 | 1 | 12,334 | 0.15 | 0.35 | 0 | 1 | 6,022 | 0.11 | 0.32 | 0 | 1 | 6,312 |
| Germany | 0.00 | 0.00 | 0 | 0 | 12,334 | 0.00 | 0.00 | 0 | 0 | 6,022 | 0.00 | 0.00 | 0 | 0 | 6,312 |
| Other | 0.22 | 0.41 | 0 | 1 | 12,334 | 0.22 | 0.42 | 0 | 1 | 6,022 | 0.21 | 0.41 | 0 | 1 | 6,312 |
| Gender: female | 0.38 | 0.49 | 0 | 1 | 12,334 | 0.39 | 0.49 | 0 | 1 | 6,022 | 0.38 | 0.48 | 0 | 1 | 6,312 |
| Age | 34.01 | 10.22 | 18 | 66 | 12,334 | 33.79 | 10.29 | 18 | 66 | 6,022 | 34.22 | 10.14 | 18 | 66 | 6,312 |
| School certificate: | | | | | | | | | | | | | | | |
| None | 0.44 | 0.50 | 0 | 1 | 12,279 | 0.47 | 0.50 | 0 | 1 | 5,994 | 0.42 | 0.49 | 0 | 1 | 6,285 |
| Compulsory school leaving certificate | 0.24 | 0.43 | 0 | 1 | 12,279 | 0.22 | 0.41 | 0 | 1 | 5,994 | 0.25 | 0.44 | 0 | 1 | 6,285 |
| Secondary school leaving certificate | 0.32 | 0.47 | 0 | 1 | 12,279 | 0.31 | 0.46 | 0 | 1 | 5,994 | 0.33 | 0.47 | 0 | 1 | 6,285 |
| | *Panel B. Locals* | | | | | | | | | | | | | | |
| Cultural similarity index | -1.46 | 0.65 | -6 | -1 | 8,416 | -1.46 | 0.66 | -6 | -1 | 4,124 | -1.45 | 0.64 | -6 | -1 | 4,292 |
| **Additional outcomes** | | | | | | | | | | | | | | | |
| Gender: female | 0.55 | 0.50 | 0 | 1 | 94,129 | 0.55 | 0.50 | 0 | 1 | 48,003 | 0.55 | 0.50 | 0 | 1 | 46,126 |
| Age | 41.84 | 12.51 | 18 | 66 | 94,129 | 41.56 | 12.33 | 18 | 66 | 48,003 | 42.13 | 12.70 | 18 | 66 | 46,126 |
| Country of birth: | | | | | | | | | | | | | | | |
| Germany | 0.85 | 0.36 | 0 | 1 | 94,110 | 0.81 | 0.39 | 0 | 1 | 47,993 | 0.88 | 0.32 | 0 | 1 | 46,117 |
| Other | 0.15 | 0.36 | 0 | 1 | 94,110 | 0.19 | 0.39 | 0 | 1 | 47,993 | 0.12 | 0.32 | 0 | 1 | 46,117 |
| Highest education: | | | | | | | | | | | | | | | |
| Lower secondary | 0.14 | 0.34 | 0 | 1 | 93,310 | 0.15 | 0.35 | 0 | 1 | 47,540 | 0.13 | 0.33 | 0 | 1 | 45,770 |
| Short cycle non-tertiary | 0.63 | 0.48 | 0 | 1 | 93,310 | 0.61 | 0.49 | 0 | 1 | 47,540 | 0.65 | 0.48 | 0 | 1 | 45,770 |
| Bachelors or higher | 0.23 | 0.42 | 0 | 1 | 93,310 | 0.25 | 0.43 | 0 | 1 | 47,540 | 0.22 | 0.42 | 0 | 1 | 45,770 |
| School certificate: | | | | | | | | | | | | | | | |
| None | 0.11 | 0.32 | 0 | 1 | 92,085 | 0.14 | 0.34 | 0 | 1 | 46,911 | 0.09 | 0.29 | 0 | 1 | 45,174 |
| Compulsory school leaving certificate | 0.01 | 0.11 | 0 | 1 | 92,085 | 0.01 | 0.11 | 0 | 1 | 46,911 | 0.01 | 0.11 | 0 | 1 | 45,174 |
| Secondary school leaving certificate | 0.87 | 0.33 | 0 | 1 | 92,085 | 0.85 | 0.36 | 0 | 1 | 46,911 | 0.90 | 0.30 | 0 | 1 | 45,174 |
| | *Panel C. District-level and NUTS-2-level variables* | | | | | | | | | | | | | | |
| Unemployment rate (district, Dec-2012) | 6.87 | 2.98 | 1 | 16 | 12,334 | 6.07 | 2.62 | 1 | 14 | 6,022 | 7.63 | 3.09 | 2 | 16 | 6,312 |
| Population density (district, Dec-2012) | 960.55 | 1,114 | 38 | 4,468 | 12,334 | 1,075 | 1,098 | 40 | 4,468 | 6,022 | 851.63 | 1,119 | 38 | 3,785 | 6,312 |
| Share of refugees (district, Dec-2012) | 0.75 | 0.37 | 0 | 2 | 12,334 | 0.85 | 0.40 | 0 | 2 | 6,022 | 0.65 | 0.30 | 0 | 2 | 6,312 |
| Threat principal component (NUTS-2) | 0.00 | 2.04 | -3 | 6 | 12,334 | -1.55 | 0.62 | -3 | -1 | 6,022 | 1.48 | 1.82 | -1 | 6 | 6,312 |

*Notes:* The table reports summary statistics for the refugees (Panel A) and locals (Panel B) for: i) the full sample in columns 1 to 5; and, ii) separately for regions with the threat index above (resp. below) the sample median in columns 6 to 10 (resp. in columns 11 to 15). Panel C reports summary statistics for the main district-level variables used as controls in the analysis. The threat index is defined at the regional level (see Section 3.2). Language skills refer to ability to read, write, and speak in German. See Table A.3 for descriptives of variables not included here.

# Table A.3. Detailed variable list: Summary statistics

| | All | | | | | Below median threat | | | | | Above median threat | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N |
| | *Panel A. Refugees* | | | | | | | | | | | | | | |
| **Preferences: Core cultural similarity** | | | | | | | | | | | | | | | |
| Risk preferences (0 low - 10 high) | 3.95 | 3.42 | 0 | 10 | 11,837 | 3.90 | 3.38 | 0 | 10 | 5,795 | 4.00 | 3.46 | 0 | 10 | 6,042 |
| Negative reciprocity (1 low - 7 high) | 1.77 | 1.26 | 1 | 7 | 6,263 | 1.76 | 1.25 | 1 | 7 | 3,120 | 1.78 | 1.28 | 1 | 7 | 3,143 |
| Positive reciprocity (1 low - 7 high) | 6.68 | 0.62 | 1 | 7 | 6,390 | 6.66 | 0.64 | 1 | 7 | 3,176 | 6.70 | 0.60 | 1 | 7 | 3,214 |
| Locus of control (1 low - 7 high) | 4.42 | 0.78 | 2 | 7 | 2,666 | 4.36 | 0.76 | 2 | 7 | 1,275 | 4.47 | 0.79 | 2 | 7 | 1,391 |
| Society exploit-selfish (=1), fair-helpful (=2) | 1.57 | 0.43 | 1 | 2 | 2,909 | 1.57 | 0.43 | 1 | 2 | 1,427 | 1.56 | 0.42 | 1 | 2 | 1,482 |
| Interest in politics (1 not at all - 4 very strong) | 1.66 | 0.87 | 1 | 4 | 12,227 | 1.66 | 0.87 | 1 | 4 | 5,976 | 1.66 | 0.87 | 1 | 4 | 6,251 |
| Leisure and cultural activ. (1 never - 5 daily) | 1.78 | 0.63 | 1 | 4 | 7,913 | 1.78 | 0.63 | 1 | 4 | 3,954 | 1.77 | 0.62 | 1 | 4 | 3,959 |
| General trust (1 low - 4 high) | 2.17 | 0.59 | 1 | 4 | 3,259 | 2.19 | 0.62 | 1 | 4 | 1,575 | 2.15 | 0.56 | 1 | 4 | 1,684 |
| Cultural similarity index (12-components) | -1.75 | 0.33 | -5 | -1 | 12,334 | -1.74 | 0.32 | -4 | -1 | 6,022 | -1.75 | 0.33 | -5 | -1 | 6,312 |
| Cultural similarity index (to native-born locals) | -1.90 | 0.47 | -5 | -1 | 12,334 | -1.90 | 0.46 | -5 | -1 | 6,022 | -1.91 | 0.48 | -5 | -1 | 6,312 |
| Percentage foreigners in the company | 33.32 | 29.95 | 0 | 100 | 1,143 | 35.82 | 30.47 | 0 | 100 | 533 | 31.14 | 29.33 | 0 | 100 | 610 |
| At least 1 child in hh (born before arrival) | 0.59 | 0.49 | 0 | 1 | 12,081 | 0.58 | 0.49 | 0 | 1 | 5,881 | 0.60 | 0.49 | 0 | 1 | 6,200 |
| Years of work experience before arrival | 7.33 | 9.22 | 0 | 48 | 11,594 | 7.26 | 9.12 | 0 | 47 | 5,635 | 7.39 | 9.32 | 0 | 48 | 5,959 |
| Partner: | | | | | | | | | | | | | | | |
| None | 0.34 | 0.47 | 0 | 1 | 12,132 | 0.36 | 0.48 | 0 | 1 | 5,924 | 0.32 | 0.47 | 0 | 1 | 6,208 |
| Lives in household | 0.58 | 0.49 | 0 | 1 | 12,132 | 0.57 | 0.50 | 0 | 1 | 5,924 | 0.60 | 0.49 | 0 | 1 | 6,208 |
| Lives elsewhere in Germany | 0.01 | 0.11 | 0 | 1 | 12,132 | 0.01 | 0.11 | 0 | 1 | 5,924 | 0.01 | 0.12 | 0 | 1 | 6,208 |
| Lives not in Germany | 0.06 | 0.24 | 0 | 1 | 12,132 | 0.07 | 0.25 | 0 | 1 | 5,924 | 0.06 | 0.24 | 0 | 1 | 6,208 |
| Social inclusion (1 incl. - 5 excl.) | 2.57 | 1.08 | 1 | 5 | 6,240 | 2.55 | 1.07 | 1 | 5 | 3,098 | 2.59 | 1.09 | 1 | 5 | 3,142 |
| Satisfaction with life, health, flat (0 low - 10 high) | 7.22 | 1.84 | 0 | 10 | 12,254 | 7.20 | 1.84 | 0 | 10 | 5,984 | 7.24 | 1.85 | 0 | 10 | 6,270 |
| Worries: econ., health (1 low - 3 high) | 1.83 | 0.58 | 1 | 3 | 12,187 | 1.83 | 0.58 | 1 | 3 | 5,972 | 1.84 | 0.58 | 1 | 3 | 6,215 |
| Positive self-attitude (1 disagree - 7 agree) | 6.29 | 1.18 | 1 | 7 | 6,196 | 6.26 | 1.18 | 1 | 7 | 3,110 | 6.33 | 1.18 | 1 | 7 | 3,086 |
| Employment assimilation (from RecLink, Survey sample) | -0.53 | 0.36 | -1 | 0 | 7,618 | -0.53 | 0.36 | -1 | 0 | 3,620 | -0.53 | 0.36 | -1 | 0 | 3,998 |
| Employment assimilation (from survey, RecLink sample) | -0.49 | 0.40 | -1 | 0 | 7,618 | -0.48 | 0.40 | -1 | 0 | 3,620 | -0.49 | 0.40 | -1 | 0 | 3,998 |
| Refugees' rel. gross wage (from RecLink, Survey sample) | -691.58 | 843.56 | -1,926 | 3,536 | 1,044 | -675.44 | 879.00 | -1,926 | 3,536 | 485 | -705.59 | 812.08 | -1,904 | 3,360 | 559 |
| Refugees' rel. gross wage (from survey, RecLink sample) | -671.39 | 979.13 | -1,926 | 13,075 | 1,044 | -624.55 | 1,131 | -1,926 | 13,075 | 485 | -712.03 | 823.66 | -1,926 | 4,042 | 559 |
| Mobility restriction | 0.69 | 0.46 | 0 | 1 | 9,308 | 0.70 | 0.46 | 0 | 1 | 4,507 | 0.68 | 0.47 | 0 | 1 | 4,801 |
| Assigned to East Germany | 0.19 | 0.39 | 0 | 1 | 12,334 | 0 | 0 | 0 | 0 | 6,022 | 0.38 | 0.48 | 0 | 1 | 6,312 |
| Does not live in assigned region at interview time | 0.25 | 0.43 | 0 | 1 | 12,334 | 0.25 | 0.43 | 0 | 1 | 6,022 | 0.25 | 0.43 | 0 | 1 | 6,312 |
| Asylum status: | | | | | | | | | | | | | | | |
| Approved | 0.68 | 0.47 | 0 | 1 | 12,334 | 0.66 | 0.47 | 0 | 1 | 6,022 | 0.70 | 0.46 | 0 | 1 | 6,312 |
| Rejected | 0.10 | 0.30 | 0 | 1 | 12,334 | 0.12 | 0.32 | 0 | 1 | 6,022 | 0.08 | 0.28 | 0 | 1 | 6,312 |
| In proceedings | 0.15 | 0.35 | 0 | 1 | 12,334 | 0.16 | 0.36 | 0 | 1 | 6,022 | 0.14 | 0.34 | 0 | 1 | 6,312 |
| Other or missing | 0.07 | 0.26 | 0 | 1 | 12,334 | 0.07 | 0.25 | 0 | 1 | 6,022 | 0.08 | 0.26 | 0 | 1 | 6,312 |
| | *Panel B. Locals* | | | | | | | | | | | | | | |
| **Preferences: Core cultural similarity** | | | | | | | | | | | | | | | |
| Risk preferences (0 low - 10 high) | 4.99 | 2.23 | 0 | 10 | 22,612 | 4.95 | 2.25 | 0 | 10 | 11,415 | 5.03 | 2.22 | 0 | 10 | 11,197 |
| Negative reciprocity (1 low - 7 high) | 3.08 | 1.41 | 1 | 7 | 14,321 | 3.04 | 1.38 | 1 | 7 | 6,975 | 3.13 | 1.43 | 1 | 7 | 7,346 |
| Positive reciprocity (1 low - 7 high) | 5.83 | 0.90 | 1 | 7 | 14,352 | 5.85 | 0.90 | 1 | 7 | 6,989 | 5.82 | 0.90 | 1 | 7 | 7,363 |
| Locus of control (1 low - 7 high) | 4.63 | 0.72 | 1 | 7 | 14,045 | 4.67 | 0.72 | 1 | 7 | 6,848 | 4.59 | 0.71 | 2 | 7 | 7,197 |
| Society exploit-selfish (=1), fair-helpful (=2) | 1.49 | 0.42 | 1 | 2 | 20,160 | 1.52 | 0.42 | 1 | 2 | 10,111 | 1.47 | 0.42 | 1 | 2 | 10,049 |
| Interest in politics (1 not at all - 4 very strong) | 2.30 | 0.79 | 1 | 4 | 15,639 | 2.34 | 0.79 | 1 | 4 | 7,732 | 2.26 | 0.80 | 1 | 4 | 7,907 |
| Leisure and cultural activ. (1 never - 5 daily) | 2.18 | 0.61 | 1 | 4 | 20,697 | 2.25 | 0.60 | 1 | 4 | 10,374 | 2.12 | 0.61 | 1 | 4 | 10,323 |
| General trust (1 low - 4 high) | 2.38 | 0.54 | 1 | 4 | 20,721 | 2.42 | 0.53 | 1 | 4 | 10,404 | 2.33 | 0.54 | 1 | 4 | 10,317 |

Table A.3. Continued

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| School degree: | | | | | | | | | | | | | | | |
| None | 0.04 | 0.20 | 0 | 1 | 92,382 | 0.05 | 0.21 | 0 | 1 | 47,090 | 0.04 | 0.19 | 0 | 1 | 45,292 |
| Secondary school certificate | 0.56 | 0.50 | 0 | 1 | 92,382 | 0.50 | 0.50 | 0 | 1 | 47,090 | 0.62 | 0.49 | 0 | 1 | 45,292 |
| Higher education entrance qualification | 0.30 | 0.46 | 0 | 1 | 92,382 | 0.33 | 0.47 | 0 | 1 | 47,090 | 0.27 | 0.45 | 0 | 1 | 45,292 |
| Other | 0.10 | 0.29 | 0 | 1 | 92,382 | 0.12 | 0.32 | 0 | 1 | 47,090 | 0.07 | 0.26 | 0 | 1 | 45,292 |
| Locals' attitudes towards refugees: | | | | | | | | | | | | | | | |
| Impact refugees on the economy (1 bad - 11 good) | 5.57 | 2.70 | 1 | 11 | 39,769 | 5.76 | 2.68 | 1 | 11 | 20,492 | 5.38 | 2.70 | 1 | 11 | 19,277 |
| Impact refugees on cultural life (1 undermine - 11 enrich) | 5.59 | 2.79 | 1 | 11 | 39,769 | 5.83 | 2.77 | 1 | 11 | 20,492 | 5.32 | 2.80 | 1 | 11 | 19,277 |
| Impact refugees on Germany as place to live (1 worse - 11 better) | 5.09 | 2.51 | 1 | 11 | 39,769 | 5.30 | 2.47 | 1 | 11 | 20,492 | 4.86 | 2.52 | 1 | 11 | 19,277 |
| Refugees risk or chance, short-run (1 risk - 11 chance) | 3.93 | 2.30 | 1 | 11 | 39,769 | 4.06 | 2.31 | 1 | 11 | 20,492 | 3.78 | 2.28 | 1 | 11 | 19,277 |
| Refugees risk or chance, long-run (1 risk - 11 chance) | 5.41 | 2.89 | 1 | 11 | 39,769 | 5.67 | 2.87 | 1 | 11 | 20,492 | 5.13 | 2.90 | 1 | 11 | 19,277 |
| Donated last year to support refugees | 0.26 | 0.44 | 0 | 1 | 40,581 | 0.29 | 0.45 | 0 | 1 | 20,957 | 0.23 | 0.42 | 0 | 1 | 19,624 |
| Worked on site with refugees last year | 0.08 | 0.27 | 0 | 1 | 40,518 | 0.08 | 0.28 | 0 | 1 | 20,917 | 0.07 | 0.25 | 0 | 1 | 19,601 |
| Demonstrated last year to support refugees | 0.05 | 0.22 | 0 | 1 | 40,481 | 0.05 | 0.22 | 0 | 1 | 20,906 | 0.05 | 0.22 | 0 | 1 | 19,575 |
| Importance to engage politically, socially (1 not - 4 very important) | 2.13 | 0.77 | 1 | 4 | 45,490 | 2.16 | 0.77 | 1 | 4 | 22,931 | 2.09 | 0.77 | 1 | 4 | 22,559 |
| Frequency volunteering in associations (1 never - 5 daily) | 1.64 | 1.04 | 1 | 5 | 107,973 | 1.67 | 1.07 | 1 | 5 | 53,681 | 1.60 | 1.01 | 1 | 5 | 54,288 |
| Cultural similarity index (12-components) | -1.41 | 0.37 | -4 | -1 | 8,419 | -1.41 | 0.38 | -4 | -1 | 4,126 | -1.41 | 0.37 | -3 | -1 | 4,293 |
| Changed NUTS-2 from previous to current survey year | 0.01 | 0.12 | 0 | 1 | 80,171 | 0.02 | 0.12 | 0 | 1 | 40,537 | 0.01 | 0.12 | 0 | 1 | 39,634 |
| | *Panel C. NUTS-2-level variables* | | | | | | | | | | | | | | |
| Share of refugees (NUTS-2) | 0.68 | 0.25 | 0 | 1 | 12,334 | 0.78 | 0.23 | 0 | 1 | 6,022 | 0.59 | 0.23 | 0 | 1 | 6,312 |
| Immigrants from origin country (NUTS-2) | 0.07 | 0.11 | 0 | 3 | 12,333 | 0.09 | 0.14 | 0 | 3 | 6,022 | 0.06 | 0.06 | 0 | 2 | 6,311 |
| Immigrants from origin region (NUTS-2) | 0.50 | 0.42 | 0 | 3 | 12,053 | 0.54 | 0.28 | 0 | 2 | 5,882 | 0.47 | 0.52 | 0 | 3 | 6,171 |
| Local-national cultural distance (NUTS-2) | 0.32 | 0.14 | 0 | 1 | 12,334 | 0.31 | 0.08 | 0 | 0 | 6,022 | 0.33 | 0.18 | 0 | 1 | 6,312 |
| Local cultural dispersion (NUTS-2) | 1.08 | 0.03 | 1 | 1 | 12,334 | 1.08 | 0.03 | 1 | 1 | 6,022 | 1.09 | 0.03 | 1 | 1 | 6,312 |
| Employment rate of immigrants from origin region (NUTS-2) | 21.51 | 7.06 | 4 | 45 | 12,053 | 24.58 | 6.60 | 12 | 41 | 5,882 | 18.59 | 6.20 | 4 | 45 | 6,171 |
| Skill-req. Herfindahl-Index (NUTS-2, 2012) | 0.41 | 0.03 | 0 | 0 | 12,334 | 0.39 | 0.02 | 0 | 0 | 6,022 | 0.42 | 0.02 | 0 | 0 | 6,312 |
| Task Herfindahl-Index (NUTS-2, 2012) | 0.22 | 0.01 | 0 | 0 | 12,334 | 0.22 | 0.01 | 0 | 0 | 6,022 | 0.22 | 0.01 | 0 | 0 | 6,312 |
| All tweets and retweets in German | 870.53 | 2,228 | 0 | 22,937 | 134,292 | 824.21 | 1,463 | 0 | 8,898 | 64,464 | 913.29 | 2,751 | 0 | 22,937 | 69,828 |
| All tweets and retweets in German per 100,000 people (prev. year) | 30.60 | 70.67 | 0 | 661.04 | 134,292 | 25.00 | 48.41 | 0 | 505 | 64,464 | 35.78 | 85.95 | 0 | 661.04 | 69,828 |
| All *#RefugeesWelcome* per 100,000 total Tweets and retweets (NUTS-2-year) | 32.28 | 50.22 | 0 | 279.0 | 134,292 | 26.16 | 36.84 | 0 | 156 | 64,464 | 37.94 | 59.43 | 0 | 279 | 69,828 |
| All *#RefugeesWelcome* per 100,000 users (NUTS-2-year) | 72,656 | 115,558 | 0 | 577,714 | 134,292 | 58,738 | 86,057 | 0 | 366,324 | 64,464 | 85,505 | 136,018 | 0 | 577,714 | 69,828 |
| NGO-led initiatives: Number (NUTS-2) | 18.17 | 21.19 | 0 | 94 | 25,092 | 22.86 | 21.59 | 0 | 94 | 12,458 | 13.54 | 19.71 | 0 | 54 | 12,634 |
| NGO-led initiatives: Per 100,000 people (NUTS-2) | 0.63 | 0.83 | 0 | 5.42 | 25,092 | 0.76 | 1.01 | 0 | 5.42 | 12,458 | 0.50 | 0.57 | 0 | 1.72 | 12,634 |

*Notes:* The table reports additional summary statistics for the refugees (resp. locals) in Panel A (resp. Panel B) for: i) the full sample in columns 1 to 5; and, ii) separately for regions with the threat index above (resp. below) the sample median in columns 6 to 10 (resp. in columns 11 to 15). Panel C reports summary statistics for additional NUTS-2-level variables used in the analysis. Summary statistics on employment assimilation and relative wages in self-reported survey data, and from linked administrative data (RecLink, see Section C.2.1) refer to the subsample where both these sources are available.

Table A.4. Cultural convergence and local threat: All coefficients

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Cultural similarity index (mean: -1.912) | | | | | |
| MSA | 0.120*** | 0.128*** | 0.127*** | 0.129*** | 0.129*** | 0.129*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat | | 0.087*** | 0.074*** | 0.090*** | 0.095*** | 0.082*** |
| | | (0.026) | (0.028) | (0.026) | (0.027) | (0.031) |
| Female | -5.282*** | -5.242*** | -5.245*** | -5.223*** | -5.231*** | -5.229*** |
| | (0.847) | (0.847) | (0.847) | (0.847) | (0.848) | (0.848) |
| At least 1 child in hh | 1.147 | 1.139 | 1.144 | 1.164 | 1.144 | 1.176 |
| (born before arrival of hh head) | (0.910) | (0.910) | (0.910) | (0.910) | (0.910) | (0.910) |
| Age | -0.291 | -0.286 | -0.285 | -0.289 | -0.285 | -0.290 |
| | (0.248) | (0.248) | (0.248) | (0.248) | (0.248) | (0.248) |
| Age squared | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Partner lives in: | | | | | | |
| Household | -2.658** | -2.735*** | -2.737*** | -2.766*** | -2.749*** | -2.768*** |
| | (1.061) | (1.061) | (1.060) | (1.061) | (1.061) | (1.061) |
| Elsewhere in Germany | 0.988 | 0.932 | 0.926 | 0.856 | 0.832 | 0.895 |
| | (3.174) | (3.163) | (3.164) | (3.162) | (3.165) | (3.162) |
| Not in Germany | -2.427 | -2.378 | -2.386 | -2.427 | -2.387 | -2.428 |
| | (1.705) | (1.703) | (1.704) | (1.702) | (1.703) | (1.703) |
| Missing | -3.827 | -3.841 | -3.865 | -3.825 | -3.873 | -3.816 |
| | (2.676) | (2.679) | (2.682) | (2.684) | (2.682) | (2.684) |
| Work exp. bef. leaving home country | -0.024 | -0.023 | -0.023 | -0.022 | -0.023 | -0.023 |
| | (0.058) | (0.058) | (0.058) | (0.058) | (0.058) | (0.058) |
| Compulsory school leaving certificate | 4.604*** | 4.606*** | 4.612*** | 4.597*** | 4.603*** | 4.600*** |
| | (0.946) | (0.947) | (0.946) | (0.947) | (0.947) | (0.947) |
| Secondary school leaving certificate | 7.985*** | 7.972*** | 7.972*** | 7.957*** | 7.970*** | 7.967*** |
| | (0.870) | (0.870) | (0.870) | (0.870) | (0.870) | (0.870) |
| Country of birth: | | | | | | |
| Afghanistan | 3.802*** | 3.881*** | 3.869*** | 3.846*** | 3.887*** | 3.838*** |
| | (1.199) | (1.199) | (1.199) | (1.199) | (1.199) | (1.199) |
| Iraq | 0.058 | 0.002 | 0.005 | -0.019 | -0.014 | -0.010 |
| | (1.163) | (1.162) | (1.162) | (1.161) | (1.162) | (1.162) |
| Iran | 12.604*** | 12.558*** | 12.565*** | 12.543*** | 12.555*** | 12.514*** |
| | (2.284) | (2.290) | (2.290) | (2.289) | (2.290) | (2.290) |
| Africa | 5.568*** | 5.548*** | 5.543*** | 5.472*** | 5.549*** | 5.468*** |
| | (1.760) | (1.758) | (1.759) | (1.760) | (1.759) | (1.760) |
| West Balkan | 4.423** | 4.233** | 4.296** | 4.231** | 4.225** | 4.263** |
| | (2.155) | (2.152) | (2.155) | (2.154) | (2.154) | (2.154) |
| Former USSR | 7.285*** | 7.064*** | 7.127*** | 7.015*** | 6.983*** | 7.030*** |
| | (2.373) | (2.378) | (2.373) | (2.380) | (2.378) | (2.371) |
| Eritrea | 2.309 | 2.059 | 2.098 | 1.969 | 1.989 | 2.013 |
| | (2.041) | (2.039) | (2.039) | (2.038) | (2.039) | (2.040) |
| Other | 0.783 | 0.768 | 0.760 | 0.750 | 0.750 | 0.730 |
| | (2.130) | (2.126) | (2.127) | (2.124) | (2.125) | (2.125) |

Table A.4. Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| Refugee answered: | | | | | | |
| Risk | 76.805*** | 76.832*** | 76.827*** | 76.816*** | 76.792*** | 76.870*** |
| | (1.695) | (1.692) | (1.691) | (1.694) | (1.693) | (1.695) |
| Neg. reciprocity | 6.517** | 6.542** | 6.583** | 6.480** | 6.548** | 6.535** |
| | (2.599) | (2.599) | (2.599) | (2.601) | (2.603) | (2.602) |
| Pos. reciprocity | -18.872*** | -18.851*** | -18.868*** | -18.707*** | -18.756*** | -18.759*** |
| | (2.694) | (2.693) | (2.693) | (2.696) | (2.698) | (2.698) |
| Leisure activities | -36.283*** | -36.255*** | -36.264*** | -36.204*** | -36.172*** | -36.324*** |
| | (4.035) | (4.029) | (4.027) | (4.027) | (4.018) | (4.029) |
| Interest in politics | -39.489*** | -39.499*** | -39.576*** | -39.543*** | -39.523*** | -39.642*** |
| | (8.423) | (8.429) | (8.419) | (8.427) | (8.432) | (8.422) |
| Locus of control | -30.547*** | -30.552*** | -30.567*** | -30.559*** | -30.511*** | -30.570*** |
| | (1.445) | (1.445) | (1.445) | (1.445) | (1.445) | (1.445) |
| Trust | -23.729*** | -23.324*** | -23.288*** | -23.314*** | -23.312*** | -23.274*** |
| | (3.999) | (4.001) | (3.997) | (4.001) | (3.999) | (4.005) |
| Evaluation of society | -26.155*** | -26.335*** | -26.334*** | -26.337*** | -26.336*** | -26.293*** |
| | (1.877) | (1.879) | (1.879) | (1.879) | (1.879) | (1.880) |
| Survey year = 2017 | -5.892 | -6.101 | -6.779 | -7.800* | -8.761* | -6.395 |
| | (4.310) | (4.306) | (4.835) | (4.397) | (4.780) | (5.280) |
| Survey year = 2018 | -1.415 | -1.476 | -4.468 | -2.404 | -3.507 | -5.065 |
| | (2.622) | (2.620) | (3.223) | (2.694) | (3.141) | (3.632) |
| Constant | -114.950*** | -113.107*** | -113.713*** | -113.234*** | -112.793*** | -113.224*** |
| | (11.428) | (10.234) | (10.230) | (10.226) | (10.243) | (10.253) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| **Fixed Effects** | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the cultural similarity index. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), and dummies for the composition of questions included in the cultural similarity index. The reference value for country of birth is Syria. Column 3 controls for the interaction of unemployment rate at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 4 controls for the interaction of population density at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 5 controls for the interaction of refugees' share at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 6 includes controls of columns 3, 4, 5 all together. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5. Economic assimilation and local threat: All coefficients

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Refugees' relative employment (mean: -0.507) | | | | | |
| MSA | 0.770*** | 0.768*** | 0.770*** | 0.767*** | 0.768*** | 0.772*** |
| | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat | | -0.019 | -0.002 | -0.021 | -0.011 | 0.016 |
| | | (0.028) | (0.029) | (0.028) | (0.029) | (0.032) |
| Female | -16.628*** | -16.637*** | -16.632*** | -16.647*** | -16.631*** | -16.626*** |
| | (0.836) | (0.836) | (0.836) | (0.836) | (0.836) | (0.837) |
| At least 1 child in HH | -3.986*** | -3.985*** | -3.984*** | -3.998*** | -3.979*** | -3.983*** |
| (born before arrival of hh head) | (0.922) | (0.923) | (0.922) | (0.923) | (0.923) | (0.923) |
| Age | 1.502*** | 1.501*** | 1.496*** | 1.502*** | 1.504*** | 1.503*** |
| | (0.225) | (0.225) | (0.225) | (0.225) | (0.225) | (0.225) |
| Age squared | -0.023*** | -0.023*** | -0.022*** | -0.023*** | -0.023*** | -0.023*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Partner lives in: | | | | | | |
| Household | -6.449*** | -6.432*** | -6.424*** | -6.416*** | -6.429*** | -6.420*** |
| | (1.023) | (1.023) | (1.023) | (1.023) | (1.023) | (1.023) |
| Elsewhere in Germany | -5.150** | -5.136** | -5.099* | -5.095* | -5.150** | -5.154** |
| | (2.599) | (2.602) | (2.610) | (2.607) | (2.600) | (2.608) |
| Not in Germany | 1.126 | 1.115 | 1.121 | 1.141 | 1.128 | 1.160 |
| | (1.722) | (1.722) | (1.721) | (1.722) | (1.722) | (1.721) |
| Missing | -3.028 | -3.025 | -3.014 | -3.033 | -3.013 | -3.001 |
| | (2.622) | (2.623) | (2.621) | (2.624) | (2.625) | (2.624) |
| Work exp. bef. leaving home country | -0.081 | -0.081 | -0.082 | -0.082 | -0.082 | -0.082 |
| | (0.054) | (0.054) | (0.054) | (0.054) | (0.054) | (0.054) |
| Compulsory school leaving certificate | 4.206*** | 4.206*** | 4.195*** | 4.209*** | 4.217*** | 4.207*** |
| | (0.934) | (0.934) | (0.934) | (0.934) | (0.933) | (0.934) |
| Secondary school leaving certificate | 6.166*** | 6.170*** | 6.182*** | 6.176*** | 6.178*** | 6.195*** |
| | (0.894) | (0.895) | (0.895) | (0.895) | (0.895) | (0.895) |
| Country of birth: | | | | | | |
| Afghanistan | -0.463 | -0.480 | -0.444 | -0.463 | -0.460 | -0.399 |
| | (1.152) | (1.152) | (1.152) | (1.152) | (1.152) | (1.152) |
| Iraq | -2.565** | -2.554** | -2.548** | -2.544** | -2.545** | -2.540** |
| | (1.101) | (1.102) | (1.102) | (1.102) | (1.102) | (1.101) |
| Iran | -4.580** | -4.568* | -4.621** | -4.558* | -4.571** | -4.623** |
| | (2.332) | (2.331) | (2.332) | (2.334) | (2.331) | (2.332) |
| Africa | 1.559 | 1.562 | 1.588 | 1.600 | 1.581 | 1.646 |
| | (1.987) | (1.988) | (1.988) | (1.988) | (1.987) | (1.988) |
| West Balkan | 8.880*** | 8.921*** | 8.855*** | 8.924*** | 8.914*** | 8.815*** |
| | (2.866) | (2.864) | (2.866) | (2.864) | (2.864) | (2.867) |
| Former USSR | -1.338 | -1.289 | -1.370 | -1.262 | -1.344 | -1.513 |
| | (2.567) | (2.568) | (2.570) | (2.568) | (2.570) | (2.574) |
| Eritrea | 1.015 | 1.068 | 1.062 | 1.110 | 1.058 | 1.021 |
| | (1.950) | (1.951) | (1.952) | (1.952) | (1.951) | (1.952) |
| Other | 1.466 | 1.469 | 1.474 | 1.479 | 1.466 | 1.458 |
| | (2.112) | (2.112) | (2.111) | (2.112) | (2.114) | (2.114) |

Table A.5. Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| Survey year = 2017 | -0.030 | 0.018 | 4.067** | 0.883 | 0.134 | 2.643 |
| | (0.815) | (0.816) | (1.821) | (1.038) | (1.656) | (2.340) |
| Survey year = 2018 | 0.970 | 1.029 | 4.942** | 1.532 | -0.749 | 1.813 |
| | (1.277) | (1.278) | (2.450) | (1.489) | (2.238) | (3.011) |
| Constant | -71.561*** | -74.670*** | -73.365*** | -74.614*** | -74.568*** | -72.707*** |
| | (11.395) | (9.972) | (9.986) | (9.968) | (9.990) | (10.026) |
| R2 adjusted | 0.179 | 0.179 | 0.180 | 0.179 | 0.179 | 0.180 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| **Fixed Effects** | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is refugees' relative employment. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables and individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). The reference value for country of birth is Syria. Column 3 controls for the interaction of unemployment rate at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 4 controls for the interaction of population density at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 5 controls for the interaction of refugees' share at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 6 includes controls of columns 3, 4, 5 all together. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6. Economic assimilation: Self-reported wages

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Refugees' relative log gross wage (mean: -0.867) | | | | | |
| MSA | 0.789*** | 0.800*** | 0.798*** | 0.799*** | 0.801*** | 0.785*** |
| | (0.280) | (0.280) | (0.279) | (0.279) | (0.279) | (0.279) |
| MSA × Threat | | 0.167 | 0.141 | 0.156 | 0.151 | 0.107 |
| | | (0.222) | (0.228) | (0.222) | (0.226) | (0.238) |
| R2 adjusted | 0.133 | 0.133 | 0.132 | 0.134 | 0.132 | 0.133 |
| Person-Year observations | 2,097 | 2,097 | 2,097 | 2,097 | 2,097 | 2,097 |
| Person observations | 1,570 | 1,570 | 1,570 | 1,570 | 1,570 | 1,570 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| Survey year | Yes | Yes | Yes | Yes | Yes | Yes |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 1,570 employed refugees for a total of 2,097 refugee-year observations. The dependent variable is refugees' relative self-reported wages. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status, and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Column 3 controls for the interaction of unemployment rate at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 4 controls for the interaction of population density at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 5 controls for the interaction of refugees' share at district-level, measured in December 2012 interacted with survey years of 2017 and 2018. Column 6 includes controls of columns 3, 4, 5 all together. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7. Economic assimilation: Survey and administrative information (record linkage)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Refugees' relative employment | | | | Refugees' relative log wage | | | |
| Source: | Reclink | | Survey | | Reclink | | Survey | |
| MSA | 0.746*** | 0.755*** | 0.937*** | 0.943*** | 0.684* | 0.675* | 0.869** | 0.858** |
| | (0.057) | (0.057) | (0.059) | (0.058) | (0.380) | (0.381) | (0.355) | (0.355) |
| MSA × Threat | | 0.077* | | 0.053 | | -0.120 | | -0.158 |
| | | (0.042) | | (0.043) | | (0.328) | | (0.305) |
| R2 adjusted | 0.152 | 0.152 | 0.204 | 0.204 | 0.169 | 0.168 | 0.154 | 0.153 |
| Dep. var. mean | -0.531 | | -0.485 | | -0.753 | | -0.713 | |
| Person-Year observations | 7,618 | 7,618 | 7,618 | 7,618 | 1,028 | 1,028 | 1,028 | 1,028 |
| Person observations | 3,914 | 3,914 | 3,914 | 3,914 | 781 | 781 | 781 | 781 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 3,914 refugees for a total of 7,618 refugee-year observations that were matched to their administrative data through record linkage (see Section C.2.1). Columns 5 to 8 are restricted to employed refugees (sample: 1,028 refugees). The dependent variable is i) refugees' relative employment, from administrative records (columns 1 and 2) and self-reported (columns 3 and 4); and, ii) refugees' relative log wages, from administrative records (columns 5 and 6) and self-reported (columns 7 and 8). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8. Cultural convergence by question

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Risk preference | Negative reciprocity | Positive reciprocity | Trust | Locus of control | Egoistic-altr. society | Politics interest | Leisure, cultural activity |
| MSA | 0.083 | 0.080 | 0.077** | -0.061 | -0.074 | 0.001 | 0.128*** | 0.238*** |
| | (0.136) | (0.067) | (0.034) | (0.058) | (0.078) | (0.025) | (0.036) | (0.034) |
| MSA × Threat | 0.267* | 0.208** | 0.077*** | 0.047 | 0.047 | 0.000 | 0.014 | -0.058 |
| | (0.110) | (0.068) | (0.032) | (0.059) | (0.081) | (0.027) | (0.028) | (0.031) |
| | [0.092] | [0.021] | [0.092] | [0.913] | [0.921] | [0.996] | [0.921] | [0.254] |
| Person-Year observations | 11,837 | 6,263 | 6,390 | 3,259 | 2,666 | 2,909 | 12,227 | 7,913 |
| Person observations | 6,552 | 6,263 | 6,390 | 3,259 | 2,666 | 2,909 | 6,666 | 5,094 |
| R2 adjusted | 0.083 | 0.044 | 0.061 | 0.088 | 0.036 | 0.046 | 0.057 | 0.128 |
| Dep. var. mean | -4.004 | -2.328 | -1.396 | -0.770 | -1.027 | -0.595 | -1.294 | -0.944 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variables are the components of the cultural similarity index as detailed in Table C.3. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. P-values, shown in brackets, are adjusted for multiple hypotheses testing by controlling the family-wise error rate (FWER) using the Romano-Wolf procedure (Clarke et al., 2020; Romano & Wolf, 2016, 2005a,b). Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9. Cultural and economic assimilation: Disaggregation of threat

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | |
| MSA | 0.129*** | 0.121*** | 0.123*** | 0.130*** |
| | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × PC 1: Contemporary anti-immigrant sentiments | 0.082*** | | | 0.079** |
| | (0.031) | | | (0.031) |
| MSA × PC 2: Historical anti-immigrant sentiments | | 0.040 | | 0.040 |
| | | (0.027) | | (0.027) |
| MSA × PC 3: Contemporary openness | | | -0.049* | -0.046* |
| | | | (0.026) | (0.026) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.394 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | |
| MSA | 0.772*** | 0.770*** | 0.771*** | 0.772*** |
| | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × PC 1: Contemporary anti-immigrant sentiments | 0.016 | | | 0.017 |
| | (0.032) | | | (0.032) |
| MSA × PC 2: Historical anti-immigrant sentiments | | 0.031 | | 0.031 |
| | | (0.030) | | (0.030) |
| MSA × PC 3: Contemporary openness | | | 0.024 | 0.025 |
| | | | (0.028) | (0.028) |
| R2 adjusted | 0.180 | 0.180 | 0.180 | 0.180 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 |
| Individual controls | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | |
| District | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. PC 1, PC 2 and PC 3 are the principal components with eigenvalues greater than 1 (see Table A.10) which measure contemporary and historical anti-immigrant sentiments, and contemporary openness among locals respectively, and are z-standardized within each estimated model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Panel A always controls for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10. Principal component analyses: Factor loadings

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Eigenvalue | Difference | Proportion | Cumulative |
| PC 1 | 4.167 | 2.580 | 0.379 | 0.379 |
| PC 2 | 1.587 | 0.380 | 0.144 | 0.523 |
| PC 3 | 1.207 | 0.257 | 0.110 | 0.633 |
| PC 4 | 0.950 | 0.156 | 0.086 | 0.719 |
| PC 5 | 0.794 | 0.104 | 0.072 | 0.791 |
| PC 6 | 0.690 | 0.196 | 0.063 | 0.854 |
| PC 7 | 0.494 | 0.063 | 0.045 | 0.899 |
| PC 8 | 0.431 | 0.096 | 0.039 | 0.938 |
| PC 9 | 0.335 | 0.127 | 0.031 | 0.969 |
| PC 10 | 0.209 | 0.072 | 0.019 | 0.988 |
| PC 11 | 0.136 | 0.000 | 0.012 | 1.000 |
| | PC 1 | PC 2 | PC 3 | PC 4 |
| Vote for NPD in 2013 | 0.434 | -0.060 | 0.092 | 0.254 |
| Vote for NSDAP in 1933 | 0.102 | 0.550 | 0.324 | -0.338 |
| Mosque attacks | -0.180 | -0.031 | -0.654 | 0.251 |
| Big-5 Openness | -0.040 | -0.471 | 0.508 | -0.029 |
| Pogroms in the 1920s | 0.008 | 0.507 | 0.223 | 0.592 |
| Right-wing marches | 0.376 | -0.080 | 0.129 | 0.353 |
| Agreement to attacks against immigrants | 0.256 | -0.396 | 0.069 | 0.076 |
| Immigrant adaptation | 0.355 | 0.126 | -0.206 | 0.148 |
| Labor market competition | 0.389 | 0.061 | -0.022 | -0.099 |
| Prohibition of political activity | 0.332 | 0.143 | -0.180 | -0.485 |
| Intermarriage | 0.416 | -0.103 | -0.232 | -0.100 |

*Notes:* The top panel indicates for each principal component: i) its eigenvalue (column 1); ii) the difference to the next principal component (column 2); and, iii) the proportion and cumulative proportion of the sum of eigenvalues represented by this principal component (columns 3 and 4). The bottom panel indicates the weight of each threat variable in the first four principal components.

Table A.11. Threat index: Component-wise

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Threat component of interest: | Baseline: All included | Pogroms in the 1920s | Vote for NSDAP in 1933 | Vote for NPD in 2013 | Mosque attack (2001-2011) | Right-wing marches (2005-2012) | Big-5 open | Agree to attacks immig. | Immigrant adaptation | Labor market competition | Prohibit political activity | Inter-marriage |
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | | | | | | | | | |
| MSA | 0.129*** | 0.134*** | 0.122*** | 0.124*** | 0.122*** | 0.125*** | 0.122*** | 0.122*** | 0.125*** | 0.128*** | 0.128*** | 0.127*** |
| | (0.041) | (0.051) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat component | 0.082*** | -0.021 | 0.027 | 0.021 | -0.000 | 0.051* | -0.064** | 0.005 | 0.053* | 0.110*** | 0.079*** | 0.050* |
| | (0.031) | (0.051) | (0.027) | (0.031) | (0.026) | (0.031) | (0.027) | (0.028) | (0.028) | (0.030) | (0.028) | (0.029) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.394 | 0.393 | 0.393 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | | | | | | | | | |
| MSA | 0.772*** | 0.749*** | 0.771*** | 0.769*** | 0.772*** | 0.772*** | 0.771*** | 0.771*** | 0.769*** | 0.771*** | 0.772*** | 0.775*** |
| | (0.042) | (0.052) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat component | 0.016 | 0.038 | 0.036 | -0.017 | -0.050* | 0.014 | -0.028 | 0.003 | -0.025 | 0.003 | 0.018 | 0.039 |
| | (0.032) | (0.056) | (0.030) | (0.030) | (0.028) | (0.028) | (0.029) | (0.030) | (0.031) | (0.030) | (0.030) | (0.031) |
| R2 adjusted | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 12,334 refugees for a total of 6,691 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) for Panel A (resp. Panel B), calculated with the baseline specification of Threat with all components and referred throughout the paper (column 1). Then, specifications with single components of the threat index are used instead (columns 2 through 12). See Table C.1 for the exact source and definition of each component of the threat index. MSA refers to months since arrival. Both threat index (column 1) and its components (columns 2 through 12) are z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Regressions with cultural similarity as outcome (Panel A) always control for the composition of questions. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12. Absolute cultural change: Women's rights

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Women's rights | | | | | | | | | |
| | Working makes women more independent (1 not agree - 7 agree) | | Married women should work to be independent (1 not agree - 7 agree) | | If women earn more, this creates problems (1 agree - 7 disagree) | | Sons' education more important (1 agree - 7 disagree) | | Husband should have the last word (1 agree - 7 disagree) | |
| Method: | Metric | Dummy | Metric | Dummy | Metric | Dummy | Metric | Dummy | Metric | Dummy |
| MSA | 0.143 | 0.088 | 0.151 | 0.167 | 0.327** | 0.405*** | 0.439*** | 0.418*** | 0.490*** | 0.394*** |
| | (0.140) | (0.143) | (0.141) | (0.141) | (0.149) | (0.145) | (0.134) | (0.135) | (0.138) | (0.139) |
| MSA × Threat | -0.074 | -0.063 | 0.015 | -0.013 | 0.028 | -0.010 | 0.177 | 0.138 | 0.238* | 0.294** |
| | (0.125) | (0.129) | (0.125) | (0.131) | (0.143) | (0.137) | (0.139) | (0.139) | (0.130) | (0.131) |
| R2 adjusted | 0.053 | 0.034 | 0.068 | 0.052 | 0.055 | 0.054 | 0.096 | 0.088 | 0.080 | 0.075 |
| Person-Year observations | 6,304 | 6,304 | 6,303 | 6,303 | 6,145 | 6,145 | 6,321 | 6,321 | 6,381 | 6,381 |
| Person observations | 6,304 | 6,304 | 6,303 | 6,303 | 6,145 | 6,145 | 6,321 | 6,321 | 6,381 | 6,381 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the response of refugees' to survey questions that represent attitudes to women's rights, with both metric and dummy specifications which are: i) Having work makes women independent (columns 1 and 2); ii) Also married women should work to be independent (columns 3 and 4); iii) If women earn more, this creates problems (columns 5 and 6), iv) Sons' education is more important (columns 7 and 8); and, v) Husband should have the last word (columns 9 and 10). A detailed breakdown of the corresponding survey questions that are used to construct the variables and threshold values are presented in Table C.7. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model, along with dependent variables. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13. Absolute cultural change: Support for democracy and religion

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | System of government | | | | | | Religion | |
| | Democracy best system (1 disagree - 7 agree) | | Strong leader (1 agree - 7 disagree) | | Experts should decide (1 agree - 7 disagree) | | Importance of religion (1 low - 4 very important) | Freq. church and relig. events attendance (1 never - 5 daily) |
| Method: | Metric | Dummy | Metric | Dummy | Metric | Dummy | | |
| MSA | 0.137 | 0.009 | 0.175 | 0.188 | 0.362** | 0.221 | -0.247 | 0.392*** |
| | (0.176) | (0.174) | (0.156) | (0.158) | (0.163) | (0.164) | (0.153) | (0.137) |
| MSA × Threat | 0.061 | 0.112 | 0.429*** | 0.383*** | 0.393** | 0.377** | 0.039 | -0.211* |
| | (0.171) | (0.168) | (0.142) | (0.144) | (0.157) | (0.158) | (0.145) | (0.120) |
| R2 adjusted | 0.044 | 0.031 | 0.067 | 0.064 | 0.066 | 0.066 | 0.086 | 0.176 |
| Person-Year observations | 6,039 | 6,039 | 5,158 | 5,158 | 5,121 | 5,121 | 4,954 | 8,004 |
| Person observations | 6,039 | 6,039 | 5,158 | 5,158 | 5,121 | 5,121 | 4,954 | 5,127 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the survey response of refugees to the survey questions that represent their attitudes on: i) system of governance (columns 1 through 6) with both metric and dummy specifications; and, ii) religion (columns 7 and 8). For governance, variables are: i) democracy is the best system (columns 1 and 2); ii) importance of having a strong leader (columns 3 and 4); and, iii) experts should decide (columns 5 and 6). Religion-related survey questions are: i) importance of religion (column 7); and ii) frequency of church and religious events attendance (column 8). Detailed breakdown of the corresponding survey questions used to construct the variables and threshold values are presented at Table C.7. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model, along with dependent variables. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, highest education among 4 categories, and migration background: none, indirect, 5 years ago or less, 6-10 years, more than 10 years), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

# Appendix B: Robustness Checks

## B.1 Testing *Ex-ante* Selection

In Table B.1, we examine whether there is evidence of *ex-ante* selection of refugees with different characteristics across different types of regions. We begin with three regional characteristics: unemployment rate below or above the sample median (Panel A), continuous unemployment rate (Panel B), and urban-rural status (Panel C).[47] Next, in Table B.2, we consider: the threat index above or below the sample median (Panel A); and, the continuous threat index (Panel B). In columns 1 to 4, refugees' individual characteristics are: a dummy equal to one for female respondents; age; years of work experience before migration; and, a dummy for reporting Syria as the origin country. To test whether the assignment probability based on pre-entry characteristics changed over time, we interact the latter with arrival year, using 2015 as the reference year. Given that refugee flows were very low prior to 2015, we combine arrival years 2013 and 2014 to obtain enough observations per cell.[48] Reassuringly, there is no evidence that the allocation of refugees with different characteristics across different regions changed over time.

In columns 5 to 10, we investigate the possibility of *ex-ante* cultural selection on the side of refugees. We consider cultural similarity to locals in all of Germany in columns 5 to 7, and cultural similarity to locals living in the same NUTS-2 region in columns 8 to 10. Since we cannot observe the preferences of refugees before their arrival, this exercise can be conducted only for recently arrived refugees, under the assumption that they had less time to converge to local culture. We experiment with different definitions of "recent refugees", considering those arrived less than 8, 10, or 12 months prior to the interview, respectively.[49] Since the survey only started in 2016, we cannot observe recent arrivals for years 2013 and 2014. We thus restrict attention to changes in the cultural composition of recent arrivals between 2015 (omitted category) and 2016. Also in this case, we find no evidence that the cultural composition of refugees changed over time (and that this was correlated with the region of assignment).

[47] Unemployment rate is measured in December 2012 (at the NUTS-2 region level). Urban status is measured in 2018, but the classification is virtually constant over time, since status changes only in the case of a foreseeable permanent under- or over-run of the thresholds used. To increase precision, we use district, rather than region, to define a location as urban or rural. To classify districts into urban or rural we use the same criteria adopted in BBSR (2018): the population share in large and medium-sized cities, the population density of the district region, and the population density of the district region without taking into account the large and medium-sized cities.

[48] Results are unchanged if we consider the two years separately.

[49] The exact threshold used to define recent refugees does not change any of our results.

## B.2 Allowing for Differential Trends

In our preferred specification (Table 1, column 6), we include district fixed effects as well as interactions between survey year dummies and three important baseline district-level controls: unemployment, population density, and refugee share. This allows districts to be on differential trends, in a way that is correlated with local unemployment, population density, and the presence of refugees (before 2014) and both refugees' assimilation and local threat. Reassuringly, the coefficient on the interaction between threat and MSA is very stable and remains close to that of a more parsimonious specification that only includes survey and district fixed effects (Table 1, column 2). This is consistent with the idea that the allocation of refugees across districts did not change over time in a way that is correlated with local threat (and other district characteristics) and with refugees' potential for assimilation.

In Table B.3, we verify that results are robust to interacting year dummies with other, important (baseline) district-level controls. In particular, we consider: the share of the population aged 65 or older (column 2); the share of workers with an academic degree (column 3); the availability and the use of child care facilities (column 4); tax capacity (column 5); and, average monthly rents (column 6). These are all important variables that might be correlated with local threat and may influence both the assignment process and the assimilation of refugees. Reassuringly, in all cases, the coefficient on the interaction term in Panel A remains positive, statistically significant, and quantitatively close to that from the baseline specification (reported in column 1 to ease comparisons). Column 7 verifies that the point estimate is also unchanged when including all controls simultaneously.[50]

Finally, in Appendix D.2, we conduct a horse-race between threat and other local variables, such as the size of ethnic enclaves, proxies for local economic structure, and measures of cultural distinctiveness. Importantly, even when controlling for these other forces, the coefficient on the interaction between MSA and local threat remains positive and statistically significant (Table D.2).

## B.3 Ruling Out *Ex-post* Sorting

An important concern when interpreting our results is that, despite the initial allocation, refugees might have moved from regions where they had a low cultural match to those with a better fit – and that the degree of cultural fit were correlated with local threat. As explained in the main text, we implement an ITT strategy, using the region of assignment (rather than that of residence) to measure both threat and refugees' outcomes. This deals with the

[50] Panel B documents that results are unchanged also when focusing on economic assimilation: in this case, the point estimate is always close to zero and imprecisely estimated (as in column 1).

potential concern of refugees' *ex-post* sorting. It is also important to remember that, in our sample, more than 75% of refugees did not move, due to informal barriers to mobility, which became formal with the 2016 Integration Act. This further reduces concerns about refugees' migration.

However, to more directly inspect the potential for *ex-post* sorting, in Figure B.1, we examine the cultural and economic assimilation of refugees that moved from the region of assignment. We estimate different individual (refugee) level regressions that have as outcomes: the CSI (first dot from the top), each of its eight components, and relative employment (last dot). In the top panel, we consider cultural and economic assimilation relative to national averages (exactly as in the main text); in the bottom panel, we allow sorting of refugees to be "region-specific", and thus compute the same variables relative to the averages of locals in the NUTS-2 region of assignment.

We plot the coefficient on a dummy equal to one if the refugee moved from the region of assignment, partialling out the same set of fixed effects and individual and district-level controls as in our preferred specification (see Table 1, column 6). There is no evidence that movers systematically differ from refugees that stayed in the region of assignment. This is reassuring for our empirical analysis, and indicates that our results are unlikely to be driven by the selective relocation of refugees across regions.

As an additional exercise, in Table B.4, we re-estimate our baseline specification (Table 1, column 6) for different sub-samples of refugees. We focus specifically on the CSI, computed relative to all locals (odd-numbered columns) and to locals living in the same NUTS-2 region (even-numbered columns). To ease comparisons, we also report the coefficient of our preferred specification (for the full sample) in column 1. In column 2, we verify that results (again, for the full sample of refugees) are similar when we measure cultural assimilation towards locals in the region of assignment, rather than to all Germans.[51]

Next, in columns 3 and 4, we focus on refugees that still live in the region of assignment at the time of the interview. Reassuringly, we find marginally larger but statistically indistinguishable estimates for this sub-sample. In columns 5 and 6, we instead restrict attention to refugees that were covered by the 2016 Integration Act, which prohibited the free mobility of refugees. All refugees whose asylum decision was made after August of 2016 were not allowed to leave the Federal States to which they were assigned. In the majority of states, this law was even more restrictive, prohibiting refugees to move out of their district of assignment as long as they were not able to make their own living (see also Section 2 for

[51]That nation-wide and regional CSI are very similar is not surprising, since the cultural gap between refugees and any German individual is much larger than the difference between any two German respondents. Thus, measuring the distance of refugees relative to all Germans or Germans living in a specific region does not make any meaningful difference.

more details).[52] Reassuringly, coefficients on MSA and on the interaction term remain close to those reported in columns 1 and 2.

Finally, in column 1 of Table B.5, we re-estimate our baseline equation, and define the dependent variable as a dummy for moving from one German region to another. The coefficient on MSA is positive and statistically significant. This is to be expected: as refugees spend more time in Germany, they become better able to relocate. However, and importantly, the coefficient on the interaction between MSA and the threat index is small and statistically insignificant. This indicates that there is no evidence of internal migration of refugees over time between more or less threatening areas. Note that, even if such relocation process were to take place, our ITT approach would take care of it. However, we find it even more reassuring for our design that no differential migration patterns are detected between regions with different levels of threat.

While the ITT design addresses the potential relocation of refugees, it does not deal with the possibility that locals moved away from a region, following the inflow of refugees (a process often referred to as "white flight"; see Boustan, 2010, among others). If white flight were correlated with the characteristics of local movers, this may change the composition of locals interacting with refugees. Even though we fix locals' preferences at baseline and measure cultural similarity to all locals, irrespective of their location within Germany, selective white flight may nonetheless influence the process of (economic and cultural) assimilation of refugees.

In columns 2 to 5 of Table B.5, we address the concern that our findings may be driven by (selective) white flight. We restrict attention to locals, and define the dependent variable as a dummy equal to one for moving between a given survey and the next survey in which the respondent participated (between 2013 and 2018).[53] We estimate regressions that control for gender, age, age squared, highest education (4 categories), and migration background (no, indirect, 5 years ago or less, 6-10 years, more than 10 years). All regressions also include interactions between year dummies and district baseline characteristics: unemployment rate, population density, and refugee share. The main regressors are the refugee share in the district of residence of the respondent at the end of the year before the interview and its interaction with the threat index of the corresponding region.

Reassuringly, the point estimates on both regressors in column 2 are small and not statistically significant. Next, in columns 3 to 5, we augment the previous specification by also including the triple interaction between the refugee share, the threat index and respondents'

[52]Most refugees were assigned to states that made use of the restrictive version of the act. These include North Rhine-Westphalia, Baden-Württemberg, Bavaria and Saarland. For our purposes, any state that is simultaneously a NUTS-2 region, also meets the requirement of a "restrictive mobility" policy. This includes the city states Berlin, Bremen and Hamburg, as well as Brandenburg, Thuringia, Mecklenburg Western-Pomerania, Saxony-Anhalt, as well as Schleswig-Holstein.

[53]The SOEP has information on the respondents' place of residence at the time of the interview.

attitudes towards refugees.[54] Importantly, the coefficient on the triple interaction is always close to zero and never statistically significant.[55]

## B.4 Ruling Out Selective Attrition

In Table B.6, we address the possibility that changes in the sample composition may be driving our results through selective attrition. In particular, one may be concerned that less assimilated refugees drop out of the survey over time, leaving us with a more culturally similar (and economically integrated) pool. This would be problematic for our design if selective attrition were more (or less) likely to occur in regions with higher levels of threat.

To address this concern, we exploit the fact that some refugees were interviewed multiple times, and define the dependent variable as the probability of disappearing from the subsequent survey wave. That is, we create a dummy variable equal to one if a refugee present in one wave did not appear in the following one. In column 1, we regress this indicator against MSA, separately controlling for individual characteristics and interactions between survey year fixed effects and baseline district characteristics. As expected, the probability of attrition increases with time spent in Germany.

In column 2, we include the cultural similarity index and its interaction with MSA, to verify that refugees that are culturally more similar are not more likely to drop out of the survey at different points in time. Reassuringly, the coefficient on the interaction term is close to zero and not statistically significant, suggesting that there is no selective attrition (by cultural similarity) of refugees over time. In column 3, we examine whether refugees assigned to regions with a higher threat index are more likely to drop out of the sample over time. Reassuringly, also in this case, the interaction term between MSA and threat is small and not statistically significant.[56]

In column 4, we simultaneously include the cultural similarity and the threat index, as well as their interactions with MSA. Once again, there is no evidence of selective attrition along either dimension. Finally, in column 5, we estimate a specification that also includes the triple interaction between MSA, threat, and cultural similarity. The point estimate is very close to zero and not statistically significant. This weighs against the possibility that less assimilated refugees drop out at differential rates in regions characterized by different levels of threat.

[54] All regressions are fully saturated, but we do not report coefficients on lower order terms to save space.

[55] Specifically, we measure attitudes towards refugees as the assessment of their impact on: the economy (column 2), cultural life (column 3), and, the overall quality of life (column 4). Higher values indicate a more positive perception of refugees.

[56] Note that the threat index is absorbed by district fixed effects.

## B.5 Alternative Measures of Cultural Similarity

As an additional robustness exercise, we replicate our main estimation table (Table 1 in the main text), using different statistical measures for our cultural assimilation outcome. In Panel A of Table B.7, we replace the Euclidean cultural similarity index with the Canberra index – another entropy measure of the Minkowski family, which standardizes each sub-component of the index by the maximum distance observed in the data. This measure captures whether cultural convergence comes from the combination of questions rather than a specific subset of questions.[57] Reassuringly, the coefficient on the interaction term remains positive and statistically significant.

In Panel B, we simplify our measure of cultural similarity. We measure the absolute difference between the average response of locals and the refugee. In contrast to the Euclidean and Canberra index, this measure does not account for heterogeneity of preferences within the local population, but measures similarity to a simpler "average culture". Also in this case, the coefficient on the interaction term remains positive and statistically significant. Moreover, the magnitude of the coefficient is remarkably similar to the Euclidean distance.[58]

In addition, we document that results are not driven by the exact set of questions considered to define cultural preferences. As described in Section 3, the baseline CSI includes questions that are available for both refugees and locals and adhere to a strict definition of culture in the form of stated beliefs and preferences. By relaxing the definition of "culture", we can use the full set of overlapping variables (Table C.4), and expand the cultural similarity index to 12 dimensions, including feelings of social inclusion, self-attitudes, and worries. Results are reported in Table B.8 (Panel A), where we document that coefficients become slightly smaller in size, but more precisely estimated.

Next, we verify that results are robust to restricting attention to native-born respondents when defining the baseline local culture. Since 15% of respondents in the SOEP are not born in Germany (Table A.2), one may be worried that cultural convergence may be over-stated, if immigrants and refugees have more similar preferences than refugees and the average native-born local. Reassuringly, results are unchanged when the CSI is constructed restricting the sample of locals to those born in Germany (Table B.8, Panel B).

Finally, we address the concern that results might be driven by a single component of the CSI. In Figure B.2, we omit one component of the CSI at the time. Reassuringly, results are always very close to those from our baseline specification, reported in the first dot from

[57] Formally, the Canberra index can be written as $D_{Ca} = \sum_{i=1}^{d} \frac{|P_i - Q_i|}{P_i + Q_i}$, with $P_i$ and $Q_i$ representing two probability density functions. Relative to the Euclidean distance, the Canberra distance lowers the weight of potential outliers. In other words, if refugees converge to locals only along one cultural dimension, this would be captured in the Euclidean index, but would be discounted in the Canberra index.

[58] Note that the magnitude of coefficients in Panel A cannot be directly compared to that of coefficients in the baseline specification (or those in Panel B).

the left to ease comparisons.

## B.6 Addressing the Potential Endogeneity of Local Culture

It is possible that refugee inflows led to broader changes in locals' ideology. Since in our main analysis we fixed local culture at baseline, one may be worried that our results over-state convergence if refugee inflows triggered changes in local preferences, more so in regions with higher levels of threat. We tackle this concern in different ways.

First, we replicate the analysis conducted in Panel A of Table 1 by constructing the CSI using locals' preferences measured at endline, rather than baseline. Specifically, we use the latest available survey year for locals for each of the questions included in the index. Results are reported in Panel B of Table B.10, which also presents those from the preferred specification to ease comparisons in Panel A. Reassuringly, coefficients on both MSA and the interaction between MSA and threat are close to – if anything larger than – those obtained when measuring CSI at baseline. This indicates that fixing locals' preferences before the inflow of refugees does not lead us to over-state refugees' cultural convergence.

Second, we directly inspect the relationship between locals' preferences and refugee inflows for each of the eight cultural traits used to construct the CSI. This analysis mirrors that conducted for refugees, with two differences. First, the sample of respondents is now composed of locals. Second, instead of MSA, the main regressor is the refugee share in the district of residence of the respondent at the end of the year before the survey was conducted. All regressions control for district and survey year fixed effects, for individual characteristics, and for interaction between district baseline variables and year dummies. We adjust confidence intervals for multiple hypotheses testing.

Panel A of Table B.12 reports results obtained when only including the refugee share in the district. Coefficients are never statistically significant. Moreover, no clear pattern emerges. Panel B augments this specification by also interacting the refugee share with the threat index prevailing in the region. Again, once confidence intervals are adjusted for multiple hypothesis testing, none of the coefficients on either the refugee share or its interaction with threat is statistically significant at conventional levels. Also in this case, there is no systematic trend.

Taken together, results in Tables B.10 and B.12 suggest that refugees' inflows did not significantly alter locals' preferences, and that our results are unlikely to be over- or understated due to endogenous changes in local culture.

## B.7 Robustness to Measurement of Threat

In this section, we conduct two exercises to probe the robustness of results to the definition of threat. First, we replicate the baseline specification omitting each component of the threat index, and computing the principle component using the remaining 10 dimensions. Results are reported in Figure B.3. In all cases, the interaction term remains positive, statistically significant, and close to that from the baseline specification (reported in the first dot from the left).[59]

Second, we address the concern that our results may be biased by the fact that refugee inflows changed local threat differentially across regions. In the preferred specification, we fix threat at baseline (i.e., prior to 2013) to rule out the possibility that our key regressor of interest were endogenous, i.e., influenced by the inflow of refugees. Yet, one may be worried that this choice leads to under- or over-estimation of the impact of local hostility on assimilation.[60] Hence, we construct the threat index replacing its baseline components with endline ones.

In Table B.11, we replicate our baseline results, presenting the relationship between cultural (Panel A) and economic (Panel B) assimilation and each component of threat measured at endline in columns 1 to 9.[61] Consistent with the decomposition of the baseline threat index (Table A.11), the vote share of the Alternative for Germany (AfD) or the NPD do not seem to influence refugees' cultural assimilation over time (columns 1 and 2). Instead, again similar to the pattern observed in Table A.11 for the baseline counterparts, lower locals' openness (column 3) and higher participation in far-right demonstrations (column 4) are associated with stronger cultural convergence among refugees over time. Likewise, all crime categories have a statistically significant and quantitatively meaningful impact on refugees' cultural convergence (columns 5 to 9).[62] In column 10, we report results for the first principal component of the variables considered in columns 1 to 9, and document that they are in line with those from the baseline specification (Table 1, column 6).[63]

[59] See Table C.1 for a detailed description of each component included in the threat index.

[60] If threat increased (more) in high threat regions, this would lead to downward bias in our estimates. However, one may be worried that regions with relatively low values of threat before 2013 "caught up", experiencing a stronger increase in locals' hostility. If this were to be the case, our results might be upward biased.

[61] See Appendix C.2.4 for a detailed description of contemporaneous threat. The correlation between our main baseline threat index and the first principal component of contemporaneous threat is 0.82.

[62] These results mirror those reported in columns 8 to 12 of Table A.11 for the baseline index.

[63] In Panel B of Table B.11, we verify that, as for the baseline specification, none of the components of the threat index (nor the first principal component) influences refugees' economic convergence.

## B.8 Adjusting Standard Errors for Spatial Correlation

As explained in the main text, following Abadie et al. (2017), we cluster standard errors at the person level. In Table B.13, we verify that our estimates remain statistically significant when adjusting standard errors for potential spatial correlation in the error term. First, in column 2, we cluster standard errors at the district level. The coefficient on the main effect of MSA remains statistically significant at the 1% level both for cultural (Panel A) and for economic (Panel B) assimilation. Turning to the interaction term, the coefficient in Panel A becomes statistically significant at the 10%.

Next, in columns 3 to 6, we adjust standard errors using the Conley (1999) procedure, which we implement using the code by Colella et al. (2019), applying different geographic lags. In columns 3 and 4, we use as distance parameter: the median distance between centroids of adjacent districts in Germany (33.15 km); and, twice this distance (66.3 km).[64] In column 5, we allow for correlation across adjacent districts. In column 6, we extend this to neighbors of neighbors. Reassuringly, while standard errors become somewhat larger than in the baseline specification (column 1), the point estimate on the interaction between threat and MSA in Panel A is always statistically significant at least at the 10% level.

## B.9 Additional Robustness Checks

Finally, we conduct additional robustness checks in Table B.14. To ease comparisons, in column 1, we report results from our baseline specification for cultural and economic assimilation in Panels A and B, respectively. In column 2, we interact year dummies with a dummy for regions belonging to East Germany.[65] Since substantial cultural and political differences between former Eastern and Western Germany – including support for right-wing parties, attitudes towards immigration, and preferences for redistribution (Lange, 2021) – still persist until today, it is important to verify that such differences do not drive our results. The interaction between the East Germany and the year dummies makes sure that differential responses to the refugee influx of 2015 are accounted for.

In columns 3 and 4, we consider the possibility that refugees from different regions of origin were differentially assigned across German areas and had a differential propensity to assimilate to local culture. To do so, we interact year dummies with, respectively, origin country dummies and the distance (in km) from the closest border of the refugees' origin countries to the centroid of the NUTS-2-region of assignment.[66] In column 5, we check

[64] This guarantees that neighboring districts are considered correlated, but also handles cases where districts are separated by a small district.

[65] East Germany includes former GDR states Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt, Thuringia, and Berlin. The data does not allow to distinguish East and West Berlin.

[66] We consider distance from country of origin and German NUTS-2-region because this variable may influence the probability

that results are robust to including dummies for year of arrival (in addition to all other controls). Next, in columns 6 and 7, we replicate the analysis by trimming the sample and by dropping individuals with cultural similarity and relative employment at the top (resp. bottom) 1st (resp. 99th) percentile, respectively. In Figure B.4, we more systematically show that no single region is driving our results. Specifically, we replicate the analysis for cultural assimilation by dropping each NUTS-2 region at the time. Reassuringly, results are always in line with those from the full sample (reported in the first dot from the left).

In column 8, we address recent concerns on DD settings with staggered treatment adoption. In particular, it is possible that, in two-way fixed effects estimate of DD, already treated units are used as controls, and this might introduce bias in the presence of heterogeneous effects across groups experiencing treatment at different points in time (De Chaisemartin & d'Haultfoeuille, 2020; Goodman-Bacon, 2021).[67] To address this issue, we restrict the sample to individuals who were surveyed only once. Reassuringly, results remain unchanged.

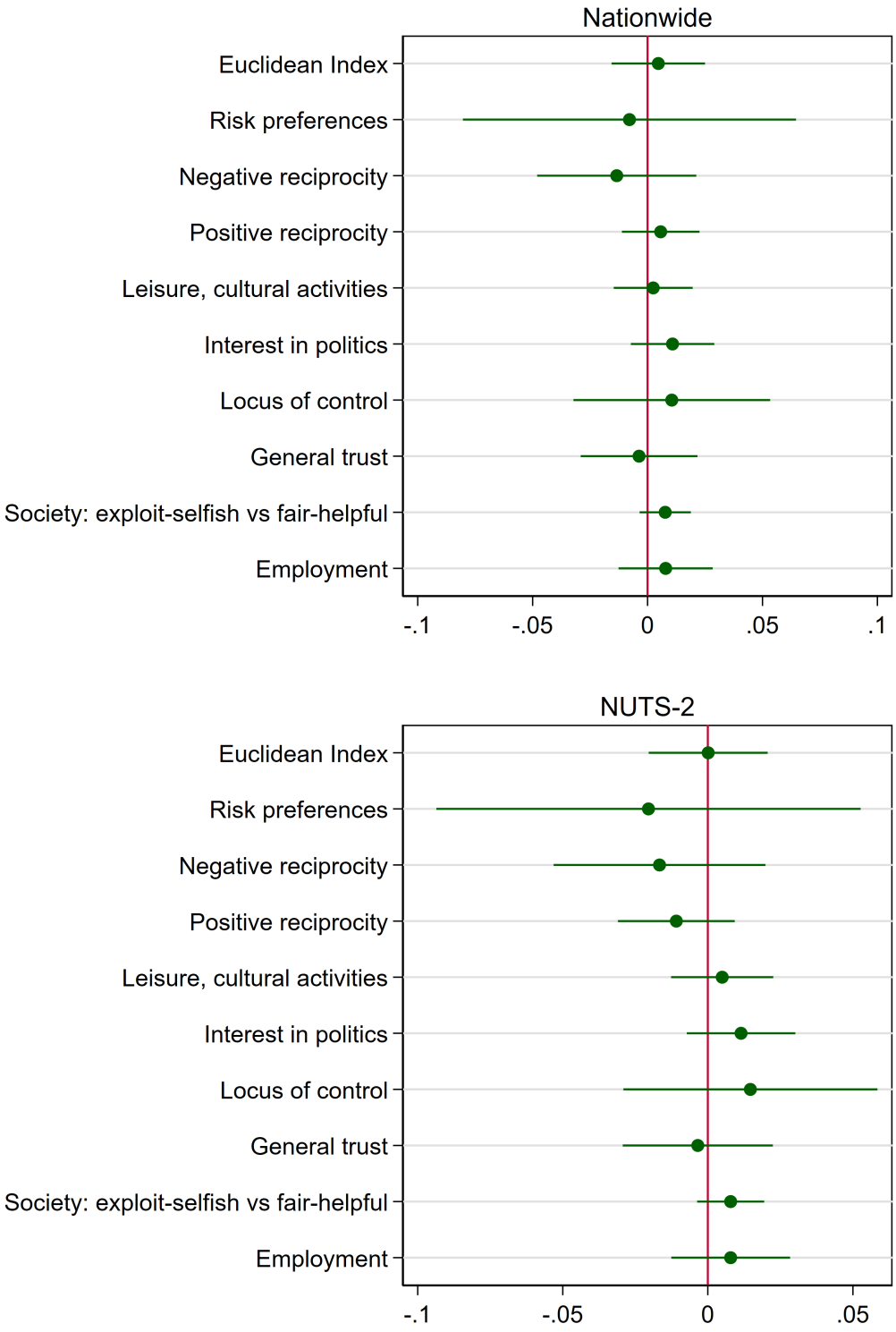
Finally, in column 9, we present 2SLS estimates, using region of assignment as an instrument for the region of residence. Results are again unchanged.[68]

of assignment of a refugee to a given local area.

[67] More generally, two-way fixed effects estimates can be viewed as a weighed sum of the average treatment effects (ATE) in each group and period, with weights that may be negative.

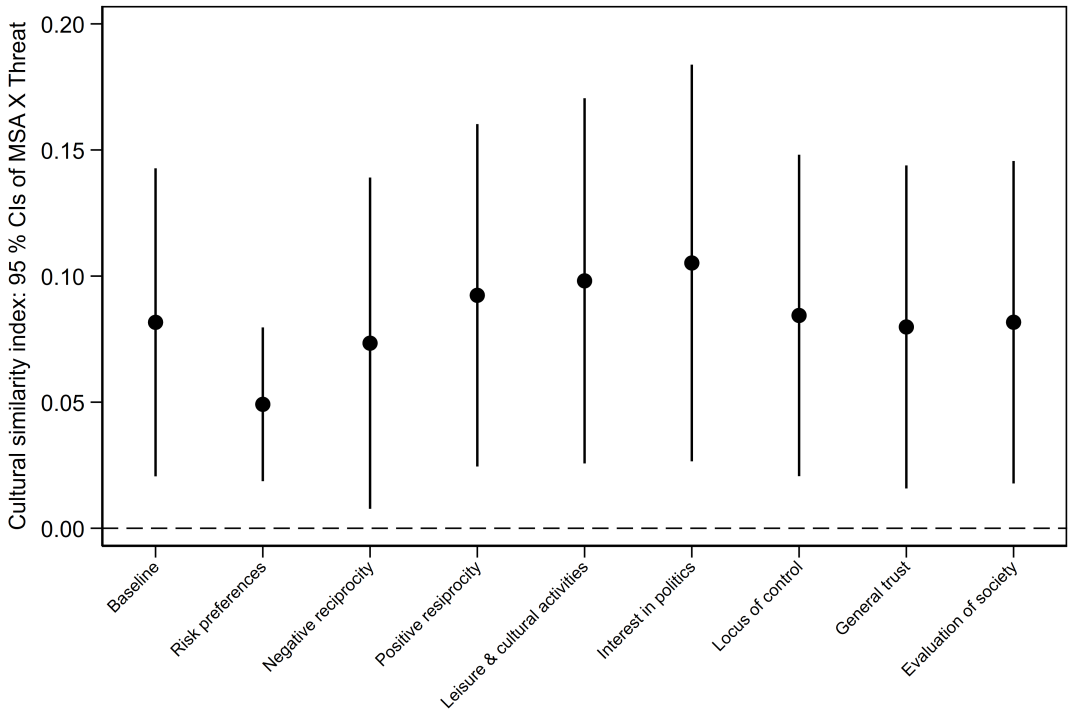
[68] At the bottom of the table, we report the Cragg-Donald Wald and the Kleibergen-Paap Wald F-statistics. Both are well above conventional levels, indicating that the first stage is strong.

Figure B.1. Convergence of movers (by question)



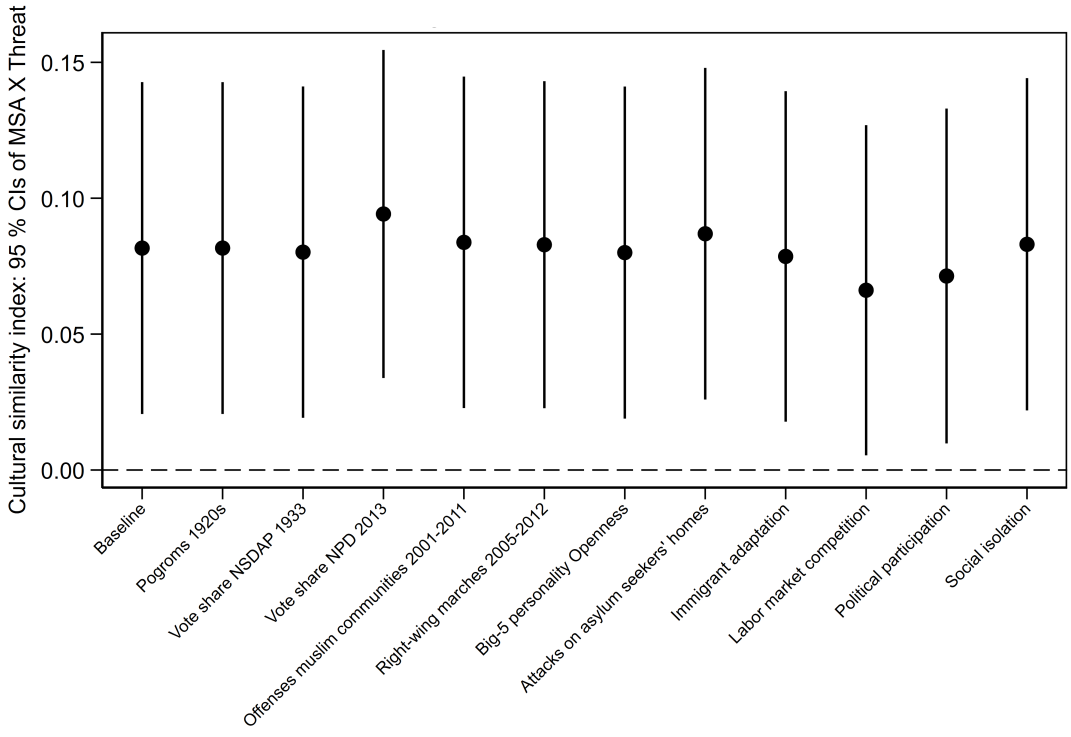

*Notes:* The graph plots the coefficient (with corresponding 95% confidence intervals) of a dummy variable for *movers* (refugees living out of the region of assignment at the time of the interview) in a regression with dependent variable: i) the cultural similarity index (first line); ii) the different dimensions of the similarity index; and, iii) employment relative to locals (last line). The underlying regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. The regression for the first line includes controls for dummies for the composition of questions included in the cultural similarity index. Standard errors are clustered at the person-level.

Figure B.2. Dropping single components from CSI



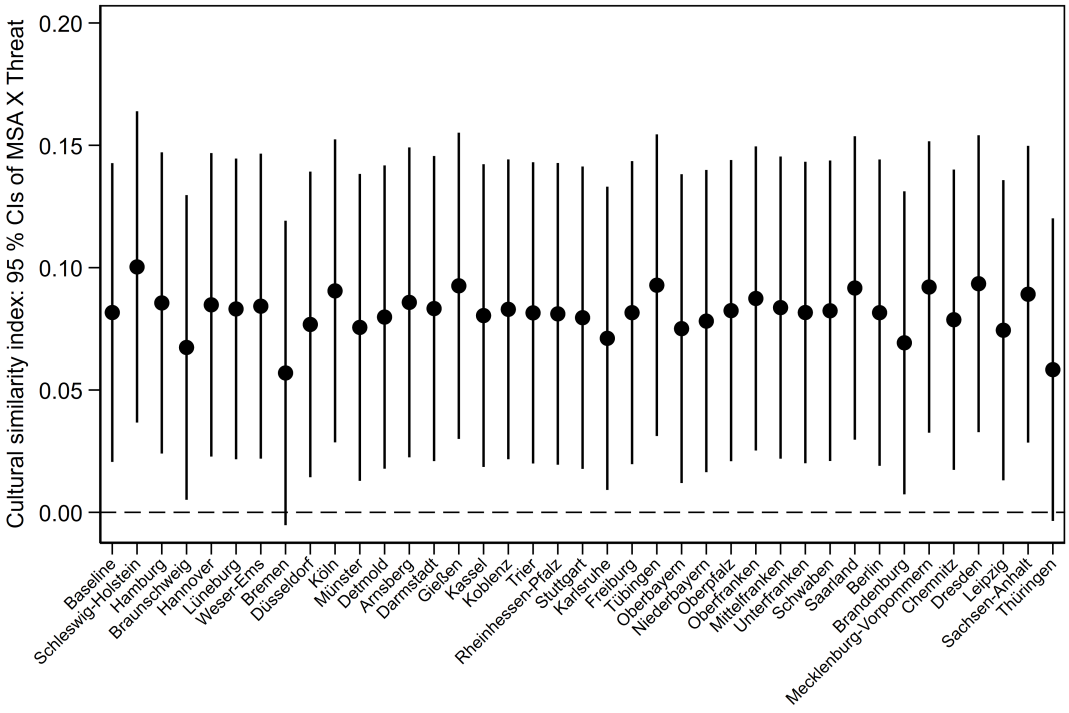

*Notes:* The figure plots the 95% confidence interval of MSA × Threat, using cultural similarity index as the outcome while omitting single components used to construct the cultural similarity index.

Figure B.3. Dropping single components from threat index




*Notes:* The figure plots the 95% confidence interval of MSA × Threat, using cultural similarity index as the outcome while omitting single components used to construct the threat index.

Figure B.4. Dropping single regions




*Notes:* The figure plots the 95% confidence interval of MSA × Threat, using cultural similarity index as the outcome while omitting single regions of Germany.

Table B.1. Probability of assignment to region type by pre-entry characteristic

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CSI | | | Regional CSI (NUTS-2) | | |
| Characteristic: | Gender | Age | Work exp. | Origin Syria | 8 months | 10 months | 12 months | 8 months | 10 months | 12 months |
| | *Panel A. Above (=1) vs. below (=0) unemployment (NUTS-2, Dec-2012)* | | | | | | | | | |
| Variable | -3.732** | 0.078 | -0.218** | 3.781* | -1.271 | -0.972 | 2.112 | -2.939 | -0.951 | 2.578 |
| | (1.590) | (0.099) | (0.110) | (2.036) | (6.446) | (2.705) | (1.756) | (6.050) | (2.713) | (1.754) |
| Arrival year: 2013, 2014 × variable | -0.436 | 0.070 | 0.106 | -3.795 | | | | | | |
| | (2.434) | (0.140) | (0.154) | (3.504) | | | | | | |
| 2016 × variable | 3.019 | 0.096 | 0.130 | -1.675 | 4.716 | -0.724 | -3.190 | 6.514 | -0.392 | -3.370 |
| | (3.084) | (0.164) | (0.187) | (4.277) | (7.394) | (4.575) | (3.430) | (7.167) | (4.693) | (3.506) |
| R2 adjusted | 0.069 | 0.069 | 0.071 | 0.064 | 0.129 | 0.133 | 0.123 | 0.130 | 0.133 | 0.123 |
| Dep. var. mean | 0.485 | 0.485 | 0.484 | 0.485 | 0.500 | 0.484 | 0.475 | 0.500 | 0.484 | 0.475 |
| | *Panel B. Unemployment rate in percent (NUTS-2, Dec-2012)* | | | | | | | | | |
| Variable | -11.784 | 0.703 | -0.423 | 6.001 | -52.026 | -21.524 | -5.455 | -63.815* | -22.956 | -6.580 |
| | (7.989) | (0.490) | (0.560) | (10.042) | (35.998) | (14.469) | (9.620) | (33.830) | (14.597) | (9.491) |
| Arrival year: 2013, 2014 × variable | -4.787 | -0.446 | -0.064 | -5.484 | | | | | | |
| | (12.178) | (0.714) | (0.825) | (18.084) | | | | | | |
| 2016 × variable | 16.996 | 0.857 | 0.681 | 12.144 | 38.245 | -5.028 | -7.614 | 47.584 | -2.048 | -6.708 |
| | (15.437) | (0.809) | (0.937) | (21.364) | (41.290) | (22.767) | (17.928) | (39.635) | (22.977) | (18.051) |
| R2 adjusted | 0.109 | 0.109 | 0.107 | 0.103 | 0.215 | 0.217 | 0.176 | 0.220 | 0.217 | 0.176 |
| Dep. var. mean | 7.395 | 7.395 | 7.366 | 7.395 | 8.087 | 7.734 | 7.728 | 8.087 | 7.734 | 7.728 |

Table B.1. Continued

| | *Panel C. Urban (=1) vs. rural (=0) district* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | 2.274* | 0.081 | -0.015 | 0.348 | 1.014 | -0.316 | -1.826 | 2.776 | 0.053 | -1.459 |
| | (1.323) | (0.079) | (0.090) | (1.626) | (4.499) | (2.327) | (1.529) | (4.984) | (2.393) | (1.542) |
| Arrival year: 2013, 2014 × variable | -1.437 | -0.021 | -0.074 | -1.803 | | | | | | |
| | (2.008) | (0.114) | (0.125) | (2.841) | | | | | | |
| 2016 × variable | -1.681 | -0.166 | 0.031 | -1.779 | 2.450 | 1.220 | 1.440 | 0.976 | 0.740 | 1.084 |
| | (2.625) | (0.136) | (0.161) | (3.472) | (5.535) | (3.716) | (2.730) | (6.025) | (3.811) | (2.755) |
| R2 adjusted | 0.270 | 0.270 | 0.267 | 0.267 | 0.213 | 0.280 | 0.295 | 0.214 | 0.280 | 0.294 |
| Dep. var. mean | 0.692 | 0.692 | 0.691 | 0.692 | 0.693 | 0.674 | 0.659 | 0.693 | 0.674 | 0.659 |
| Person observations | 6,522 | 6,522 | 6,111 | 6,522 | 202 | 607 | 1,292 | 202 | 607 | 1,292 |
| Household observations | 4,367 | 4,367 | 4,133 | 4,367 | 174 | 500 | 1,021 | 174 | 500 | 1,021 |
| N 2015 | | | | | 61 | 371 | 943 | 61 | 371 | 943 |
| All idv. and reg. controls, except outcome and mediator | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Composition | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of the earliest observation of 6,522 refugees arriving between 2013 and 2016. Columns 5 to 7 (resp. 8 to 10) restrict the sample to refugees that arrived less than 8, 10, and 12 months before the interview, using cultural similarity index (resp. at region-level). The dependent variable is a characteristic of the location of assignment of the refugee, measured in December 2012: i) whether the NUTS-2 region is above or below the median unemployment (Panel A); and, ii) the unemployment rate of the NUTS-2 region (Panel B); and, iii) whether the district is urban (Panel C, based on BBSR 2018). Median values are measured within each sample. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival, except the characteristic of interest in columns 1 to 4), and the interaction of arrival year categories and district controls (unemployment rate except for Panel A and B, share of refugees, and population density except for Panel C), all measured in December 2012. Columns from 5 to 10 always control for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the household-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.2. Probability of assignment to region type by pre-entry characteristic: Threat

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | National CSI | | | NUTS-2 CSI | | |
| Characteristic: | Gender | Age | Work exp. | Origin Syria | 8 months | 10 months | 12 months | 8 months | 10 months | 12 months |
| | *Panel A. Threat index above (=1) vs. below (=0) median (NUTS-2)* | | | | | | | | | |
| Variable | -0.439 | 0.086 | -0.083 | 4.060** | -18.917** | -8.574*** | -3.405** | -15.113** | -6.182*** | -1.912 |
| | (1.456) | (0.091) | (0.100) | (1.886) | (7.873) | (2.332) | (1.593) | (7.541) | (2.372) | (1.602) |
| Arrival year: 2013, 2014 × variable | -2.918 | -0.140 | -0.129 | -2.164 | | | | | | |
| | (2.303) | (0.130) | (0.141) | (3.291) | | | | | | |
| 2016 × variable | -0.540 | 0.018 | -0.045 | 3.926 | 14.706 | 0.964 | -1.936 | 13.952 | 2.747 | -0.679 |
| | (2.879) | (0.160) | (0.183) | (4.027) | (9.140) | (3.899) | (2.867) | (8.814) | (4.049) | (2.937) |
| R2 adjusted | 0.197 | 0.197 | 0.194 | 0.195 | 0.309 | 0.314 | 0.306 | 0.293 | 0.303 | 0.303 |
| Dep. var. mean | 0.507 | 0.507 | 0.509 | 0.507 | 0.485 | 0.491 | 0.483 | 0.485 | 0.491 | 0.483 |
| | *Panel B. Continuous threat measure (NUTS-2)* | | | | | | | | | |
| Variable | 1.499 | -0.111 | 0.120 | 3.002 | -31.531** | -9.490** | 0.135 | -26.114** | -6.193* | 1.892 |
| | (2.482) | (0.146) | (0.167) | (3.143) | (12.742) | (3.895) | (2.557) | (12.569) | (3.690) | (2.492) |
| Arrival year: 2013, 2014 × variable | -7.604** | 0.002 | 0.084 | -0.027 | | | | | | |
| | (3.739) | (0.218) | (0.241) | (5.346) | | | | | | |
| 2016 × variable | 0.720 | 0.010 | -0.127 | 8.431 | 19.521 | 2.111 | -4.356 | 19.818 | 4.767 | -1.920 |
| | (4.589) | (0.237) | (0.275) | (6.267) | (14.788) | (6.388) | (4.727) | (14.755) | (6.352) | (4.716) |
| R2 adjusted | 0.450 | 0.450 | 0.453 | 0.443 | 0.435 | 0.512 | 0.539 | 0.423 | 0.508 | 0.539 |
| Dep. var. mean | 0.000 | 0.000 | -0.004 | 0.000 | 0.000 | 0.000 | -0.000 | 0.000 | 0.000 | -0.000 |
| Person observations | 6,522 | 6,522 | 6,111 | 6,522 | 202 | 607 | 1,292 | 202 | 607 | 1,292 |
| Household observations | 4,367 | 4,367 | 4,133 | 4,367 | 174 | 500 | 1,021 | 174 | 500 | 1,021 |
| N 2015 | | | | | 61 | 371 | 943 | 61 | 371 | 943 |
| All idv. and reg. controls, except outcome and mediator | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Composition | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of the earliest observation of 6,522 refugees arriving between 2013 and 2016. Columns 5 to 7 (resp. 8 to 10) restrict the sample to refugees that arrived less than 8, 10, and 12 months before the interview, using the cultural similarity index (resp. at region-level). The dependent variable is a characteristic of the location of assignment of the refugee, measured in December 2012: i) whether the NUTS-2 region has above median threat index (Panel A); and, ii) the threat index of the NUTS-2 (Panel B). Threat is the threat index described in the text, and is z-standardized within each sample. Median values are measured within each sample. Coefficients and standard errors are multiplied by 100 for presentation All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival, except the characteristic of interest in columns 1 to 4), and the interaction of arrival year categories and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Columns 5 to 7 additionally control for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the household-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3. Assimilation, local threat and additional district controls

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | | | | |
| MSA | 0.129*** | 0.130*** | 0.130*** | 0.132*** | 0.128*** | 0.130*** | 0.131*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat | 0.082*** | 0.086*** | 0.079** | 0.086*** | 0.074** | 0.082*** | 0.071** |
| | (0.031) | (0.032) | (0.032) | (0.032) | (0.031) | (0.031) | (0.033) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.394 | 0.393 | 0.393 | 0.394 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | | | | |
| MSA | 0.772*** | 0.773*** | 0.772*** | 0.773*** | 0.773*** | 0.773*** | 0.774*** |
| | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat | 0.016 | 0.018 | 0.010 | 0.021 | 0.018 | 0.015 | 0.019 |
| | (0.032) | (0.033) | (0.033) | (0.032) | (0.032) | (0.032) | (0.034) |
| R2 adjusted | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.179 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | Population 65 or older | Employees w/ degree | Places in facilities | Tax capacity | Mean net cold rents | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | |
| Survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Survey year × main district controls | Yes | Yes | Yes | Yes | Yes | Yes | No |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), and district fixed effects, all measured in December 2012. District controls refer to the survey years of 2017 and 2018 interacted with district-level unemployment rate, population density, and share of refugees as in Table 1. Columns 2-7 include survey years of 2017 and 2018 interacted with population share 65 and older (in percent), employees with academic degree (percent), places in child care facilities (per pedagogically active person), tax capacities of municipalities (EUR per inhabitant), and mean net cold rents (EUR per square meters) in this order, individually. Column 8 includes controls of columns 2 through 7 all together. Panel A always controls for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.4. Cultural assimilation and mobility

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | All | | Stayers | | Mobility restriction | |
| | National CSI | NUTS-2 CSI | National CSI | NUTS-2 CSI | National CSI | NUTS-2 CSI |
| MSA | 0.129*** | 0.125*** | 0.111** | 0.109** | 0.125** | 0.118* |
| | (0.041) | (0.042) | (0.046) | (0.047) | (0.060) | (0.061) |
| MSA × Threat | 0.082*** | 0.075** | 0.113*** | 0.101*** | 0.102** | 0.100** |
| | (0.031) | (0.032) | (0.035) | (0.036) | (0.043) | (0.044) |
| R2 adjusted | 0.393 | 0.392 | 0.399 | 0.399 | 0.396 | 0.395 |
| Dep. var. mean | -1.912 | -1.905 | -1.921 | -1.916 | -1.916 | -1.911 |
| Person-Year observations | 12,334 | 12,334 | 9,225 | 9,225 | 8,298 | 8,298 |
| Person observations | 6,691 | 6,691 | 5,091 | 5,091 | 4,808 | 4,808 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the national (resp. NUTS-2) cultural similarity index for odd-numbered (resp. even-numbered) columns. Columns 1 and 2 include the entire sample of refugees, regardless of their mobility status. Columns 3 and 4 restirct the sample to refugees who stayed at the location of assignment, and columns 5 and 6 restict the sample to refugees who are required by law to stay in the location of assignment. Mobility restrictions applies to individuals whose asylum appication (i) got rejected or (ii) asylum approval was in 2016 or later. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. All regressions control for the composition of questions used in the cultural similarity index. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status, and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.5. Probability of ex-post sorting: Refugees and locals

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Probability of moving out | | | | |
| | Refugees | Locals | | | |
| MSA | 0.184*** | 0.024 | -0.383 | -0.260 | -0.285 |
| | (0.050) | (0.113) | (0.296) | (0.296) | (0.294) |
| MSA × Threat | -0.010 | | | | |
| | (0.035) | | | | |
| Refugee share | | 0.024 | -0.383 | -0.260 | -0.285 |
| | | (0.113) | (0.296) | (0.296) | (0.294) |
| Refugee share × Threat | | 0.036 | -0.079 | -0.086 | 0.006 |
| | | (0.072) | (0.203) | (0.193) | (0.203) |
| Refugee share × Threat | | | 0.020 | | |
| × impact refugees on economy | | | (0.028) | | |
| Refugee share × Threat | | | | 0.020 | |
| × impact refugees on cultural life | | | | (0.025) | |
| Refugee share × Threat | | | | | 0.005 |
| × impact refugees on Germany as place to live | | | | | (0.030) |
| R2 adjusted | 0.355 | 0.017 | 0.023 | 0.023 | 0.023 |
| Person-Year observations | 12,334 | 113,711 | 33,234 | 33,234 | 33,234 |
| Person observations | 6,691 | 30,073 | 21,266 | 21,266 | 21,266 |
| Individual controls | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | |
| District | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes |

*Notes:* In Panel A, the sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is a dummy indicating whether the respondent lives at the time of the interview in a region different from the region of assignment. Range of answers for impact refugees on economy. cultural life, and on Germany as a place to live are 1 bad - 11 good, 1 undermine-11 enrich, and 1 worse - 11 better respectively. In Panel B, the sample consists of 30,073 locals for a total of 113,711 local-year observations for years 2013-2018. The dependent variable is a dummy indicating whether the respondent moved out of the region the year following the observation. MSA refers to months since arrival. Refugee share, in percent, is the refugee share in the district population, measured on December of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized within each model. Coefficients and standard errors are multiplied by 100 for presentation. Locals' assessment of refugees measured in survey years 2016 and 2018. In column 1, the regression includes dummies for missing control variables and survey year, and individual controls (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). Column 2 adds the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Columns 3, 4 and 5 add federal state, NUTS-2 region, and district fixed effects. In columns 2-5, all regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, highest education among 4 categories, and migration background: none, indirect, 5 years ago or less, 6-10 years, more than 10 years), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.6. Probability of panel attrition: Threat and cultural similarity (CS)

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Probability of attrition (mean: 0.347) | | | | |
| MSA | 0.073 | 0.149** | 0.079 | 0.155** | 0.156** |
| | (0.058) | (0.061) | (0.058) | (0.061) | (0.061) |
| CS | | 0.969 | | 0.940 | 1.020 |
| | | (1.315) | | (1.315) | (1.315) |
| MSA × CSI | | -0.007 | | -0.007 | -0.009 |
| | | (0.046) | | (0.046) | (0.045) |
| MSA × Threat | | | 0.055 | 0.055 | 0.056 |
| | | | (0.054) | (0.054) | (0.054) |
| Threat × CSI | | | | | -0.412 |
| | | | | | (1.306) |
| MSA × Threat × CSI | | | | | -0.007 |
| | | | | | (0.048) |
| R2 adjusted | 0.072 | 0.073 | 0.072 | 0.073 | 0.073 |
| Person-Year observations | 8,643 | 8,643 | 8,643 | 8,643 | 8,643 |
| Person observations | 6,331 | 6,331 | 6,331 | 6,331 | 6,331 |
| Individual controls | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | |
| District | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,331 refugees for a total of 8,643 refugee-year observations. The dependent variable is a dummy equal to one if the refugee dropped out of the survey in the next year. MSA refers to months since arrival. CSI is the cultural similarity index. Threat is the threat index described in the text. Threat and cultural similarity are z-standardized within each estimated model. Coefficients and standard errors multiplied by 100 for presentation. The table presents: i) the effect of months since arrival alone on attrition (column 1); ii) the effect of its interactions with cultural similarity index and threat index, separately and together (columns 2, 3, and 4); and iii) the triple interaction of months since arrival, threat index and cultural similarity index (column 5). All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Columns 2, 4 and 5 control for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.7. Cultural assimilation: Alternative index

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | *Panel A. Canberra index (mean: -0.353)* | | | | | |
| MSA | -0.001 | 0.000 | -0.000 | 0.000 | 0.001 | 0.001 |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| MSA × Threat | | 0.013*** | 0.012*** | 0.014*** | 0.015*** | 0.015*** |
| | | (0.004) | (0.004) | (0.004) | (0.004) | (0.005) |
| R2 adjusted | 0.163 | 0.163 | 0.163 | 0.164 | 0.164 | 0.164 |
| | *Panel B. Abs. deviation from local mean (mean: -1.413)* | | | | | |
| MSA | 0.167*** | 0.177*** | 0.176*** | 0.178*** | 0.179*** | 0.180*** |
| | (0.058) | (0.058) | (0.058) | (0.058) | (0.058) | (0.058) |
| MSA × Threat | | 0.114*** | 0.099** | 0.117*** | 0.125*** | 0.110** |
| | | (0.036) | (0.039) | (0.037) | (0.038) | (0.044) |
| R2 adjusted | 0.200 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| Survey year | Yes | Yes | Yes | Yes | Yes | Yes |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the Canberra (resp. Herfindahl) cultural similarity index in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, for the composition of questions included in the cultural similarity index, and individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). Column 2 adds interaction between year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Columns 3, 4, and 5 add respectively federal state, NUTS-2 region, and district fixed effects to the specification of column 2. Column 6 includes the interaction between months since arrival and the standardized threat index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.8. Cultural assimilation: Alternative definitions

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | *Panel A. Cultural similarity index, 12-components (mean: -1.745)* | | | | | |
| MSA | 0.115*** | 0.122*** | 0.121*** | 0.122*** | 0.122*** | 0.122*** |
| | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) |
| MSA × Threat | | 0.073*** | 0.064*** | 0.073*** | 0.074*** | 0.062*** |
| | | (0.019) | (0.020) | (0.019) | (0.020) | (0.022) |
| R2 adjusted | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| | *Panel B. Cultural similarity index, native-born only (mean: -1.905)* | | | | | |
| MSA | 0.129*** | 0.137*** | 0.136*** | 0.138*** | 0.139*** | 0.139*** |
| | (0.041) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat | | 0.088*** | 0.075*** | 0.091*** | 0.096*** | 0.083*** |
| | | (0.026) | (0.028) | (0.026) | (0.028) | (0.032) |
| R2 adjusted | 0.385 | 0.386 | 0.386 | 0.386 | 0.386 | 0.386 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| Federal-State | No | No | Yes | No | No | No |
| NUTS-2 | No | No | No | Yes | No | No |
| District | No | No | No | No | Yes | Yes |
| District controls × survey year | No | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the 12-component cultural similarity index (resp. the cultural similarity index to native-born Germans only) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, for the composition of questions included in the cultural similarity index, and individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). Column 2 adds interaction between year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Columns 3, 4, and 5 add respectively federal state, NUTS-2 region, and district fixed effects to the specification of column 2. Column 6 includes the interaction between months since arrival and the standardized threat index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.9. Cultural similarity index: Step-wise drop of components

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| CSI component omitted: | Baseline: All included | Risk | Negative reciprocity | Positive reciprocity | Leisure activities | Politics | Locus of control | Trust | Egoistic society |
| MSA | 0.274*** | 0.297*** | 0.271*** | 0.238*** | 0.126 | 0.283*** | 0.287*** | 0.332*** | 0.318*** |
| | (0.088) | (0.060) | (0.090) | (0.085) | (0.084) | (0.086) | (0.086) | (0.093) | (0.095) |
| MSA × Threat | 0.177*** | 0.142*** | 0.149** | 0.170*** | 0.165*** | 0.162*** | 0.170*** | 0.174** | 0.181** |
| | (0.066) | (0.045) | (0.068) | (0.064) | (0.062) | (0.062) | (0.065) | (0.071) | (0.072) |
| R2 adjusted | 0.393 | 0.708 | 0.369 | 0.441 | 0.420 | 0.432 | 0.419 | 0.304 | 0.289 |
| Person-Year observations | 12,334 | 12,325 | 12,334 | 12,331 | 12,322 | 12,270 | 12,333 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,689 | 6,691 | 6,691 | 6,686 | 6,658 | 6,691 | 6,691 | 6,691 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the z-standardized cultural similarity index. Column 1, shows the baseline CSI with all components and referred throughout the paper. Then, the index is calculated with step-wise omission of its components (from column 2 to 9). See Table C.3 for the exact source and definition of each component of the cultural similarity index (CSI). MSA refers to months since arrival. Threat is the threat index described in the text. Threat and cultural similarity are z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Additionally, all regressions include composition dummies. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.10. Cultural assimilation: Measuring locals' preference at endline

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Cultural similarity index | | | | | |
| | *Panel A. Local culture measured at baseline (mean: -1.912)* | | | | | |
| MSA | 0.120*** | 0.128*** | 0.127*** | 0.129*** | 0.129*** | 0.129*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat | | 0.087*** | 0.074*** | 0.090*** | 0.095*** | 0.082*** |
| | | (0.026) | (0.028) | (0.026) | (0.027) | (0.031) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 |
| | *Panel B. Local culture measured at endline (mean: -1.899)* | | | | | |
| MSA | 0.128*** | 0.136*** | 0.135*** | 0.136*** | 0.137*** | 0.137*** |
| | (0.038) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| MSA × Threat | | 0.085*** | 0.074*** | 0.087*** | 0.091*** | 0.079*** |
| | | (0.024) | (0.026) | (0.024) | (0.025) | (0.029) |
| R2 adjusted | 0.410 | 0.411 | 0.411 | 0.411 | 0.411 | 0.411 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Survey years × | | | Unemp. rate | Pop. density | Refugee share | All |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| Survey year | Yes | Yes | Yes | Yes | Yes | Yes |
| District | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index, where local culture is measured at baseline in Panel A (identical to the main specification), and at endline in Panel B. MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, for the composition of questions included in the cultural similarity index, and individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival). Column 2 adds interaction between year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Columns 3, 4, and 5 add respectively federal state, NUTS-2 region, and district fixed effects to the specification of column 2. Column 6 includes the interaction between months since arrival and the standardized threat index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.11. Cultural and Economic assimilation, threat at endline

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Right-wing crimes against refugees (2015-2018) | | | | | |
| Threat component of interest: | AfD voting share 2017 | NPD voting share 2017 | Openness 2017 | Right-wing extr. demos, 2015-2018 | Physical assault and murder | Incitement to commit crimes | Arson, damage to property, theft | Threat or insult | Other | PC 1 |
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | | | | | | | |
| MSA | 0.125*** | 0.125*** | 0.122*** | 0.124*** | 0.125*** | 0.123*** | 0.124*** | 0.125*** | 0.122*** | 0.127*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| MSA × Threat component (at endline) | 0.031 | 0.028 | -0.090*** | 0.051* | 0.041 | 0.112*** | 0.091*** | 0.055* | 0.062** | 0.081*** |
| | (0.029) | (0.030) | (0.026) | (0.028) | (0.031) | (0.027) | (0.029) | (0.031) | (0.027) | (0.030) |
| R2 adjusted | 0.393 | 0.393 | 0.394 | 0.393 | 0.393 | 0.394 | 0.394 | 0.393 | 0.393 | 0.393 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | | | | | | | |
| MSA | 0.769*** | 0.772*** | 0.771*** | 0.770*** | 0.773*** | 0.771*** | 0.772*** | 0.774*** | 0.771*** | 0.771*** |
| | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) | (0.042) |
| MSA × Threat component (at endline) | -0.019 | 0.015 | -0.020 | -0.017 | 0.031 | 0.004 | 0.028 | 0.040 | -0.044 | 0.006 |
| | (0.028) | (0.029) | (0.027) | (0.027) | (0.032) | (0.028) | (0.031) | (0.032) | (0.027) | (0.030) |
| R2 adjusted | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 | 0.180 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 | 6,691 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index measured at endline described in Appendix C.2.4, and is z-standardized within each estimated model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, for the composition of questions included in the cultural similarity index only in Panel A, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Column 1 through 4 include various threat components measured at endline, and are AfD voting share in 2017, NPD voting share in 2017, Big-5 Openness measured in 2017, and the number of right-wing extremist demonstrations between 2015 and 2018. Column 5 through 9 present different categories of right-wing crimes against refugees between 2015-2018 which are: i) physical assault and murder (column 5); incitement of the people or to commit crimes; including the use of swastikas (column 6); arson, damage to property, theft committed against refugees (column 7); threats or insults (column 8); and, other actions that would be considered as a right-wing crime against refugees. (column 9). Lastly, the first principal component of threat at endline is used (column 10). Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.12. Refugee inflows and changes in local culture

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Risk preference | Negative reciprocity | Positive reciprocity | Leisure, Cultural activity | Politics interest | Locus of control | Trust | Egoistic-altr. society |
| | *Panel A. Refugee share only* | | | | | | | |
| Refugee share | -0.300 | -4.244 | -6.864 | 2.010 | 1.314 | 0.801 | -1.015 | -1.256 |
| | (0.545) | (5.293) | (5.889) | (1.116) | (0.467) | (5.450) | (1.273) | (1.433) |
| | [0.994] | [0.994] | [0.983] | [0.942] | [0.653] | [0.994] | [0.994] | [0.994] |
| R2 overall | 0.011 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| R2 between | 0.016 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |
| R2 within | 0.020 | 0.088 | 0.046 | 0.052 | 0.009 | 0.045 | 0.036 | 0.038 |
| | *Panel B. Refugee share and interaction with threat* | | | | | | | |
| Refugee share | 0.116 | -4.219 | -6.877 | 1.672 | 1.421 | 0.801 | -1.094 | -1.897 |
| | (0.558) | (5.292) | (5.889) | (1.145) | (0.479) | (5.450) | (1.299) | (1.459) |
| | [0.977] | [0.977] | [0.977] | [0.977] | [0.606] | [0.977] | [0.977] | [0.977] |
| Refugee share × Threat | -1.180 | 5.604 | -4.381 | 0.861 | -0.292 | 3.504 | 0.236 | 2.014 |
| | (0.339) | (3.659) | (4.069) | (0.658) | (0.289) | (3.742) | (0.774) | (0.863) |
| | [0.398] | [0.952] | [0.964] | [0.958] | [0.964] | [0.964] | [0.964] | [0.797] |
| R2 overall | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| R2 between | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| R2 within | 0.020 | 0.088 | 0.046 | 0.052 | 0.009 | 0.045 | 0.036 | 0.038 |
| Person-Year observations | 205,833 | 36,197 | 36,229 | 40,437 | 198,992 | 34,894 | 40,980 | 39,832 |
| Person observations | 48,860 | 28,950 | 28,954 | 30,453 | 48,378 | 27,964 | 29,521 | 28,944 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 48,860 locals for a total of 205,833 local-year observations between survey years 2010-2019. The dependent variables are the dimensions of the cultural similarity index detailed in Table C.3, and are z-standardized within each model. Refugee share refers to the percent of refugees at district-level measured on December 31 of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized within each model. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, highest education among 4 categories, and migration background: none, indirect, 5 years ago or less, 6-10 years, more than 10 years), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. P-values, shown in brackets, are adjusted for multiple hypotheses testing by controlling the familywise error rate (FWER) using the Romano-Wolf procedure (Clarke et al., 2020; Romano & Wolf, 2016, 2005a,b). Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.13. Alternative standard errors

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | Conley standard errors | | | |
| | Baseline | Cluster district | Spatial: distance 33.15 km | Spatial: distance 66.30 km | Network: direct neighbor | Network: neighbor of neighbor |
| | *Panel A. Cultural similarity index (mean: -1.912)* | | | | | |
| MSA | 0.129*** | 0.129*** | 0.129*** | 0.129*** | 0.129*** | 0.129*** |
| | (0.041) | (0.049) | (0.045) | (0.041) | (0.047) | (0.046) |
| MSA × Threat | 0.082*** | 0.082* | 0.082** | 0.082** | 0.082** | 0.082* |
| | (0.031) | (0.045) | (0.041) | (0.037) | (0.041) | (0.042) |
| R2 centered | 0.413 | 0.413 | 0.413 | 0.413 | 0.413 | 0.413 |
| | *Panel B. Refugees' relative employment (mean: -0.507)* | | | | | |
| MSA | 0.772*** | 0.772*** | 0.772*** | 0.772*** | 0.772*** | 0.772*** |
| | (0.042) | (0.044) | (0.047) | (0.045) | (0.045) | (0.048) |
| MSA × Threat | 0.016 | 0.016 | 0.016 | 0.016 | 0.016 | 0.016 |
| | (0.032) | (0.037) | (0.038) | (0.040) | (0.033) | (0.036) |
| R2 centered | 0.205 | 0.205 | 0.205 | 0.205 | 0.205 | 0.205 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 | 12,334 |
| Person observations | 6,691 | 354 | 6,691 | 6,691 | 6,691 | 6,691 |
| Individual controls | No | No | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | |
| District | No | No | Yes | Yes | Yes | Yes |
| District controls × survey year | No | No | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text, and is z-standardized within each model. See Table D.3 for the definition of mediators. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Panel A always controls for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are: i) clustered at the person-level (column 1); ii) clustered at the district-level (column 2); iii) Conley standard errors allowing correlation between districts whose borders are less than 33.15 km (resp. 66.30 km) away (column 3, resp. column 4); and iv) Conley standard errors allowing correlation with neighboring districts (resp. neighboring districts and neighbors of neighbors) in column 5 (resp. column 6). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.14. Additional robustness checks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Robustness check | Baseline | East Germany × survey year | Origin country group × survey year | Origin country distance × survey year | Arrival year fixed effects | Include only 1st person observation | 2SLS |
| | *Panel A. Cultural similarity index* | | | | | | |
| MSA | 0.129*** | 0.130*** | 0.138*** | 0.132*** | 0.070 | 0.123** | 0.138*** |
| | (0.041) | (0.041) | (0.042) | (0.042) | (0.107) | (0.052) | (0.041) |
| MSA × Threat | 0.082*** | 0.092*** | 0.078** | 0.080** | 0.079** | 0.152*** | 0.103*** |
| | (0.031) | (0.035) | (0.031) | (0.031) | (0.031) | (0.050) | (0.038) |
| R2 adjusted | 0.393 | 0.393 | 0.394 | 0.393 | 0.394 | 0.265 | 0.392 |
| Dep. var. mean | -1.912 | -1.912 | -1.912 | -1.911 | -1.912 | -2.027 | -1.912 |
| Cragg-Donald Wald F-stat | | | | | | | 412.7 |
| Kleibergen-Paap Wald rk F-stat | | | | | | | 735.3 |
| | *Panel B. Refugees' relative employment* | | | | | | |
| MSA | 0.772*** | 0.772*** | 0.772*** | 0.775*** | 0.904*** | 0.643*** | 0.774*** |
| | (0.042) | (0.042) | (0.042) | (0.042) | (0.103) | (0.050) | (0.042) |
| MSA × Threat | 0.016 | 0.008 | 0.012 | 0.015 | 0.006 | 0.063 | 0.020 |
| | (0.032) | (0.035) | (0.032) | (0.032) | (0.032) | (0.050) | (0.040) |
| R2 adjusted | 0.180 | 0.180 | 0.181 | 0.180 | 0.181 | 0.098 | 0.180 |
| Dep. var. mean | -0.507 | -0.507 | -0.507 | -0.507 | -0.507 | -0.577 | -0.507 |
| Cragg-Donald Wald F-stat | | | | | | | 412.4 |
| Kleibergen-Paap Wald rk F-stat | | | | | | | 733.9 |
| Person-Year observations | 12,334 | 12,334 | 12,334 | 12,333 | 12,334 | 6,665 | 12,334 |
| Person observations | 6,691 | 6,691 | 6,691 | 6,690 | 6,691 | 6,665 | 6,691 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,691 refugees for a total of 12,334 refugee-year observations. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text. Threat is the threat index described in the text, and is z-standardized within each model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Panel A always controls for dummies for the composition of questions included in the cultural similarity index. Column 1 presents the baseline regression (column 6 of Table 1). Columns 2, 3, and 4 add interactions between year dummies and, respectively: East Germany; origin country groups (Syria, Afghanistan, Iraq, Iran, Africa, Western Balkans, former USSR, Eritrea, and other) and the distance between the origin country and centroid of the region of assignment. Column 5 includes arrival year fixed-effects. Column 6 reports results using using refugees who were interviewed only once and, for those who were interviewed multiple times, considers only the first date of interview. Column 7 estimates 2SLS regressions, instrumenting threat in the region of residence using threat measured in the region of assignment. Column 7 additionally reports the Cragg-Donald Wald F-statistic for the overall strength of instruments and the Kleibergen-Paap Wald rk F-statistic for the joint significance of instruments used in the specification. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

# Appendix C: Data Appendix

## C.1 Variables' Definition and Survey Questions

Table C.1. Threat index: Description and data sources

| Threat component | Description | Source |
|---|---|---|
| Voting share of NSDAP in elections 1933 | Absolute number of votes for the National Socialist German Workers' Party (NSDAP) over the absolute number of valid votes in the 1933 parliamentary elections; mapped from the level of historical administrative district boundaries to today's NUTS-2 regions. | Falter & Hänisch (1990) |
| Pogroms against Jews in 1920s | Reported pogroms in Germany in the 1920s are aggregated from the level of towns to NUTS-2 regions (based on provided longitude and latitude). According to Voigtländer & Voth (2012), Appendix (p.1): "We define a pogrom as a violent outrage against the Jewish population, involving physical violence against and/or the killings of people. Therefore, political agitation through *Brandreden* (incendiary speeches), attacks on Jewish shows, or the desecration of cemeteries are not coded as pogroms. Only when physical violence against at least one Jewish inhabitant is mentioned in *Alicke* does this variable take the value of unity." | Voigtländer & Voth (2012) |
| Voting share of far-right party NPD in Federal elections 2013 | Results are provided online for download by the Bundeswahlleiter (Federal Returning Officer), which is responsible for supervising the proper organization and conduct of Federal elections in Germany. In the German election system, voters cast two votes: first votes are directly given to local representatives; second votes are decisive for the representation of parties in the parliament. The vote shares of the far-right National Democratic Party of Germany (NPD) are calculated as the share of second votes out of all valid votes. | Bundeswahlleiter (2013) |
| Offenses against Muslim communities | insults, threats, attacks against mosques and disturbance of religious practice (2001-2011). Answer of the Federal government to a parliamentry query of the party *Die Linke* (far-left party). Data shared by Colussi et al. (2021). Original source: Federal parliamentary printed matter 17/9523 (2012). For the construction of our index, we cumulate the number of violent attacks. | Colussi et al. (2021) |
| Right-wing marches | This is a dataset on right-wing extremist demonstrations that took place in Germany between 2005 and 2020. The authors used the German federal government's answers to brief parliamentary questions (*Kleine Anfragen*) tabled by the opposition left-wing party *Die Linke* to create this dataset. The dataset consists of more than 3,000 observations and includes information on the location, date, number of participants, organizing actors, and the mottos of the right-wing extremist demonstrations. For the construction of our index, we limit the time frame to pre-2013 and calculate the cumulated number of participants in right-wing extremist demonstration per 100,000 inhabitants as of 2012. | Kanol & Knoesel (2021) |
| Understanding for attacks on asylum seekers' homes | Question from ALLBUS (2021) survey 2008. Share of respondents answering 0 or higher to the following question: "I can understand that people carry out attacks on homes for asylum seekers (-2 Do not agree at all - +2 Completely agree)." | German General Social Survey (ALLBUS, 2021) |
| Immigrant adaptation | ALLBUS (2021) survey 2010, 2012 (pooled): Foreigners living in Germany should adapt their way of life a little more closely to the German way of life. (1 completely disagree - 7 completely agree). We calculate the share of respondents responding 6 or higher. | German General Social Survey (ALLBUS, 2021) |
| Labor market competition | Question from ALLBUS (2021) survey 2010, 2012 (pooled). Share of respondents answering 6 or higher to the following question: "When jobs get scarce, the foreigners living in Germany should be sent home again (1 completely disagree - 7 completely agree)." | German General Social Survey (ALLBUS, 2021) |
| Political participation of immigrants | Question from ALLBUS (2021) survey 2010, 2012 (pooled). Share of respondents answering 6 or higher to the following question: "Foreigners living in Germany should be prohibited from taking part in any kind of political activity in Germany (1 completely disagree - 7 completely agree)." | German General Social Survey (ALLBUS, 2021) |
| Social isolation | Question from ALLBUS (2021) survey 2010, 2012 (pooled). Share of respondents answering 6 or higher to the following question: "Foreigners living in Germany should choose to marry people of their own nationality (1 completely disagree - 7 completely agree)." | German General Social Survey (ALLBUS, 2021) |
| "Openness" (Big-5 personality trait) | Average of the Big-5 personality traits dimension "Openness" at the local population in the NUTS-2 region in the SOEP survey year 2013. In SOEP, each of the Big-5 personality traits is generated from three survey questions (Gerlitz, Schupp 2005). We calculate "Openness" as the average over the agreement to the following items (each scaled from 1 does not apply at all - 7 absolutely): (1) I have a vivid fantasy, imagination, (2) I am original, bring in new ideas, (3) I value artistic, aesthetic experiences. | Own calculations based on SOEP (2020) |

*Notes:* The table lists the name, description, and source of each threat component used to compute the threat index.

Table C.2. Correlation of threat variables

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vote for NSDAP in 1933 | (1) | 1.00 | | | | | | | | | | |
| Pogroms in the 1920s | (2) | 0.30 | 1.00 | | | | | | | | | |
| | | (0.00) | | | | | | | | | | |
| Vote for NPD in 2013 | (3) | 0.12 | 0.06 | 1.00 | | | | | | | | |
| | | (0.00) | (0.00) | | | | | | | | | |
| Mosque attacks | (4) | -0.25 | -0.01 | -0.32 | 1.00 | | | | | | | |
| | | (0.00) | (0.33) | (0.00) | | | | | | | | |
| Right-wing marches | (5) | 0.06 | 0.04 | 0.80 | -0.28 | 1.00 | | | | | | |
| | | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | |
| Agreement to attacks against immigrants | (6) | -0.06 | -0.14 | 0.51 | -0.09 | 0.36 | 1.00 | | | | | |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | |
| Immigrant adaptation | (7) | 0.08 | 0.10 | 0.60 | -0.14 | 0.49 | 0.12 | 1.00 | | | | |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | |
| Labor market competition | (8) | 0.18 | 0.03 | 0.63 | -0.27 | 0.51 | 0.35 | 0.48 | 1.00 | | | |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | |
| Prohibition of political activity | (9) | 0.30 | -0.05 | 0.43 | -0.14 | 0.31 | 0.22 | 0.48 | 0.54 | 1.00 | | |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | |
| Intermarriage | (10) | 0.01 | -0.12 | 0.65 | -0.19 | 0.53 | 0.49 | 0.63 | 0.61 | 0.62 | 1.00 | |
| | | (0.12) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | |
| Big-5 Openness | (11) | -0.19 | -0.14 | -0.03 | -0.17 | 0.01 | 0.20 | -0.13 | -0.11 | -0.11 | -0.12 | 1.00 |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.56) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | |

*Notes:* The table presents the correlation between each pair of threat variables. The correspondence between the top numbers and variables is given by the numbers on the left. Variables are described in Table C.1. Significance levels are in parentheses.

Table C.3. Survey questions used for baseline cultural similarity index

| Outcome variables | | | Survey year | |
|---|---|---|---|---|
| Category | Question | Scale | Refugees | Locals |
| Risk | In general, are you someone who is ready to take risks or do you try to avoid risks? | 0 - 10 | 2016-18 | 2012 |
| Positive reciprocity | If someone does me a favor, I am willing to reciprocate it | 1 - 7 | 2016-18 (Bio) | 2010 |
| | I make a particular effort to help someone who has previously helped me. | 1 - 7 | 2016-18 (Bio) | 2010 |
| | I am prepared to incur costs myself to help someone who has previously helped me. | 1 - 7 | 2016-18 (Bio) | 2010 |
| Negative reciprocity | If someone does me a serious wrong, I will get my own back at any price at the next opportunity. | 1 - 7 | 2016-18 (Bio) | 2010 |
| | If somebody puts me in a difficult position, I will do the same to them. | 1 - 7 | 2016-18 (Bio) | 2010 |
| | If someone insults me, I will insult them. | 1 - 7 | 2016-18 (Bio) | 2010 |
| Leisure activities | How often do you go to eat or drink in a cafe, restaurant or bar? | 1 - 5 | 2017-18 | 2013 |
| | Artistic and musical activities (painting, music, photography, theater, dance) | 1 - 5 | 2017-18 | 2013 |
| | Taking part in sports | 1 - 5 | 2017-18 | 2013 |
| | Going to sporting events | 1 - 5 | 2017-18 | 2013 |
| | Going to the cinema, pop concerts, dance events, clubs | 1 - 5 | 2017-18 | 2013 |
| | Going to cultural events such as opera, classical concerts, theater, exhibitions | 1 - 5 | 2017-18 | 2013 |
| Politics | Once spoken in general terms: How interested are you in politics | 1 - 4 | 2016-18 | 2012 |
| Locus of control | How my life goes depends on me | 1 - 7 | 2016 | 2010 |
| | Compared to other people, I have not achieved what I deserve | 1 - 7 | 2016 | 2010 |
| | What a person achieves in life is above all a question of fate or luck | 1 - 7 | 2016 | 2010 |
| | If a person is socially or politically active, he/she can have an effect on social conditions | 1 - 7 | 2016 | 2010 |
| | I frequently have the experience that other people have a controlling influence over my life | 1 - 7 | 2016 | 2010 |
| | One has to work hard in order to succeed | 1 - 7 | 2016 | 2010 |
| | If I run up against difficulties in life, I often doubt my own abilities | 1 - 7 | 2016 | 2010 |
| | The opportunities that I have in life are determined by the social conditions | 1 - 7 | 2016 | 2010 |
| | Inborn abilities are more important than any efforts one can make | 1 - 7 | 2016 | 2010 |
| | I have little control over the things that happen in my life | 1 - 7 | 2016 | 2010 |
| Trust | People can generally be trusted | 1 - 4 | 2018 | 2013 |
| | Nowadays you can't rely on anyone | 1 - 4 | 2018 | 2013 |
| | If you are dealing with strangers, it is better to be careful before trusting them | 1 - 4 | 2018 | 2013 |
| Egoistic society | Do you believe that most people would use you if they had the chance or that they would try to be fair to you? | 1 - 2 | 2018 | 2013 |
| | Would you say that people usually try to be helpful or that they only pursue their own interests? | 1 - 2 | 2018 | 2013 |

*Notes:* The table lists the survey questions used to construct the main cultural similarity index, their classification in categories, the range of possible answers, and the years they have been asked to refugees and locals. Scales include: Risk, 0 - 10 with 0 risk averse - 10 fully prepared to take risks, Negative reciprocity, positive reciprocity and locus of control 1 - 7 with 1 Absolutely does not apply - 7 Fully applies, leisure activities 1 - 5 with 1 Never - 5 Daily, Politics 1-4 with 1 not at all - 4 very strong, Trust 1 -4 with 1 Not at all - 4 fully agree, egoistic society fairness 1-2 with 1 exploit - 2 fair, and egoistic society helpful with 1 own interest - 2 helpful.

Table C.4. Additional questions included in the 12-component index

| Outcome variables | | | Survey year | |
|---|---|---|---|---|
| Category | Question | Scale | Refugees | Locals |
| Satisfaction | How satisfied are you currently with your life in general? | 0 - 10 | 2016-18 | 2012 |
| | How satisfied are you with your current health? | 0 - 10 | 2016-18 | 2012 |
| | How satisfied are you in general with your current living arrangements? | 0 - 10 | 2016-18 | 2012 |
| Worries | Are you worried about your own economic situation? | 1 - 3 | 2016-18 | 2012 |
| | Are you worried about your health? | 1 - 3 | 2016-18 | 2012 |
| Social inclusion | How often do you miss the company of other people? | 1 - 5 | 2016-18 (Bio) | 2013 |
| | How often do you feel left out? | 1 - 5 | 2016-18 (Bio) | 2013 |
| | How often do you feel socially isolated? | 1 - 5 | 2016-18 (Bio) | 2013 |
| Self attitude | I have a positive attitude towards myself | 1 - 7 | 2016-18 (Bio) | 2010 |

*Notes:* The lists the survey questions used, in addition to variables in Table C.3, to construct the 12-component cultural similarity index, their classification in categories, the range of possible answers, and the years they have been asked to refugees and locals. Scales include: Satisfaction 0 - 10 with 0 Completely dissatisfied - 10 Completely satisfied, Worries 1-3 with 1 No, no worry - 3 Yes, big worry, Social inclusion 1-5 with 1 Never - 5 Very often, and Self attitude 1-7 with 1 Absolutely does not apply - 7 Fully applies.

Table C.5. Questions used for correlation with components of cultural similarity index

| **Outcome variables** | | | **Survey year** |
|---|---|---|---|
| Category | Question | Scale | |
| | *Panel A: Political preferences and attitudes* | | |
| Satisfaction German democracy | How satisfied are you with democracy as it exists in Germany? | 0 - 10 | 2010, 2016 |
| Voted in last German parliamentary election | Did you vote in the last German parliamentary election on September 27, 2009? | 0 - 1 | 2010 |
| Concern: The impact of climate change | What is your attitude towards the following areas; are you concerned about them? - The impacts of climate change | 0 - 3 | 2009, 2010, 2012-2019 |
| Concern: Immigration to Germany | What is your attitude towards the following areas; are you concerned about them? - Immigration to Germany | 0 - 3 | 2009, 2010, 2012-2019 |
| Political attitudes | In politics people often talk about "left" and "right" when it comes to characterize different political attitudes. If you think about your own political views: Where would you place yours? | 0 - 10 | 2009, 2014, 2019 |
| | *Panel B: Cultural preferences* | | |
| Good that gay marriage is recognized | I will read you a series of statements. To what degree do you personally agree with each statement? - I think it is good that marriages between two women or two men are legally recognized. | 1 - 7 | 2018 |
| Best if man and woman work the same | will read you a series of statements. To what degree do you personally agree with each statement? -It's best if the man and the woman work the same amount so they can share the responsibility for taking care of the family and household equally. | 1 - 7 | 2018 |
| Children under 6 suffer if the mother work | I will read you a series of statements. To what degree do you personally agree with each statement? - Children below the age of 6 suffer if their mother works. | 1 - 7 | 2018 |
| How often do you attend religious events | Which of the following activities do you take part in during your free time? Please check off how often you do each activity: at least once a week, at least once a month, less often, never. - Attending church, religious events | 1 - 5 | 2013, 2017-2019 |
| Not a member of any religious community | Are you a member of a church or religious community? - No, I do not belong to any religious community | 0 - 1 | 2013, 2015-2019 |
| | *Panel C: Preferences for redistribution and altruism* | | |
| Blood donations last 10 years | Did you donated blood at least once in the last year ? | 0 - 1 | 2010 |
| Amount given away if received 10,000€ gift | Imagine that you unexpectedly received a gift of 10,000 euros. How much would you save, how much would you give away,and how much would you spend? (You can either split up the money into the categories below or use the entire sum for one purpose; expressed in thousands) | 0 - 10 | 2010, 2017 |
| Fair that those who work harder earn more | People have different ideas about what makes a society just. What's your opinion about the following statements? - A society is just when people who work hard earn more than others | 1 - 7 | 2019 |
| Fair when income and wealth distributed equally | People have different ideas about what makes a society just. What's your opinion about the following statements? - A society just when the income and wealth in society are equally distributed among all people. | 1 - 7 | 2019 |

*Notes:* The table lists the survey questions used in each row of Table A.1.

Table C.6. Descriptive statistics: Components of the threat index

| | All | | | | | Below median threat | | | | | Above median threat | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N | Mean | Std. dev. | Min | Max | N |
| Historical pogroms | 0.55 | 0.50 | 0 | 1 | 12,334 | 0.72 | 0.45 | 0 | 1 | 6,022 | 0.39 | 0.49 | 0 | 1 | 6,312 |
| NSDAP vote share, 1933 | 43.97 | 7.98 | 29 | 60 | 12,334 | 43.95 | 6.91 | 31 | 58 | 6,022 | 43.99 | 8.89 | 29 | 60 | 6,312 |
| Attacks against mosques (2001-2011) | 2.34 | 2.13 | 0 | 9 | 12,334 | 3.16 | 2.45 | 0 | 9 | 6,022 | 1.56 | 1.37 | 0 | 4 | 6,312 |
| Percent locals who agree: ($\geq$ 6 out of 7) | | | | | | | | | | | | | | | |
| Foreigners should adapt way of life more | 55.34 | 6.98 | 43 | 73 | 12,334 | 51.48 | 5.77 | 43 | 62 | 6,022 | 59.02 | 5.98 | 48 | 73 | 6,312 |
| Foreigners go home when jobs are scarce | 9.01 | 4.68 | 1 | 21 | 12,334 | 5.91 | 2.47 | 1 | 11 | 6,022 | 11.97 | 4.36 | 3 | 21 | 6,312 |
| Foreigners marry same nationality | 6.71 | 3.26 | 1 | 17 | 12,334 | 4.36 | 1.59 | 1 | 7 | 6,022 | 8.94 | 2.84 | 5 | 17 | 6,312 |
| Foreigners prohibit polit. activ. | 11.23 | 4.41 | 3 | 21 | 12,334 | 8.29 | 1.95 | 4 | 12 | 6,022 | 14.03 | 4.28 | 3 | 21 | 6,312 |
| Percent locals understanding attacks on asylum-seeker homes ($\geq$ 2 out of 5) | 12.96 | 6.82 | 2 | 31 | 12,334 | 9.88 | 4.17 | 2 | 20 | 6,022 | 15.90 | 7.53 | 4 | 31 | 6,312 |
| NPD vote share (2013) | 1.26 | 0.71 | 1 | 4 | 12,334 | 0.89 | 0.20 | 1 | 1 | 6,022 | 1.62 | 0.82 | 1 | 4 | 6,312 |
| Participants in right-wing demonstrations per 100k inhabitants (2005-2012) | 238.72 | 321.93 | 20 | 2,259 | 12,334 | 103.22 | 56.01 | 20 | 228 | 6,022 | 367.98 | 406.58 | 25 | 2,259 | 6,312 |
| Big-5 Openness | 4.59 | 0.16 | 4 | 5 | 12,334 | 4.60 | 0.14 | 4 | 5 | 6,022 | 4.58 | 0.18 | 4 | 5 | 6,312 |

*Notes:* The table reports summary statistics for the components of the threat index for: i) the full sample in columns 1 to 5; and, ii) separately for regions with the threat index above (resp. below) the sample median in columns 6 to 10 (resp. in columns 11 to 15). These components are defined in Table C.1.

## C.2 Additional Datasets

### C.2.1 Administrative Data

As explained in the main text, we take advantage of a novel feature of the refugee survey, which allows us to link individual respondents to administrative data on daily employment and wages (Keita & Trübswetter, 2020). If informed consent for record linkage is obtained from respondents, the person-survey-ID is connected to social security records as part of the Integrated Employment Biographies (IEB) dataset of the Institute for Employment Research (IAB). The IEB is daily accurate spell data on employment (marginal and subject to social security), receipt of social benefits, registered job search, and participation in training measures (all through the Federal Employment Agency).[69] We can only link refugees that are dependently employed and not public servants. According to the official IAB data report by Keita & Trübswetter (2020), 84% of all respondents gave their consent to data linkage and about 60% (over 70% of those who had consented) could be linked. In our data, we end up with a linked sample of 7,618 refugee-year observations from 3,914 refugees (87% of individuals that were linked by Keita & Trübswetter, 2020).

This dataset is used to compute alternative measures of economic assimilation (relative employment and relative wages to local population) for the record linkage sample. These measures help us address potential concerns about misreporting of employment or wages in the survey sample. We also retrieve the share of foreigners (non-German citizens) working in the company where refugees are employed the day of the survey.[70]

### C.2.2 "Core" Cultural Values

In this section, we detail the construction of the index for "core" cultural values, used in Section 5.3 of the paper. When defining the index for women's rights, we combine information from five separate survey questions (all available only for first-time respondents of all survey years). All variables, which are reported in Table C.7 together with the exact wording of the question, range from 1 to 7, with higher (resp., lower) values reflecting more liberal views towards the role of women when a question reflects agreement (resp., disagreement) with the proposed statement. We proceed by first creating dummies for each individual question if the answer given by the respondent is strictly greater than 4 (or, in the case of disagreement, weakly below 3).[71] Then, we derive the share of items (out of 5) for which the aforementioned

[69] The IEB includes employees that are compulsorily registered for health, pension and statutory nursing care insurance. Also included are trainees and interns. Civil servants, self-employed persons, family workers, soldiers, and people in military or alternative service are excluded.

[70] The share of foreigners in the firm refers to June-30 of the survey year. This information is provided by Keita & Trübswetter (2020) in a separate enterprise file that can be merged based on the identifier of the company.

[71] Results are not sensitive to the threshold chosen to dichotomize each question.

dummy is equal to 1. Finally, to ease the interpretation of results, we standardize the index to have zero mean and standard deviation equal to 1.

To define the index of support for democracy, we proceed in a similar way. We first select the three questions available in the refugee survey that allow us to measure an individual's institutional preferences. As for women's rights, the answers range from 1 to 7 (Table C.7). Then, we create dummy variables using the same thresholds as for women's rights if an individual thinks that: the country should be democratic (answer strictly greater than 4); a strong leader should not over-rule the Parliament or election results (answer weakly lower than 3); and, that the government, rather than experts, should decide what is best for the country (answer weakly lower than 3).[72] Finally, we derive the share of items (out of 3) for which the indicator is equal to 1, and standardize the index to have zero mean and standard deviation equal to 1.

For both importance of religion and frequency of attendance of religious events, we could only find one question (each) in the survey. Thus, we only standardize the variables (to make them comparable to the index described above). However, in the analysis, we check the robustness of results to using (standardized) dummy variables.

### C.2.3 Additional Data Sources

We complement the datasets described in the main text (Section 3) with additional data sources. First, we obtain total population and the number of refugees at the district level at baseline (December 2012) from the German Federal Statistical Office (Destatis, 2021). Second, we retrieve data on regional unemployment rates across districts and the employment rates and median wages of immigrants at baseline (NUTS-2 and region-of-origin-specific) from the statistics department of the Federal Employment Agency (Bundesagentur für Arbeit, 2020). Third, to assess the robustness of our findings, we collect data on the characteristics of the local population, the supply of childcare, fiscal capacity, and housing market tightness at the district level at baseline.[73]

### C.2.4 Contemporaneous Threat

As described in Appendix B.7, we replicate results using a threat index measured at endline, rather than at baseline. To the extent possible, we take the same variables used in the construction of the baseline index (measured at a different point in time). We select nine variables, and then take their first principal component. First, we consider the vote share

[72] As before, results are unchanged when using different thresholds to define the dummy variables.

[73] These variables come from various sources, but are made available for download collectively by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (INKAR, 2021).

of the Alternative for Germany (AfD) and the NPD during the 2017 Federal elections, measured at the NUTS-2 regional level.[74] Second, we take the Big-5 personality traits dimension "Openness" averaged across SOEP respondents in each NUTS-2 region in survey year 2017. Third, we rely on data from Kanol & Knoesel (2021) to calculate the cumulated number of participants in far-right demonstrations at the NUTS-2 level between 2015 and 2018, per 100,000 inhabitants as of 2015. Finally, we use data on right-wing crimes against refugees committed between 2015 and 2018 at the NUTS-2 level, collected from the Federal government to parliamentary queries of the party *Die Linke*. We classify anti-refugee crimes into five categories: *i*) physical assault and murder; *ii*) incitement to commit crimes or use of swastikas; *iii*) arson, damage to property, and theft; *iv*) threat or insult; and, *v*) any other crime.[75] Based on the described variables, we compute the first principal component to construct an aggregate measure of contemporaneous threat. Each component and the index are then used in Appendix B.7 (Table B.11).

### C.2.5 Twitter Data

To measure the possible pro-refugee attitudes prevailing among locals, we rely on Twitter data. We scrape the universe of German-language tweets and retweets containing the hashtag *#refugeeswelcome* (the most common pro-refugee hashtag on Twitter in Germany) posted between January 2013 and December 2018.[76] Following the existing literature (Hatte et al., 2021; Fujiwara et al., 2021; Müller & Schwarz, 2020), we use the location indicated by users in their profile (when available) to map tweets to NUTS-2 regions. More precisely, we compare the location to a large dataset of existing locations provided by the website Openstreetmap.org to obtain the coordinates of the location.[77] We then exclude tweets: 1) whose users do not provide a valid location (e.g., "Narnia"); 2) that map to a location outside Germany; and, 3) that map to an area larger than a NUTS-2 region. We then assign each tweet to a NUTS-2 region. We end up with 182,000 geo-localized tweets, or 47% of the universe of 387,000 tweets.

Tweets containing the hashtag #refugeeswelcome, could express both pro- and anti-refugees views. To address this concern, we proceed in two steps. First, we manually classify a random sample of 1,000 tweets, and verify that only 7% of the tweets express anti-refugee

[74] Similarly to vote shares as part of our main threat index, we use the second votes, which are pivotal for the representation of parties in the German Parliament. The data comes from the *Bundeswahlleiter*, the Federal Returning Officer (Bundeswahlleiter, 2020).

[75] We thank Julia Bredtmann (RWI, Leibniz Institute for Economic Research) for kindly sharing the data on anti-refugee crimes with us. As many as 8,767 right-wing crimes against refugees were reported between 2015 and 2018. Their distribution was as follows: 21% physical assault or murder; 40% incitement to commit crimes of use of swastikas; 19% arson, damage to property, and theft; 17% threat or insult; 3% any other crime.

[76] The data were downloaded from `https://developer.twitter.com/en/products/twitter-api/academic-research`.

[77] This step was performed using the geocoding engine `https://nominatim.org/`.

views. Then, we use the sentiment classification neural network from Guhr et al. (2020) to classify tweets between positive, neutral, and negative sentiment.[78] We find that the manual and the neural network classifications of negative and positive tweets perfectly overlap in the sample of 1,000 tweets. This is true despite the fact that the neural network classification cannot distinguish between a pro- and an anti-refugee sentiment such as "it is completely unacceptable that we don't accept more refugees" and "it is completely unacceptable that we accept so many refugees". We are thus confident that classification based on the hashtag #refugeeswelcome already provides a selection of tweets that are overall positive.[79]

Since scraping was conducted in September 2021, our data set may differ from the one that would have been obtained by scraping the tweets during the period of interest. This can be for at least two reasons. First, we are only able to obtain tweets from users with active accounts, implying that we cannot measure tweets of users that deleted their account. Second, users may have changed their location between the time they tweeted about refugees and the time we scraped the data. In this case, we would locate the tweet at the new location of the user.[80]

In order to account for local Twitter penetration, we additionally collect a measure of Twitter usage for each NUTS-2 region in each year from 2013 to 2018. We sample 2 million tweets by selecting 20,000 random instants during this period and by collecting 100 tweets and retweets in German at each instant.[81] We locate tweets using the geographic information provided by the users. This gives us an estimate of the rate of tweets posted at each instant from each region (expressed as tweets per second), which is then aggregated at the region-year level. To proxy for the number of Twitter users in a NUTS-2 region, we instead rely on the number of users observed in the sample of tweets we collected at random instants.

In Appendix D.3, we use these data to define the number of tweets and retweets containing the hashtag *#refugeeswelcome* in a NUTS-2 region in each year: *i*) in levels; *ii*) scaled by 100,000 residents.[82] In addition, we define the number of tweets and retweets containing the hashtag *#refugeeswelcome* in a NUTS-2 region in each year both as a share of all tweets and scaled by the number of users.[83]

[78] The classification algorithm is based on a German-language version of the BERT architecture (Devlin et al., 2018), and its training data contains a sample of tweets.

[79] We confirm this by running the analysis in Appendix D.3 on the sample of all tweets and the sample of tweets classified as positive by the neural network and come to similar results.

[80] Similarly, users may have changed their profile or their stated (previously accurate) location to an invalid location.

[81] Since the Twitter API does not allow to search directly for all tweets in German, we search for tweets containing the 100 most frequent words in German, as listed by Sharoff (2006) on the website `http://corpus.leeds.ac.uk/frqc/`.

[82] See Table A.3 (Panel C) for the summary statistics.

[83] In a placebo exercise, we also use the number of tweets and the number of users separately. In Appendix D.3, we also check that results are unchanged when restricting attention to tweets that we classified as "positive" with the procedure described above.

### C.2.6 NGO Dataset

To the best of our knowledge, no exhaustive dataset with information about the presence of NGOs across German NUTS-2 regions over time exists. We use the website *Refugeeswelcomemap.de* to collect the (time-invariant) number of NGOs in a region.[84] Importantly, the NGOs listed there include only organizations that offer assistance services to refugees. Since postal codes determine the relevant NUTS code, we scrape the website and use geocoordinates of NGOs to allocate the latter across German NUTS-2 regions. Using this approach, we compiled a list of 1,000 NGOs located in Germany, which offered a variety of services (or, initiatives).

For each NGO, we could retrieve the following information: geographic location, contact information, and a two-level classification system for the type of services offered. The first level of such classification has four categories, which broadly group assistance services of the NGO into: *i*) Bureau/agency, public institution; *ii*) organizations for refugee aid or integration; *iii*) topic; and, *iv*) other. Each category is further divided in more detailed groups, in a second layer of classification. We do not cut the data across categories since, especially for initiatives in the second layer, definitions are often too specific to be considered separately. Instead, we count the number of initiatives (or, services) offered by each NGO. Our dataset includes a total of 4,356 initiatives (or, 4.3 initiatives per NGO).

According to the website, the list of initiatives refers to the year 2017. We thus take it as an approximate snapshot of the presence and activity of pro-refugee NGOs in a NUTS-2 region as of 2017. The dataset does not include the date of establishment, and we acknowledge that the list we were able to obtain is probably non-exhaustive. Nevertheless, we use this dataset in Appendix D.3 to complement the survey analysis presented in the main paper and the results obtained from Twitter data (also presented in Appendix D.3).

We define as dependent variable the number of NGO-led initiatives, and the number of NGO-led initiatives per 100,000 residents in a NUTS-2 region. Summary statistics for both variables are presented in Panel C of Table A.3.

[84] The exact link used is: `http://refugeeswelcomemap.de/deutschland/`. The data was last accessed in September 2021.

Table C.7. Survey questions used to measure "core values"

| Outcome variables | | | | |
|---|---|---|---|---|
| Category | Variable | Survey question | Scale | = 1 if |
| Women's rights | Having work makes women independent | Having a job is the best way for a woman to be independent. | 1 - 7 | $> 4$ |
| | Married women should work to be independent | Even a married woman should have a paid job so that she can be financially independent. | 1 - 7 | $> 4$ |
| | If women earn more, this creates problems | If a woman earns more money than her partner, this inevitably leads to problems. | 1 - 7 | $\leq 3$ |
| | Sons' education more important | For parents, vocational training or higher education for their sons should be more important than vocational training or higher education for their daughters. | 1 - 7 | $\leq 3$ |
| | Husband should have the last word | At home, the husband should have the final say | 1 - 7 | $\leq 3$ |
| System of government | Democracy best system | There should be a democratic system. | 1 - 7 | $> 4$ |
| | Strong leader | You need a strong leader who does not have to be concerned with a Parliament or elections. | 1 - 7 | $\leq 3$ |
| | Experts should decide | Experts, not the Government, should decide what is best for the country. | 1 - 7 | $\leq 3$ |
| Religion | Importance of religion | It's possible to be religious even if you're not a member of a religious community. How important is your faith or religion for your well-being and your life satisfaction? | 1 - 4 | |
| | Freq. visit church or religious events | Now some questions about your leisure time. Please indicate how often you take part in each activity: daily, at least once per week, at least once per month, seldom or never? Going to church, attending religious events. | 1 - 5 | |

*Notes:* The table lists the survey questions used to construct the variables for measurement of the absolute convergence among refugees, their classification in categories, the range of possible answers and threshold values for dummy variable construction. Women's rights and System of government questions were only asked for first-time respondents of all survey years. Importance of religion was asked to everyone in 2017 but only first-time-respondents in 2018, and frequency of religious practicing was asked to everyone both in 2017 and 2018.

# Appendix D: Additional Results

## D.1 Far-Right Demonstrations Experienced Early On

In this section, we provide additional evidence that exposure to local threat increases refugees' cultural convergence. Using data from Kanol & Knoesel (2021), for each refugee, we compute the number of far-right demonstrations that occurred in the region of assignment in the first months since arrival. To reduce concerns that the number of demonstrations might be endogenous to refugee inflows, we focus on events happening within a short period of time since the arrival of individual respondents.[85] Another reason why we focus on episodes occurring during the first months since arrival is that refugees' perceptions of local hostility are likely to be shaped by what she experiences early on. This would be consistent with the psychological literature on "synaptic tagging and capture" (Frey & Morris, 1997), according to which strong experiences induce more stable connections between synapses, and are more likely to be remembered (Richter-Levin & Akirav, 2003; Talarico et al., 2004). Demonstrations happening in the first period of stay might also act as "belief twisting events" (Cogley & Sargent, 2008; Friedman & Schwartz, 2008), which might have long-lasting effects on refugees' perceptions and behavior.

In columns 1 to 3 of Table D.1, we regress a refugee's CSI against the number of demonstrations that occurred in the first three months since arrival, holding constant the months spent in Germany (i.e., controlling for MSA). Column 1 reports results for the full sample, while columns 2 and 3 split refugees between those assigned to regions with threat above and below the sample median. Refugees exposed to far-right marches early on are significantly more likely to converge to local culture. This effect is driven by individuals assigned to high-threat regions, where the number of demonstrations is larger than in low-threat regions. Results are similar when considering demonstrations occurring within 6 (columns 4 to 6) and 9 (columns 7 to 9) months since a refugee's arrival.

## D.2 Other Determinants of Refugees' Assimilation

In this section, we consider additional forces that may influence the assimilation trajectories of minorities. This also allows us to address the potential concern that our findings may be partly driven by the spurious correlation between threat and other forces that might independently affect refugees' integration. We present results for cultural and economic convergence

[85] Note that the individual respondent is unlikely to be the "marginal" refugee responsible for the outbreak of the far-right march. However, one may be worried that the respondent arrived during a particularly large refugee wave, which was responsible for the demonstration and independently influenced the assimilation of the respondent through other channels. To address this concern, in unreported results we verified that results are unchanged when controlling for refugee inflows in the year prior to the arrival of the individual respondent.

in Panels A and B of Table D.2 respectively. We report the interaction between MSA and the threat index in column 1, and standardize all variables introduced in subsequent columns, so that the magnitude of coefficients can be consistently compared across mediators.[86]

In column 2, we consider the size of the ethnic enclave, measured as the share of individuals born in the same country of origin of the refugee living in the region as of 2012 (relative to total region population). A large literature has studied the effects of group size on labor market outcomes of minorities, finding mixed results. On the one hand, a larger ethnic enclave can help minorities find a job through ethnic networks (Battisti et al., 2021; Edin et al., 2003). The faster economic integration might, in turn, promote cultural assimilation as well. On the other hand, a larger ethnic enclave might lower incentives to exert effort to learn the language or acquire skills (as well as culture) useful in the host country, slowing down economic or cultural assimilation, or both (Abramitzky et al., 2020b; Advani & Reich, 2015; Eriksson, 2020). The interaction term is positive, but imprecisely estimated for cultural convergence, possibly reflecting the ambiguous predictions just described. When focusing on employment, instead, assimilation is lower where the ethnic enclave is larger.[87]

In column 3, we ask whether cultural and economic convergence vary with the employment rate prevailing among individuals from the same group of countries of origin at baseline.[88] A higher employment rate within one's own network might foster economic integration by providing access to jobs in the region, something that might also speed up cultural convergence. It might also proxy for more favorable economic conditions and a more open (social and economic) local environment. As in column 2, the coefficient on the interaction term is close to zero and imprecisely estimated for cultural convergence. Conversely, it is positive and statistically significant for economic convergence. The lack of cultural convergence, despite economic assimilation, is consistent with two, non-mutually exclusive mechanisms. First, refugees may choose to exert lower effort to adopt local culture if they have easier access to the local labor market. Second, a higher employment rate within a minority community might be indicative of a more open (i.e., less threatening) environment. This may reduce incentives to assimilate culturally. At the same time, the negative effects on incentives just described might be offset by the fact that economic integration promotes cultural assimilation and favors inter-group contact.

In columns 4 and 5, we turn to measures of task diversity and skill complexity.[89] Regions

[86]The number of observations is slightly lower than in Table 1, because we restrict the sample to individuals for which all regional mediators can be included. Mediators are all measured before 2013. Table D.3 presents the definition and source of all variables introduced in this section.

[87]In addition to the mechanisms discussed above, a larger enclave might lower prospects for economic integration by increasing labor market competition for newly arrived individuals. We cannot rule out the possibility that refugees living in larger enclaves enter the labor market through the informal sector (and prefer not to disclose this in the survey).

[88]Due to the small sample size by country of origin, we use group of countries rather than countries (Table D.3).

[89]Task diversity is defined as in Dengler et al. (2014): we first assign the task structure from David & Dorn (2013) to

characterized by higher skill complexity or task diversity may offer more opportunities for refugees, because of labor market complementarities with locals (Peri & Sparber, 2009). For cultural convergence, the predictions are *ex-ante* less clear-cut: while economic integration might favor inter-group interactions and, in turn, foster assimilation, a more diverse economy may be correlated with more open social views among locals. Lower threat may then reduce incentives to exert effort to adopt local culture among refugees. Results indicate that, even though task diversity does not influence the speed of either cultural or economic convergence, skill complexity increases refugees' assimilation along both margins.

Finally, in columns 6 and 7, we ask whether refugees' assimilation depends on the distinctiveness (relative to national culture) and on the degree of heterogeneity of local culture prevailing in the region. For both mediators, predictions are ambiguous. A more distinct local culture may make it easier for refugees to understand the core (local) values, favoring their cultural convergence; yet, higher distinctiveness may be the result of locals' weariness towards outsiders – something that would hinder inter-group interactions. Likewise, a more homogeneous local culture may facilitate refugees' learning; however, it might also reflect locals' reluctance to accept diverse ideas. Perhaps reflecting such ambiguity, coefficients on interactions between MSA and both cultural distinctiveness and cultural dispersion are quantitatively small and not statistically significant.

In column 8, we conclude by conducting a horse-race, including simultaneously interactions between MSA and each of the forces analyzed in isolation thus far. To probe the robustness of our key findings, we also add the interaction between MSA and threat. Starting from cultural convergence, we observe that, once all factors are simultaneously included, the interactions between MSA and network size, network employment, and task diversity all become quantitatively large (and positive) and statistically significant. The other coefficients are similar to those prevailing when analyzing factors in isolation. When considering economic convergence, the horse-race confirms the patterns prevailing in previous columns, except for cultural dispersion, which becomes statistically significant at the 5% level (but remains negative, as in column 7).

Perhaps most importantly for our purposes, the coefficient on the interaction between MSA and threat remains in line with that in column 1. That is, threat increases the pace of cultural convergence, but has no statistically significant effect on economic assimilation. The effect of threat on cultural convergence is sizeable, and close to that of the size of ethnic enclaves or the employment rate of their members. The horse-race reported in column 8 also

each occupation; then, we average across occupations (over task) within each region, and construct a Herfindahl index. Skill complexity is constructed in a similar way: using 5-digit occupation codes (KldB2010 – very similar to ISCO08), we calculate the skill requirement of each occupation. Defining four broad categories (helper; skilled worker; specialist; and, expert), we calculate the share of employees in each of them, relative to all employed individuals in the region. Finally, as before, we calculate a Herfindahl Index. See also Table D.3.

reduces concerns that our findings may be driven by the spurious correlation between the level of hostility prevailing in the region and other forces, although we cannot rule out the possibility that factors other than those considered here may be driving our results.

## D.3 Additional Evidence on Counter-mobilization

As explained in the main text, it is possible that the stronger hostility prevailing in high-threat regions led some locals and non-profit organizations to coordinate efforts to facilitate the cultural integration of refugees. We already documented that no evidence emerges for such hypothesis from survey data (Table 6, columns 4 to 6). We now provide additional, suggestive evidence against pro-refugee activism in regions with higher threat.

In Table D.4, we estimate region-level regressions that include region fixed effects, interactions between year dummies and 2012 regional controls (unemployment rate, population density, and refugee share of the population), the refugee share of the population, and its interaction with the threat index.

In columns 1 and 2, the dependent variable is the number of #refugeeswelcome tweets and the number of #refugeeswelcome tweets per 100,000 residents defined in Appendix C.2.5. Refugee inflows are positively correlated with the frequency of pro-refugee tweets. However, the coefficient on the interaction term is negative and, in column 2, marginally significant, indicating that, if anything, refugee inflows are associated with fewer pro-refugee tweets in regions characterized by a higher threat index. Columns 3 and 4 replicate the analysis by scaling the number of #refugeeswelcome tweets and re-tweets by the number of tweets and the number of users in a region-year, respectively. Also in this case, results are noisy and the coefficient on the interaction term is negative. In Table D.5, we replicate columns 1 to 4 of Table D.4 restricting attention to tweets that are classified as positive according to the approach described in Appendix C.2.5. Also in this case, there is no evidence that refugee inflows lead to more pro-refugee tweets or higher twitter activity. Finally, in columns 5 and 6 of Table D.4, we conduct a placebo check and show that the inflow of refugees is not associated with more (or less) Twitter activity or users in more threatening regions.[90]

We further corroborate this evidence by estimating simple cross-sectional regressions that correlate the number of NGO-led initiatives (column 7) and the number of NGO-led initiatives per 100,000 residents (column 8) in a region with the share of refugees and its interaction with the threat index.[91] The coefficient on the refugee share is negative but not statistically significant for the total number of NGO-led initiatives. The coefficient on

[90] In unreported analysis, we verified that results were similar when considering the overall number of tweets per user.

[91] Regressions also include the uninteracted threat index and control for the 2012 unemployment rate, population density, and refugee share of the population.

the interaction is also negative and, again, imprecisely estimated. In column 8, there is no correlation between the refugee share and the number of NGO-led initiatives per 100,000. However, as for tweets, the coefficient on the interaction term is negative. Moreover, it is also quantitatively large and precisely estimated. Given the cross-sectional nature of this analysis, we interpret results as merely suggestive.

Overall, despite its suggestive nature, the evidence provided in this section does not indicate any pattern of stronger pro-refugee activism among locals living in regions with a higher threat index.[92]

[92] We cannot rule out the possibility that such activism emerged through channels other than those measured here.

Table D.1. Far-right marches in first months of stay and cultural convergence

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | 3 months | | | 6 months | | | 9 months | | |
| | All | High threat | Low threat | All | High threat | Low threat | All | High threat | Low threat |
| | *Cultural similarity index* | | | | | | | | |
| MSA | 0.147*** | 0.271*** | 0.033 | 0.152*** | 0.295*** | 0.008 | 0.151*** | 0.275*** | 0.018 |
| | (0.043) | (0.064) | (0.057) | (0.044) | (0.065) | (0.059) | (0.046) | (0.067) | (0.061) |
| Right-wing demonstrations | 0.913* | 1.278* | 0.578 | 0.577 | 1.352*** | -0.341 | 0.585** | 1.167*** | -0.136 |
| | (0.471) | (0.659) | (0.674) | (0.355) | (0.505) | (0.499) | (0.292) | (0.428) | (0.398) |
| R2 adjusted | 0.394 | 0.399 | 0.391 | 0.394 | 0.400 | 0.391 | 0.395 | 0.399 | 0.393 |
| Dep. var. mean | -1.911 | -1.918 | -1.904 | -1.911 | -1.918 | -1.904 | -1.909 | -1.914 | -1.903 |
| Mean # of demonstrations | 1.492 | 2.041 | 0.918 | 2.660 | 3.553 | 1.725 | 3.807 | 5.015 | 2.554 |
| SD # of demonstrations | 1.542 | 1.644 | 1.181 | 2.579 | 2.764 | 1.978 | 3.609 | 3.886 | 2.792 |
| Person-Year observations | 12,309 | 6,297 | 6,012 | 12,279 | 6,281 | 5,998 | 12,094 | 6,159 | 5,935 |
| Person observations | 6,681 | 3,391 | 3,290 | 6,673 | 3,388 | 3,285 | 6,595 | 3,335 | 3,260 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The dependent variable is the cultural similarity index. Columns 1-3, 4-6, 7-9 gradually increase the number of months since the arrival of the refugee in which we count the number of experienced right-wing extremist demonstrations. Furthermore, we split samples by type of region (in terms of our main threat variable) at baseline. MSA refers to months since arrival. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. All specifications control for the composition of questions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D.2. Cultural and economic assimilation: Horse-race

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | *Panel A. Cultural similarity index (mean: -1.911)* | | | | | | | |
| MSA | 0.116*** | 0.104** | 0.112*** | 0.103** | 0.118*** | 0.108*** | 0.110*** | 0.096** |
| | (0.041) | (0.041) | (0.041) | (0.042) | (0.041) | (0.041) | (0.041) | (0.042) |
| MSA × Threat | 0.075** | | | | | | | 0.113*** |
| | (0.031) | | | | | | | (0.039) |
| MSA × Network size | | 0.055* | | | | | | 0.093*** |
| | | (0.033) | | | | | | (0.034) |
| MSA × Network employment | | | -0.003 | | | | | 0.080** |
| | | | (0.029) | | | | | (0.033) |
| MSA × Task diversity | | | | 0.045 | | | | 0.114*** |
| | | | | (0.028) | | | | (0.033) |
| MSA × Skill complexity | | | | | 0.073*** | | | 0.136*** |
| | | | | | (0.028) | | | (0.035) |
| MSA × Local cultural distinctiveness | | | | | | -0.031 | | -0.044 |
| | | | | | | (0.027) | | (0.027) |
| MSA × Local cultural dispersion | | | | | | | -0.005 | 0.017 |
| | | | | | | | (0.027) | (0.029) |
| R2 adjusted | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.393 | 0.394 |
| | *Panel B. Refugees' relative employment (mean: -0.509)* | | | | | | | |
| MSA | 0.784*** | 0.803*** | 0.775*** | 0.785*** | 0.789*** | 0.784*** | 0.780*** | 0.794*** |
| | (0.043) | (0.043) | (0.043) | (0.043) | (0.043) | (0.043) | (0.043) | (0.043) |
| MSA × Threat | 0.014 | | | | | | | -0.021 |
| | (0.032) | | | | | | | (0.041) |
| MSA × Network size | | -0.126*** | | | | | | -0.104*** |
| | | (0.033) | | | | | | (0.036) |
| MSA × Network employment | | | 0.065** | | | | | 0.085** |
| | | | (0.031) | | | | | (0.036) |
| MSA × Task diversity | | | | -0.017 | | | | 0.021 |
| | | | | (0.030) | | | | (0.037) |
| MSA × Skill complexity | | | | | 0.059* | | | 0.091** |
| | | | | | (0.031) | | | (0.041) |
| MSA × Local cultural distinctiveness | | | | | | 0.022 | | 0.026 |
| | | | | | | (0.028) | | (0.029) |
| MSA × Local cultural dispersion | | | | | | | -0.043 | -0.054* |
| | | | | | | | (0.029) | (0.031) |
| R2 adjusted | 0.177 | 0.179 | 0.178 | 0.177 | 0.178 | 0.177 | 0.178 | 0.180 |
| Person-Year observations | 12,053 | 12,053 | 12,053 | 12,053 | 12,053 | 12,053 | 12,053 | 12,053 |
| Person observations | 6,528 | 6,528 | 6,528 | 6,528 | 6,528 | 6,528 | 6,528 | 6,528 |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Fixed Effects** | | | | | | | | |
| District | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| District controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 6,528 refugees for a total of 12,053 refugee-year observations, restricted to observations for which all mediators are non-missing. The dependent variable is the cultural similarity index (resp. refugees' relative employment) in Panel A (resp. Panel B). MSA refers to months since arrival. Threat is the threat index described in the text. See Table D.3 for the definition of mediators. Threat and mediators are z-standardized within each estimated model. Positive coefficients indicate a reduction in distance to locals. Coefficients and standard errors are multiplied by 100 for presentation. All regressions include dummies for missing control variables, individual characteristics (gender, age, age squared, kids born before arrival in Germany living in the household, country of origin, marital status and location of partner as well as work experience and education upon arrival), district fixed effects, and the interaction of year dummies and district controls (unemployment rate, share of refugees and population density), all measured in December 2012. Panel A always controls for dummies for the composition of questions included in the cultural similarity index. Standard errors, in parentheses, are clustered at the person-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D.3. Description of mediators

| Variable | Definition | Source |
|---|---|---|
| Network size | Share of individuals born in the same country of origin as the refugee living in the region as of 2012, relative to total region population. | German Federal Statistical Office |
| Network employment | Employment rate among individuals from the same region of origin at baseline. We use region instead of country of origin due to small samples in the data. Origin regions include: MENA, Afghanistan, sub-Saharan Africa, West Balkans and former USSR. | Federal Employment Agency (Bundesagentur für Arbeit, 2020) |
| Task diversity | Defined as in Dengler et al. (2014): we first assign the task structure from David & Dorn (2013) to each occupation; then, we average across occupations (over task) within each region, and construct a Herfindahl index. | Federal Employment Agency (Bundesagentur für Arbeit, 2020) |
| Skill complexity | Using 5-digit occupation codes (KldB2010 – very similar to ISCO08), we calculate the skill requirement of each occupation. Defining four broad categories (helper; skilled worker; specialist; and, expert), we calculate the share of employees in each of them, relative to all employed individuals in the region. Finally, as before, we calculate a Herfindahl Index. | Federal Employment Agency (Bundesagentur für Arbeit, 2020) |
| Local cultural distinctiveness | Euclidean distance between the vector of the averages of cultural dimensions over locals and the averages over all Germany. | German Socio-Economic Panel (SOEP) |
| Local cultural dispersion | On local individual, we calculate the mean over all 8 cultural variables of the distance to locals, then take the standard deviation over the NUTS-2 region. | German Socio-Economic Panel (SOEP) |

*Notes:* The table lists the definition and source of the mediators used in the regressions presented in Table D.2.

Table D.4. Locals' counter-mobilization: Twitter and NGO presence

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | All *#refugeeswelcome* tweets and retweets | | | | | | NGO-led initiatives | |
| | Number | Per 100,000 people | Per 100,000 total tweets & retweets | Per 100,000 users | Total number of tweets (in 100,000s) | Number of Twitter users | Number | Per 100,000 people |
| Refugee share | 280.715 | 3.778 | -0.632 | -5894.958 | -1.607 | -127.926 | -5.050 | 0.112 |
| | (299.747) | (6.584) | (7.455) | (16793.883) | (1.547) | (116.488) | (7.746) | (0.325) |
| Refugee share × Threat | -18.984 | -3.059* | -2.400* | -4827.923 | -0.344 | -29.308 | -2.359 | -0.291** |
| | (34.914) | (1.715) | (1.418) | (2977.417) | (0.309) | (22.669) | (2.317) | (0.125) |
| R2 adjusted | 0.933 | 0.916 | 0.887 | 0.903 | 0.996 | 0.997 | 0.730 | 0.687 |
| Dep. var. mean | 674.456 | 28.813 | 31.062 | 69524.505 | 18.945 | 876.022 | 14.974 | 0.679 |
| NUTS-2-Year observations | 228 | 228 | 228 | 228 | 228 | 228 | | |
| NUTS-2 observations | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| **Fixed Effects** | | | | | | | | |
| NUTS-2 | Yes | Yes | Yes | Yes | Yes | Yes | No | No |
| NUTS-2 controls × survey year | Yes | Yes | Yes | Yes | Yes | Yes | No | No |

*Notes:* The sample consists of i) 228 NUTS-2-year observations for years 2013 to 2018 (columns 1-6), and ii) 38 NUTS-2 observations (columns 7 and 8). Column 1 (resp. column 2) presents the number of tweets and retweets in German (resp. per 100,000 people) posted that year by users located in the NUTS-2 region and containing the hashtag *#refugeeswelcome*. Column 3 (resp. column 4) presents the number of tweets and retweets containing *#refugeeswelcome* per 100,000 of all tweets and retweets (resp. per 100,000 users in the region) that year in a NUTS-2 region. Column 5 (resp. column 6) presents the total number of all tweets in 100,000s (resp. a proxy for distinct users) that year in a NUTS-2 region. Column 7 (resp. column 8) presents the number of NGOs assisting refugees (resp. per 100,000 people). The construction of these variables is detailed in Appendix C.2. Refugee share refers to the percent of refugees at the district-level measured on December 31 of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized within each model. Columns 1 to 6 include NUTS-2 fixed effects, and the interaction of survey year dummies and NUTS-2 controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, clustered at the NUTS-2 region-level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D.5. Locals' counter-mobilization: Positive tweets only

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Positive *#refugeeswelcome* tweets and retweets | | | |
| | Number | Per 100,000 people | Per 100,000 total tweets & retweets | Per 100,000 users |
| Refugee share | 35.375 | 0.571 | 0.039 | -231.444 |
| | (33.931) | (0.666) | (0.720) | (1,600.058) |
| Refugee share × Threat | 0.837 | -0.162 | -0.121 | -195.075 |
| | (3.910) | (0.134) | (0.114) | (219.517) |
| R2 adjusted | 0.920 | 0.921 | 0.888 | 0.904 |
| Dep. var. mean | 55.737 | 2.363 | 2.501 | 5,639.754 |
| NUTS-2-Year observations | 228 | 228 | 228 | 228 |
| NUTS-2 observations | 38 | 38 | 38 | 38 |
| **Fixed Effects** | | | | |
| NUTS-2 | Yes | Yes | Yes | Yes |
| NUTS-2 controls × survey year | Yes | Yes | Yes | Yes |

*Notes:* The sample consists of 228 NUTS-2-year observations for years 2013 to 2018. Column 1 (resp. column 2) presents the number of tweets and retweets in German (resp. per 100,000 people) posted that year by users located in the NUTS-2 region and containing the hashtag *#refugeeswelcome*. Column 3 (resp. column 4) presents the number of tweets and retweets containing *#refugeeswelcome* per 100,000 of all tweets and retweets (resp. per 100,000 users in the region) that year in a NUTS-2 region. Refugee share refers to the percent of refugees at the district-level measured on December 31 of the year prior to the interview. Threat is the threat index described in the text, and is z-standardized within each model. Columns 1 to 4 include NUTS-2 fixed effects, and the interaction of survey year dummies and NUTS-2 controls (unemployment rate, share of refugees, and population density), all measured in December 2012. Standard errors, in parentheses, clustered at the NUTS-2 region-level. $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$.