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Does the Education Level of Refugees Affect Natives' Attitudes?

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Does the Education Level of Refugees Affect Natives' Attitudes?*

Abstract

In recent years, Europe has experienced a large influx of refugees. While natives' attitudes toward refugees are decisive for the political feasibility of asylum policies, little is known about how these attitudes are shaped by information about refugees' characteristics. We conducted a survey experiment with a representative sample of more than 4,000 adults in Germany in which we randomly provide information about refugees' education level. Information provision strongly increases respondents' beliefs that refugees are well educated. The information also increases labor market competition concerns, decreases fiscal burden concerns, and positively affects general attitudes toward refugees. We perform several robustness analyses in additional experiments with more than 5,000 university students. In sum, we show that correcting misperceptions about refugees' education level has profound effects on natives' attitudes.

JEL Code: F22, J24, D83, C91

Keywords: Refugees, information provision, education, survey experiment, labor market

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1. Introduction

In 2014 and 2015, Europe experienced a large influx of refugees. In 2015 alone, more than 1.5 million individuals applied for asylum in Europe, with Germany registering the highest number of some 440,000 applications (Eurostat 2016).¹ These refugee movements were exceptional not only in terms of magnitude, but also in terms of refugees' origin countries: As Syria, Afghanistan, and Iraq constitute the main source countries, these refugees are perceived as culturally more distinct than those seeking asylum during previous refugee waves, such as refugees from the Balkan countries in the 1990s (see Dustmann et al. 2017). Against this background, European politicians face a challenge when implementing and enforcing asylum policies. On the one hand, these policies have to comply with international commitments, such as the 1951 Geneva Convention for Refugees or the Dublin Convention; on the other hand, they have to be supported by domestic voters to be implemented successfully (given that politicians face re-election incentives). The fact that public support for anti-immigration parties increased markedly in several European countries during the refugee crisis suggests that voters' skepticism toward refugees and national asylum policies has not been fully appreciated by governing politicians.² Despite the policy relevance of studying public attitudes toward refugees (e.g., in the context of median-voter theorems), little is known about the determinants of these attitudes and whether they depend on information about the characteristics of refugees.

In this paper, we study whether attitudes toward refugees are affected by beliefs about refugees' education level. To do so, we implemented an online survey experiment with more than 4,000 respondents who are representative of the adult population in Germany. To estimate a causal effect of education beliefs on attitudes, we exogenously shifted respondents' beliefs by randomly providing information on refugees' education level. The focus on refugees' education level, one specific characteristic of refugees, is motivated by the fact that immigrants' skill level has been theorized to be a key determinant of natives' attitudes toward them (Hainmueller and Hiscox 2010). In particular, the *labor market competition model* predicts that natives will be most opposed to immigrants whose skills are similar to their own since these immigrants might be competitors on the labor market (see also Haaland and Roth 2017). The *fiscal burden model*, on the other hand, predicts that natives in general (both high- and low-skilled) are more opposed to low-skilled immigrants because they impose larger

¹ Throughout the paper, we use the term “refugee” as a collective term for all persons who seek refuge in another country, independent of their legal status. We thereby follow the public discourse in Germany, in which the migration inflow from 2014 onward has generally been referred to as “Flüchtlingskrise” (refugee crisis) by politicians, the media, and the general public. The Federal Ministry of Internal Affairs registered a total of more than 1.1 million refugees entering Germany in 2015 (Bundesministerium des Inneren 2016). As a comparison, Europe received a total of 850,000 asylum application in the previous peak year of 1992 (Dustmann et al. 2017).

² Electoral outcomes that have largely been attributed to voters' rising anti-immigration sentiments include the “Brexit” referendum in the United Kingdom (Bansak, Hainmueller, and Hangartner 2016) and the success of the right-wing populist party “Alternative für Deutschland” (AfD) in Germany. The AfD won significant vote shares in several state elections, including the 2016 state election in Mecklenburg-West Pomerania in which it outperformed Chancellor Merkel's “Christlich Demokratische Union” (CDU) in Merkel's home state (21% versus 19%). In the German federal election in September 2017, the AfD received 13% of the votes, rendering it the third-largest party in the German Bundestag.

fiscal burdens on the public than high-skilled immigrants. Apart from these hypothesized relationships between immigrants' skills and natives' attitudes, our focus on refugees' education level (rather than other refugee characteristics) has been shaped by the political and public debates on refugee integration, since education plays a central role in any debate about integrating refugees into the labor market or educational system.³

Motivated by the notion that citizens are often ill-informed about fundamental economic and societal facts (e.g., Kuklinski et al. 2000), our experiment focuses on how providing factual information about the education level of refugees affects natives' attitudes. In particular, we informed a randomly selected treatment group about the average educational attainment of refugees in Germany *before* measuring (i) beliefs about refugees' education level, (ii) labor market competition concerns, (iii) fiscal burden concerns, and (iv) general attitudes toward refugees. To delve into the mechanisms of potential treatment effects, we additionally elicited the importance of different aspects that shape respondents' attitudes toward refugees as well as perceptions about whether refugees are able to transfer their skills to the German labor market.

We find that providing the information about refugees' education level strongly increases the share of respondents who think that refugees are well educated by 18 percent points (control-group mean: 18%). This suggests that citizens on average severely underestimate the education level of refugees. Furthermore, the information treatment *increases* concerns about labor market competition and *decreases* concerns about the fiscal burden. Given the counteracting effects on labor market competition concerns and fiscal burden concerns, it is *a priori* unclear how the information provision affects respondents' general attitudes toward refugees. It turns out that the information treatment significantly *improves* general attitudes, suggesting that decreased fiscal burden concerns on average more than outweigh increased labor market competition concerns. Interestingly, the general pattern of results is very similar for non-tertiary-educated and tertiary-educated respondents. In additional analyses, we investigate the relative importance of economic versus non-economic aspects in shaping attitudes toward refugees, finding that several non-economic factors (e.g., refugees' willingness to integrate or humanitarian aspects) are more important for respondents than economic considerations.⁴ Further analyses suggest that the information treatment might partially operate through respondents' beliefs how well refugees can transfer their skills to the German labor market.

³ Refugees primarily migrate because of events that might pose a risk to their lives and not for economic reasons (see Dustmann et al. 2017 for a discussion of the differing motives of refugees and economic migrants). At the same time, refugees often stay in the host countries for longer periods, making labor market integration an important challenge. Since labor market integration is considered an important step for the general integration into the host country, refugees in Germany are entitled to work immediately once their asylum has been granted. Since many individuals applied for asylum in Germany, this implies a considerable number of refugees entering the labor market. In June 2017, for example, 10% of all unemployed persons seeking work in Germany were refugees (Degler, Liebig, and Senner 2017).

⁴ This result is consistent with the existing literature on attitude formation toward immigrants, which suggests that non-economic aspects are more important than economic aspects (e.g., Card, Dustmann, and Preston 2012; Dustmann and Preston 2007; Hainmueller and Hiscox 2010).

We present additional experiments conducted with more than 5,000 university students to investigate the robustness of our results from the representative sample. Information treatment effects on respondents' beliefs that refugees are well educated (i) persist until one week after information provision and (ii) are robust to using an alternative information treatment. Furthermore, we use the item count technique (ICT) – an experimental survey technique to measure social-desirability bias – to show that survey answers are hardly biased by respondents' desire to provide socially desirable answers. Finally, we provide a descriptive comparison between our representative adult sample and the university-student sample and find that university students are in general more optimistic (with respect to refugees' education level, concerns regarding labor market competition and fiscal burden, and general attitudes), and react less strongly to the information treatment.

Our paper contributes to several strands of economic research. It is related to the literature on attitudes toward immigration (e.g., Card, Dustmann, and Preston 2012; Dustmann and Preston 2007; Facchini and Mayda 2008; O'Rourke and Sinnott 2006), in particular to those studies that use survey experiments. For example, Grigorieff, Roth and Ubfal (2020) show that randomly provided information about immigration, such as the share of immigrants in the population and immigrants' unemployment or incarceration rates, yields more favorable attitudes toward immigrants, but does not affect policy preferences. Using a similar design, Alesina, Miano, and Stantcheva (2018) study how information about the true share, the origin, and the work ethic of immigrants affects natives' distributional preferences. They find that this information reduces the demand for redistribution. Hainmueller and Hiscox (2010) study experimentally how concerns about labor market competition and about the fiscal burden on public services shape attitudes toward high- and low-skilled migration. They find no support for the labor market competition model or the fiscal burden model in their data. Haaland and Roth (2017) investigate whether beliefs about labor market impacts of immigration affect support for immigration. They find that respondents report more support for immigration when being provided research-based evidence that immigration has no adverse effects on natives' wages. To our knowledge, ours is the first paper that studies how providing education information affects natives' concerns and attitudes toward refugees in the context of the European refugee crisis.

While the literature on natives' attitudes toward immigration is well developed, evidence on what determines attitudes toward refugees is scarce. We consider it very difficult to use existing research results on attitudes toward immigration for drawing conclusions about the European refugee crisis for at least three reasons. First, economic migrants and refugees are differently selected (voluntary versus forced migration). Consequently, they differ in key characteristics such as age, gender, education, and employment probabilities (see Dustmann et al. 2017 for evidence from past refugee waves in Europe, and Cortes 2004 for evidence from the U.S.). Second, host countries have fundamentally different motives for granting refugee status versus permitting economic migration (humanitarian versus economic motives), which makes it likely that natives' attitudes also differ across these migrant groups. Third, most surveys cited above were conducted before the massive refugee influx in 2014/2015. Given

that the European refugee crisis was exceptional in several dimensions, we doubt that previous evidence from natives who have not experienced the recent refugee crisis serves as a good proxy for how individuals form their attitudes in the context of the European refugee crisis. The study most closely related to ours is the survey experiment by Bansak, Hainmueller, and Hangartner (2016). The authors asked 18,000 eligible voters in 15 European countries to evaluate different profiles of refugees that varied experimentally across nine broad domains. They find that refugees are more likely to be accepted if they worked in higher-skilled occupations in their home country, have more consistent asylum testimonies and higher vulnerability, and are Christians (rather than Muslims). In a related survey experiment, Bansak, Hainmueller, and Hangartner (2017) show that European citizens support a proportional allocation of asylum seekers across countries.⁵ We add to this literature by providing an in-depth analysis of the causal effect of providing factual information about refugees' education level on natives' attitudes. More generally, our paper contributes to the growing literature that studies the causal effects of information provision on survey respondents' attitudes and preferences in various domains⁶ and to the literature that investigates the effects of factual and fake information, and fact-checking, on voters' preferences (see, for instance, Barrera et al. (2020) for evidence that right-wing politicians' lies about refugee-related facts affected voters' preferences in France).

Finally, our paper compares findings from a nationally representative sample with a large university-student sample. Thus, we extend the literature in experimental economics that compares students to non-student subjects (e.g., Carpenter, Connolly, and Myers 2008; Anderson et al. 2013; Falk, Meier, and Zehnder 2013; Belot, Duch, and Miller 2015; Cappelen et al. 2015) to the domain of beliefs, concerns, and attitudes toward refugees. Furthermore, our data enables a comparison of information treatment effects across both subject pools.

Our findings have two key policy implications: First, correcting misperceptions about refugees through information provision can improve attitudes toward refugees, thereby fostering the political feasibility of asylum policies. Second, non-economic aspects are very important for shaping the general public's attitudes toward refugees, which indicates that policy makers may increase public acceptance of refugees by highlighting humanitarian aspects or their willingness to integrate.

The rest of the paper is structured as follows. In Section 2, we describe the labor market competition model and the fiscal burden model. We discuss the challenges of measuring refugees' education level and present the studies that we used to design the information treatments. In Section 3, we describe the opinion surveys, the experimental design, and the econometric model. In Section 4, we present our main experimental results on the representative adult sample, along with the robustness experiments with

⁵ Further recent studies on natives' attitudes in the context of the European refugee crisis include Dustmann, Vasiljeva, and Damm (2019) and Steinmayr (2020), who investigate how the exposure to refugees affects voting behavior in Denmark and Austria, respectively. Furthermore, Jeworrek, Leisen, and Mertins (2019) study whether informing survey participants about the possibility that refugees support the local population with volunteering activities affects natives' support for integrating refugees.

⁶ See, for instance, Alesina, Stantcheva, and Teso 2018, Bursztyn 2016, Cruces, Perez-Truglia, and Tetaz 2013, Karadja, Mollerstrom, and Seim 2017, Kuziemko et al. 2015, Lergetporer et al. 2018, Lergetporer, Werner, and Woessmann 2020, Wiswall and Zafar 2015.

university students. Section 5 discusses our findings and concludes.

2. Theoretical framework and evidence on refugees' education level

While refugees typically do not intend to stay permanently, their integration in the host country is nevertheless an important issue since many refugees have only few prospects of returning to their country in the near future (Woessmann 2016). The success of refugees' integration critically depends on their successful integration into the labor market (Degler, Liebig, and Senner 2017), which is also economically desirable since working refugees typically do not depend on government aid. For these reasons, refugees in Germany are allowed to work once asylum has been granted. In general, policy makers may be more likely to implement successful integration policies when they possess accurate information on the skill level of refugees and when natives have positive attitudes toward refugees.

Economic theories on natives' attitudes toward immigrants

The increasing success of anti-immigration parties in Europe, including the AfD in Germany, during recent years suggests widespread hostile attitudes toward immigration and/or refugees. Thus, natives' attitudes toward immigration might be a key obstacle to the implementation of integration policies as well as for accepting new immigrants and refugees. As a conceptual framework for our empirical analysis, we briefly describe economic theories that link natives' attitudes to migrants' education level.

Economic models on attitudes toward immigration emphasize the importance of migrants' education level and natives' beliefs thereof. Hainmueller and Hiscox (2010) discuss two competing theories on how the skill level of immigrants affects natives' attitudes toward them. According to the *labor market competition model*, natives are most opposed to immigrants with a skill level similar to their own because they expect these immigrants to compete for the same types of jobs (e.g., Mayda 2006; Scheve and Slaughter 2001). For high-skilled natives,⁷ the labor market competition model predicts more *negative* attitudes toward refugees when they believe that refugees are highly educated (and thus potential competitors on the labor market). In contrast, the *fiscal burden model* predicts more opposition to low-skilled immigration – among both low- and high-skilled natives – because low-skilled immigrants (by assumption) impose net burdens on public finance whereas high-skilled immigrants are net contributors. For low-skilled natives, both models thus predict more opposition to low-skilled immigration.

In this study, we test whether shifting respondents' beliefs about refugees' education level affects (i) concerns about competition on the labor market (*hypothesis 1*); (ii) concerns that refugees impose fiscal burdens on public services (*hypothesis 2*); and (iii) general attitudes toward refugees (*hypothesis*

⁷ Using data from the German Socio-Economic Panel (SOEP) from 2014, Brücker, Rother, and Schupp (2016) report that 21% of the German population holds a university degree (this share is similar to the 25% share in our representative sample from 2019; see Section 3.2). Note that the share of university-educated adults is lower in Germany compared to other OECD countries because of the extensive dual vocational education system in Germany.

3). Note that a necessary condition for testing the predictions of the models is that the information provision shifts concerns about labor-market competition and fiscal burden. Put differently, if our data does not confirm hypothesis 1 (hypothesis 2), this does not necessarily discard the *labor market competition model* (*fiscal burden model*).⁸

The education level of refugees in Germany

The successful integration of refugees into the labor market of the host country may substantially depend on their skills. A major challenge in this context is the large degree of uncertainty regarding refugees' formal education. The large inflow of refugees during the years 2014 and 2015 posed an enormous administrative challenge to register arriving refugees and an even larger challenge to document their educational degrees. Particular problems arise due to missing verifiable credentials, such as graduation certificates, and because educational degrees from the refugees' home countries are often hardly comparable with German educational degrees (see Brücker, Rother, and Schupp 2016, Woessmann 2016).

As a consequence of these difficulties, studies that aimed at quantifying the education or skill level of refugees at the beginning of the refugee crisis have produced seemingly contradictory findings. For instance, the UNHCR study on Syrian refugees (UNHCR 2015) drew a positive picture of refugees' education level since it finds that 43% of adult Syrian refugees report to have some university education and an additional 43% report to have completed secondary education.⁹ In contrast to the UNHCR study, Woessmann's (2016) analysis of multiple data sources (including the German Microcensus and the IAB-SOEP Migration Sample) yielded a more negative picture of refugees' education level. For instance, using data from the Trends in International Mathematics and Science Study (TIMSS) in 2011 (before the Syrian civil war started), he finds that 65% of Syrian 8th-grade students fail to achieve the most basic proficiency level in mathematics and in science.

More recent and direct evidence on the education level of refugees in Germany stems from the *IAB-BAMF-SOEP Survey of Refugees in Germany* that was released in late 2016. This study finds that 32% of asylum seekers in Germany aged 18 years and older have a high school degree and 13% hold a university degree (see Brücker, Rother, and Schupp 2016). In our main survey experiment, we provide respondents with information on refugees' education from this study (see Section 3.2 for details). Given the uncertainty surrounding the true education level of refugees, we use alternative information

⁸ While we consider our focus on information about refugees' education level particularly relevant in the context of the European refugee crisis, an alternative research design to directly test the validity of both models would be to provide direct information on the effects of the refugee influx on the labor market and government finance, respectively. For instance, Haaland and Roth (2017) provide direct information about the labor market impacts of immigration in the U.S. We consider the application of such a design to the European refugee crisis an interesting avenue for future research.

⁹ These data were collected by UNHCR border protection teams who conducted interviews among a non-random sample of Syrian asylum seekers in various locations in Greece. The authors of the study highlight that the interviews were voluntary and interviewees were *not* required to verify their education statements with credentials.

treatments based on the studies by UNHCR (2015) and Woessmann (2016) in one of our robustness experiments with university students (see Section 3.3).

3. Data, experimental setup, and empirical model

Our main empirical analysis is based on the 2019 wave of the ifo Education Survey, an annual opinion survey on education policy. The survey was fielded in May 2019 and covers a total of 4,009 respondents who are representative for the adult population (18 years and older) in Germany. The sample was drawn in order to represent the adult population with respect to the distribution by gender, age, education, and region. Respondents complete the survey online on their own digital device. The survey contains a total of 36 questions on different education topics and collects respondents' socio-demographic characteristics at the end of the questionnaire (see Woessmann et al. 2019 for more details). All respondents provided answers to our outcome-questions of interest (i.e., we have no item non-response).

3.1 Survey questions

We designed the survey questions to measure respondents' (i) beliefs about refugees' education level, (ii) labor market competition concerns, (iii) fiscal burden concerns, (iv) general attitudes toward refugees, (v) aspects that shape respondents' attitude toward refugees, and (vi) belief that refugees can apply their skills to the German labor market. Appendix Table A1 contains the wording and response categories of all questions (translated into English).¹⁰

Beliefs about refugees' education level. To assess whether the information treatment (described below) indeed shifts beliefs about refugees' education level, we asked respondents to indicate their belief about refugees' education level *after* randomly providing the information on refugees' education level. Treatment effects on these beliefs reveal the extent to which respondents update their beliefs when provided with information.

Labor market competition concerns and fiscal burden concerns. To assess whether information provision affects labor market competition concerns, we elicited respondents' concerns that refugees increase labor market competition "for me personally" and "in general". To assess effects on fiscal burden concerns, we measured concerns about (i) fiscal revenues and costs, (ii) the need for tax increases, and (iii) lower levels of government benefits due to spending on refugees.

General attitudes toward refugees. Ultimately, we are interested in how natives' beliefs about the education level of refugees translate into general attitudes toward them. To measure general attitudes,

¹⁰ Like many other recent economics papers using survey experiments, our outcomes of interest are self-reported attitudes and policy preferences (e.g., Alesina, Stantcheva, and Teso 2018, Karadja, Mollerstrom, and Seim 2017, Kuziemko et al. 2015). Importantly, recent survey experiments have established the relevance of self-reported attitudes toward migration by showing that they correspond closely to actual political behavior, such as the probability of signing an online petition or donating to charity (e.g., Grigorieff, Roth and Ubfal 2016, Haaland and Roth 2017, Alesina, Miano, and Stantcheva 2018).

we asked respondents whether (i) the number of refugees that Germany admitted in 2015 was too high or too low, and (ii) whether refugees should be allowed to stay in Germany permanently.

Aspects shaping respondents' attitudes. Furthermore, we asked respondents about the importance of six different aspects for forming their attitudes toward refugees: humanitarian aspects, economic aspects, refugees' willingness to integrate, religion/culture of refugees, refugees' criminal behavior, and personal experience with refugees. Comparing the relative importance of the various aspects helps understanding potential channels through which education beliefs affect general attitudes.

Perceived skill transferability. Since refugees acquired their educational degrees in education systems that differ markedly from the German one, we asked respondents whether they believe that refugees can successfully apply their skills to the German labor market. This allows us to study perceived skill transferability as another potential channel through which potential treatment effects may operate.

Summary indices. We combine answers to individual questions to create three summary indices: one summary index for general attitudes, one for labor market competition concerns, and one for fiscal burden concerns.¹¹ In our analysis, we report treatment effects on the summary indices as well as on their respective components. The advantage of using summary indices is their robustness to overtesting because only few indices are used, and that measurement error is reduced if measurement error is not perfectly correlated across individual items (see Anderson 2008).

3.2 Information treatment and balancing test

To identify a causal effect of beliefs about refugees' education level on attitudes toward them, we randomly assigned respondents to one of two experimental groups (control group or treatment *Information*) that differed by whether information on refugees' education level was provided before answering the questions described above.

Control group. Respondents in the control group were shown the following text before answering the survey questions on refugees: “Now we would like to learn about your opinion on refugees. Please think of the refugee situation in Germany since 2015 when answering the questions.” Note that this text does not contain any information about refugees' education level.

Treatment Information. Respondents in treatment *Information* were given the following information: “Now we would like to learn about your opinion on refugees. Please think of the refugee situation in Germany since 2015 when answering the questions. In this context, a study has found that 32% of adult refugees have a high school degree; the respective share among the German population is 29%. 13% of refugees hold a university degree; the respective share among the German population is 21%.” The information on refugees' education level was based on the *IAB-BAMF-SOEP Survey of*

¹¹ Each index is computed in three steps. First, we demean the responses to the individual questions (concerns are coded from 1=“completely disagree” to 5=“completely agree”; general attitudes are coded from 1=“very negative attitude” to 5=“very positive attitude”). Second, we standardize the demeaned outcomes of all individual questions by dividing it by its standard deviation. Third, we compute the mean across the standardized items that enter a specific summary index.

Refugees in Germany (see Section 2 for details). We supplemented this text with a graphical depiction of this information, using bar charts (see Appendix Figure A1).

Appendix Figure A2 depicts the experimental design in detail. In a first step, respondents were randomized with equal probability into the control group and treatment *Information*. After the randomized information provision, we elicited respondents' beliefs about refugees' education level, both labor market concerns, one fiscal burden concern (concerns about fiscal revenues and costs), and one general attitude (whether refugees should be allowed to stay in Germany permanently). Since the space for questions in the ifo Education Survey was limited, we then implemented a second, independent randomization which assigned respondents either to further questions on concerns and attitudes (concerns about lower government benefits and tax increases, whether the number of refugees that Germany admitted since 2015 was too high, and whether refugees can apply their skills on the German labor market) or questions on the importance of the six aspects of opinion formation. Note that the goal of this second randomization was not to compare answers across different groups, but to elicit several different outcome questions given the limited space in the survey. Importantly, both randomizations were independent, which enables us to estimate unbiased effects of treatment *Information* on the concerns and attitudes that were elicited after the second randomization. Since we are mostly interested in the ranking of the different opinion-formation aspects, we decided to assign only one quarter of respondents to these questions.

To test whether the randomization balanced the socio-demographic characteristics of respondents across experimental groups, we compare the characteristics of respondents in the control group with respondents in treatment *Information* (Table 1). We find that only one out of 25 respondent characteristics differs marginally significantly across experimental groups, which shows that randomization worked as intended. Note that 10% of respondents have no vocational degree, 65% hold a vocational degree, and 25% hold a tertiary degree. For the subsequent analysis, we refer to the latter group as *tertiary educated* and to the former two groups as *non-tertiary educated*. We show all results for the overall sample and for these two groups separately.

3.3 Additional robustness experiments in student samples

In addition to our main survey experiment conducted in the representative sample of the German adult population, we present two robustness experiments that we implemented among more than 5,000 university students. We use these additional experiments to show that (i) treatment effects persist over a period of one week, (ii) survey answers on refugees are largely unaffected by social desirability bias, and (iii) treatment effects are robust to using an alternative information treatment. Here, we only present the main results from these robustness experiments. For an in-depth analysis of the experiments with university students, see Lergetporer, Piopiunik, and Simon (2017).

The first robustness experiment was conducted with a set of 582 university students. We used the same information treatment as in the main survey with the representative sample. We invited all respondents to participate in a re-survey about one week later, which again elicited respondents' beliefs

about refugees’ education level (but did not include any information about refugees’ education level). Out of the 582 respondents in the first survey, 292 (50%) participated in the re-survey one week later.¹² We use this design to assess whether the information treatment induces a persistent shift in respondents’ beliefs about refugees’ education level. In the same sample, we used the item count technique (ICT) to assess the extent of social desirability bias in the questions on labor market competition and fiscal burden concerns as well as aspects of attitude formation (see Coffman, Coffman, and Ericson 2017). The ICT provides a “veil” of anonymity for sensitive questions that reduces the risk of biases through socially desirable answers. Appendix B provides a detailed description of the item count technique.

The second robustness experiment was conducted with a different sample of 4,901 university students and featured alternative factual information treatments. In particular, respondents were randomized into three different experimental groups. Again, the control group did not receive any information about refugees’ education level before answering the main outcome questions. Respondents in treatment *High Skilled* were given the following information based on the UNHCR (2015) study (see Section 2): “*With this survey, we would like to learn about your opinion on refugees. Please think of the current refugee situation in Germany when answering the survey. In this context, a study has found that the education level of refugees is rather high since 43% of the refugees from Syria have attended a university.*” Participants in treatment *Low Skilled* were given the following information based on Woessmann (2016): “*With this survey, we would like to learn about your opinion on refugees. Please think of the current refugee situation in Germany when answering the survey. In this context, a study has found that the education level of refugees is rather low because 65% of the school students in Syria do not reach the basic level of academic competencies.*” Note that these information treatments do not involve deception, since they are both based on actual, yet contradicting, scientific findings. This robustness experiment allows us to assess the extent to which our main results are driven by the specific information that respondents are provided.

3.4 Empirical model

We use the following reduced-form model to estimate the intention-to-treat (ITT) effect of our information treatment:

$$y_i = \beta_0 + \beta_1 \text{Information}_i + \delta' X_i + \varepsilon_i. \quad (1)$$

where y_i is the outcome of interest for individual i (e.g., education beliefs, concerns, attitudes), *Information* is a binary information treatment indicator, X_i is a vector of control variables that contain respondents’ socio-demographic characteristics (e.g., gender and age), and ε_i is the idiosyncratic error term. The average treatment effect, β_1 , is consistently estimated because of the random assignment of

¹² This participation rate is roughly comparable to other recent studies: For instance, take-up in the follow-up surveys was 14% in Kuziemko et al. (2015), 24% in Alesina, Stantcheva, and Teso (2018), and 66% in Haaland and Roth (2017).

the information treatment status. Therefore, adding control variables should not significantly change the treatment-effect estimates, though they might increase precision. We present estimation results with and without the covariates X_i .

4. Experimental results

4.1 Treatment effects on beliefs about refugees' education level

Table 2 shows that treatment *Information* strongly changes respondents' beliefs about refugees' education level. The dependent variable in columns 1 and 2 equals 1 if the respondent *agrees* somewhat or completely that refugees are well educated on average, and equals 0 otherwise; in columns 3 and 4, the dependent variable equals 1 if the respondent *disagrees* somewhat or completely (0 otherwise). In columns 5 and 6, the dependent variable is the original outcome at the five-point scale, with higher values indicating more agreement to the statement that refugees are well educated on average. Odd-numbered columns show the results of regressions without covariates, while even-numbered columns include the covariates presented in Table 1.

In the full sample (panel A), the information provision increases the share of respondents who agree that refugees are well educated by 18 percentage points (baseline: 18%) and decreases the share of those who disagree by 17 percentage points (baseline: 65%). Panels B and C show these effects separately for tertiary-educated respondents and non-tertiary-educated respondents. Interestingly, both baseline responses and information-treatment effects are very similar across both groups: Treatment *Information* increases agreement that refugees are well educated by 18 percentage points in both groups (baselines: 19% and 17%, respectively).

In sum, we find that respondents substantially revise their assessment of refugees' education level upwards when receiving factual information about refugees' education level. This suggests that respondents underestimate refugees' education level. Next, we investigate how treatment *Information* affects respondents' labor market competition concerns, fiscal burden concerns, and general attitudes.

4.2 Treatment effects on concerns and general attitudes

Labor market concerns and fiscal burden concerns

Table 3 reports the causal impact of providing information about refugees' education level on respondents' labor market competition and fiscal burden concerns. The dependent variables in columns 1 and 4 are the summary indices of labor market competition and fiscal burden concerns, respectively (see Section 3.1 for information on the construction of these indices). The outcomes in the remaining columns are binary indicators of agreement (=1 if "completely agree" or "somewhat agree") with the individual statements that make up the two summary indices.

In the overall sample, the treatment significantly increases respondents' concerns about increased labor market competition (column 1 of panel A). This effect is driven by both a significant increase of 4 percentage points in concerns about competition for the respondent personally (column 2) and a

somewhat larger effect of about 6 percentage points on concerns about increased competition on the labor market in general (column 3). The difference might indicate that respondents are somewhat reluctant to refer increased labor-market competition concerns to themselves, though these two treatment effects are not statistically significantly different ($p=0.21$). Interestingly, treatment effects are similar in magnitude for tertiary-educated and non-tertiary-educated respondents (panels B and C). Again, treatment effects are somewhat larger for labor-market competition “in general” in both subgroups.

The information treatment significantly decreases the fiscal burden concerns index, indicating *less* concerns (column 4 of Table 3). This effect is entirely driven by a positive treatment effect of 7 percentage points on the agreement to the statement that refugees bring more revenues than costs (column 5). Treatment effects on concerns about tax increases and lower levels of government benefits are small and statistically insignificant (columns 6 and 7). Again, treatment effects are very similar for tertiary-educated and non-tertiary-educated respondents (panels B and C). Note that the treatment effect on the index is similar in magnitude for both groups, but is statistically significant only for non-tertiary-educated respondents, whose sample is substantially larger.

General attitudes

Since information provision *increases* labor market competition concerns, but *decreases* fiscal burden concerns, the theoretical predictions of how information provision affects general attitudes are inconclusive. According to the *labor market competition model*, the treatment *Information* should have a negative effect on general attitudes; in contrast, the *fiscal burden model* predicts a positive effect. Table 4 answers this question empirically by presenting the effects of treatment *Information* on general attitudes. Overall, the information treatment significantly improves general attitudes (column 1). This positive impact is driven by a significant increase in the share of respondents who agree to the statement that refugees should be allowed to stay in Germany permanently (column 3). Interpreted at face value, this result suggests that the *fiscal burden model* yields a more accurate prediction on how shifting respondents’ education beliefs upwards affects general attitudes. However, note that these results do not render the *labor market competition model* irrelevant per se because the experimentally induced increase in labor market competition concerns might simply be too weak to change general attitudes (see the discussion on the testability of the theoretical models in Section 2). Panels B and C of Table 4 show that treatment effects are similar for respondents with different education levels, though treatment effects are smaller and only marginally significant for tertiary-educated respondents.

Heterogeneity analysis

Finally, we investigate whether treatment *Information* has heterogeneous effects on different subgroups of the population. To this end, we regress our main outcome variables of interest on the information treatment indicator, an indicator for the respective subgroup, and the interaction of the two indicators (see Table 5).

We start our heterogeneity analysis with a particularly relevant subgroup of the population: Supporters of the AfD, the right-wing, anti-immigration party that won significant vote shares during the European refugee crisis.¹³ Panel A shows that AfD supporters' beliefs about refugees' education level are largely unaffected by information provision (column 1). At the same time, the information treatment increases their labor market concerns more strongly than among non-AfD supporters (column 2), strongly increases their fiscal-burden concerns (column 3), and strongly decreases their general attitudes (column 4), which are much lower than those of non-AfD supporters already at baseline. In sum, right-wing respondents' beliefs about refugees' education level are much less receptive to factual information. At the same time their concerns increase and their general attitudes toward refugees become even more skeptical when provided information about refugees' education level, which is an important result for policy makers.

Panel B splits the sample by age and reveals that treatment effects on labor market concerns are significantly weaker for respondents above median age (55 years and older). At the same time, information treatment effects on fiscal burden concerns are stronger for older respondents, maybe because they are more attached to the public transfer system than they are to the labor market. Consistently, fiscal burden concerns of respondents who are currently working react significantly less to the information treatment (column 3 of panel C). Turning to gender differences, panel D shows that treatment effects are overall very similar for males and females, except that females adapt their fiscal burden concerns to a lesser extent in response to treatment *Information*. Panel E shows that the treatment effect on fiscal burden concerns is driven by respondents living in West Germany; East Germans' fiscal burden concerns are unaffected by the treatment. Finally, panel F shows that respondents with migration background do not decrease their fiscal burden concerns when confronted with treatment *Information*.

4.3 Exploring potential mechanisms

Next, we provide two sets of analyses to shed some light on potential channels through which treatment *Information* affects respondents' concerns and general attitudes.

First, we analyze respondents' self-reported importance that they attribute to various aspects when forming their attitude toward refugees. Appendix Table A2 regresses the importance of each of the six aspects (equal to 1 if the respondent considers a given aspect "very important" or "somewhat important", 0 otherwise) on the *Information* treatment indicator and other covariates. As the control-group means show, the most important aspect is *refugees' willingness to integrate* (83%), followed by *refugees' criminal behavior* (74%) and *humanitarian aspects* (64%); *economic aspects* (55%), *personal experience with refugees* (54%), and *religion/culture of refugees* (50%) are less important.¹⁴ The relative

¹³ In our sample, 11% of respondents identify themselves as long-term supporters of this party.

¹⁴ The importance of these six aspects differs only somewhat by respondents' education. The importance for tertiary (non-tertiary)-educated respondents is as follows: *refugees' willingness to integrate*: 87% (82%); *refugees' criminal behavior*: 70% (75%); *humanitarian aspects*: 73% (61%); *economic aspects*: 62% (53%); *personal experience with refugees*: 65% (51%); *religion/culture of refugees*: 52% (49%). Thus, while the overall ranking is quite similar, humanitarian and economic aspects seem to be somewhat more important for tertiary-educated

importance of non-economic factors might rationalize why a sizable share of respondents update their beliefs that refugees are well-educated in response to treatment *Information*, but do not change their general attitudes (compare treatment-effect sizes between Table 2 and Table 4).¹⁵ Apart from the marginally significant coefficient on the importance assigned to religion/culture, we find no significant information treatment effects on the stated importance of the different aspects, which indicates that the importance assigned to different attitude-forming aspects is relatively stable.

Second, we study respondents' perceptions about whether refugees are able to transfer their skills to the German labor market as a potential mediating factor between information about refugees' education level and concerns about labor market competition and the fiscal burden. In Appendix Table A3, we regress different indicators of agreement to the statement that refugees can apply their skills to the German labor market on the *Information* treatment indicator. Among the control group, 38 percent of respondents agree that refugees' skills are transferrable, whereas 52 percent disagree (see control means in columns 1 and 3). We find a strong positive treatment effect on perceived skill transferability: Treatment *Information* increases agreement that skills are transferrable by 8 percentage points and decreases disagreement by 7 percentage points. These findings have two potential implications for the interpretation of our main findings: First, the fact that a sizeable fraction of respondents doubts that refugees' skills are transferrable might attenuate information treatment effects on labor-market and fiscal burden concerns. Second, because treatment *Information* increases perceived skill transferability by more than 20 percent, an important channel for the treatment effects on labor market and fiscal burden concerns might be that the information treatment changes beliefs that refugees can apply their skills on the German labor market.

4.4 Robustness experiments with university students

In this section, we present additional experiments conducted with more than 5,000 university students to assess the robustness of our main findings.

Persistence of treatment effects

One potential issue with information experiments is that the information provided might trigger experimenter demand effects or priming effects instead of genuine belief updating.¹⁶ Following previous studies that argue that such unintended effects are unlikely to persist beyond the immediate survey horizon (e.g., Grigorieff, Roth, and Ubfal 2020; Haaland and Roth 2017; see also Cavallo, Cruces, and Perez-Truglia 2017), we investigate whether treatment effects persist until one week after information

respondents. Note, however, that these figures need to be interpreted with caution since the questions on the importance of these aspects were only posed to a subsample of 1,000 respondents.

¹⁵ Note that the results on attitude formation need to be interpreted with care since the aspects are not necessarily mutually exclusive, and may differ by the extent to which they are related to beliefs about refugees' education level.

¹⁶ *Experimenter demand effects* occur if the information provided contains indications about the experimenter's intentions and respondents answer accordingly to please the experimenter (Zizzo 2010; de Quidt, Haushofer, and Roth 2018). Similarly, specific words in the information provided might activate certain concepts in respondents' memory that influence their answering behavior unconsciously (*priming effects*).

provision. Combining data from the first robustness experiment and its re-survey one week later, we regress respondents' beliefs about refugees' education level on the *Information* treatment dummy, a re-survey dummy, and an interaction term of these two indicators (Appendix Table A4). The information treatment not only increases the share of respondents who agree that refugees are well-educated at the moment the information is provided, but substantially increases this share still about one week later in the re-survey, when the information is not provided again. As expected, the immediate treatment effect is stronger than the longer-run impact, which is likely due to imperfect recall. Consistent with recent evidence that survey experiments are robust to experimenter demand effects (Mummolo and Peterson, 2018), the persistence of treatment effects suggests that our experimental findings are due to genuine belief updating.

Social desirability bias

Another concern with survey answers – in particular on sensitive issues such as attitudes toward refugees – is that respondents might give socially desirable answers instead of answering honestly. To assess the extent to which social desirability bias is present in our survey, we implemented the *item count technique* (ICT) in our first robustness experiment (see Coffman, Coffman, and Ericson 2017 for a detailed description and validation of the ICT). The ICT randomly assigns survey respondents to a *direct response group* who are directly asked whether they agree with a sensitive item, or a *veiled response group* who are asked to indicate with how many of $N+1$ items (which include the sensitive item and N other items) they agree with. We used this technique to assess the social desirability bias for six potentially sensitive items: labor market competition concerns (both for respondent personally and in general); concerns about fiscal revenues and costs; concerns about refugees' criminal behavior; and two aspects shaping attitudes toward refugees (humanitarian aspects and economic aspects). In Appendix Table A5, we regress the number of statements that respondents agree with (out of $N+1 = 5$ statements) on a binary indicator for respondents in the *veiled response group*. We find several negative, statistically significant coefficients on the veiled indicator. Taken at face value, these estimates suggest that social desirability bias *increases* the probability of agreeing with the sensitive item when being asked directly. Importantly, however, the veiled coefficient is also relatively large (-11 percentage points) for the *non-sensitive* placebo item “*I used a laptop computer for completing this survey*”. While this coefficient estimate is not statistically significant due to limited statistical power, it indicates that fewer agreement to questions in the veiled response group is to some extent mechanical (see Coffman, Coffman, and Ericson 2017 for details). Therefore, we compute placebo-adjusted estimates by subtracting the veiled coefficient for the placebo item (column 7) from the veiled coefficients in columns 1 to 6 (see lower part of Appendix Table A5 and table notes for computational details). These adjusted coefficients are small and statistically insignificant, suggesting that social desirability bias is not a major concern in our survey.

Alternative information treatments

As discussed in Section 2, studies that aimed at quantifying the education or skill level of refugees at the beginning of the refugee crisis have produced heterogeneous, and sometimes even contradictory, findings. While treatment *Information* relies on the most direct and up-to-date information from the *IAB-BAMF-SOEP Survey of Refugees in Germany*, the second robustness experiment tests whether similar treatment effects arise when alternative information treatments are used.

Appendix Table A6 estimates the effects of providing optimistic factual information about refugees' education level in treatment *High Skilled*, and pessimistic information in treatment *Low Skilled* on respondents' beliefs that refugees are well educated on average. The *High Skilled* treatment increases the share of respondents who agree with the statement by 14 percentage points (from 18% agreement in the control group). Note that this treatment effect is fairly similar to the one in the representative sample (see Table 2). In contrast, the *Low Skilled* treatment strongly decreases the share of respondents with positive views on refugees' education level by 5 percentage points. The main take-away from this analysis is that respondents update their beliefs about refugees' education level in similar ways when alternative information treatments are used. Thus, the belief updating observed in our main experiment with a representative sample of adults in Germany does not seem to be driven by the specific content of treatment *Information*.

Comparison between university students and the general population

Finally, the fact that we conducted similar survey experiments among a representative sample of the general adult population and among university students enables us to draw comparisons between the two samples.¹⁷

We find several key differences. First, the general population is less optimistic about refugees' education level: The share of respondents who do *not* agree that refugees are well educated on average is larger in the representative sample (65%) than among students (39% to 45%). At the same time, treatment *Information* strongly shifts these beliefs upward in both samples. Second, the general population is more concerned about labor market competition and the fiscal burden than university students. For instance, 18% of the general population, but only 4% of students, are concerned that refugees increase competition for them personally.¹⁸ Furthermore, information treatment effects on concerns are considerably weaker for students than for the average adult. Third, university students' general attitudes toward refugees are more positive than of the general population: While only 22% of university students think that the number of refugees admitted to Germany was too high, this share is 71% in the representative adult sample.¹⁹ Concerning *Information* treatment effects, we only find positive effects on general attitudes for the representative population, but not for university students. Fourth, the attitude-formation process toward refugees differs substantially between university students

¹⁷ Please refer to Lergepporter, Piopiunik, and Simon (2017) for detailed analyses of the student samples.

¹⁸ Tertiary-educated respondents in the representative survey are somewhat less concerned than non-tertiary-educated respondents (14% versus 19%); hence, the large difference in personal labor market competition concerns between students and non-students does not seem to be due to different skill levels.

¹⁹ This share is much higher among tertiary-educated adults (59%) than among students, but lower than among non-tertiary-educated adults (75%).

and the general population: While students consider humanitarian aspects and personal experience with refugees much more important than the general population (86% versus 64% and 70% versus 54%, respectively), refugees' criminal behavior and economic aspects are much more important for the general population (74% versus 54% and 55% versus 39%, respectively). To investigate the reasons for these differences in the attitude-formation process requires further research, but they might be one reason for why the information treatment effects differ between university students and the general population.

In sum, university students and the general adult population differ markedly in terms of their beliefs, concerns, attitudes, attitude-formation aspects, and in their reactions to treatment *Information*. Interestingly, tertiary-educated respondents in the representative adult survey are more similar to non-tertiary-educated respondents than they are to university students. At the most basic level, our comparative findings extend the existing evidence that economic preferences, behavior, and attitudes of university students are not readily transferrable to the general population at large (e.g., Cappelen et al. 2015).²⁰

5. Discussion and conclusion

We conducted a randomized online survey experiment with a representative sample of more than 4,000 adults in Germany, and robustness experiments with more than 5,000 university students, to investigate how beliefs about refugees' education level affect attitudes toward them. We randomly provided research-based information about refugees' education level and find that this information (i) strongly increases beliefs that refugees are well educated, (ii) increases labor market competition concerns, (iii) decreases fiscal burden concerns, and (iv) improves overall attitudes toward refugees. The robustness experiments with university students show that treatment effects persist over a period of one week, effects are replicable using alternative information treatments, and survey answers are largely unaffected by social desirability bias. Comparing the representative adult sample with university students reveals that the latter group is generally more optimistic about refugees and reacts less to information provision.

Our findings have various implications for policymakers. First, information about refugees' education level changes attitudes toward them, which shows that providing citizens with relevant facts may foster the political feasibility of asylum policies. Second, the fact that non-economic aspects are crucial for shaping the general public's attitudes toward refugees indicates that policy makers might have some leeway to increase the public acceptance of refugees by emphasizing non-economic aspects, such as humanitarian aspects or refugees' willingness to integrate, instead of economic aspects.

²⁰ University students differ from the general population in various dimensions (e.g., age, future income, parental background, education). While our finding that younger respondents react stronger to the treatment in terms of their labor market competition concerns (see the heterogeneity analysis in section 4.2) suggests that smaller treatment effects for students cannot be fully due to their younger age, pinning down the exact reasons for why university students' survey responses differ from the general populations is beyond the scope of this paper. Such an investigation would be very interesting for future research.

While survey experiments are certainly subject to some artificiality, we consider this method informative and well-suited for answering our research questions for three reasons. First, to identify the causal effect of beliefs about refugees' education level on attitudes with observational data, one would need detailed measures of attitudes as well as exogenous variation in education beliefs. We are not aware of any data source that fulfills both requirements. Second, Barabas and Jerit (2010) provide evidence for the external validity of survey experiments. They show that the information effects in their survey experiment are also present in a natural setting, in which news exposure covers the same information. Therefore, survey experiments are able to uncover information effects that are also present in a natural environment. Similarly, survey responses on attitudes toward migration have been shown to correspond closely to incentivized, actual political behavior. Third, Blinder and Krueger (2004) argue that public opinion surveys are important for the political process as politicians devote enormous resources to assessing public opinion through surveys. In the light of the European refugee crisis, much of the political debate has focused on natives' attitudes toward refugees and asylum policies, which are typically measured in opinion surveys. The present paper aims at contributing to understanding the underlying determinants that drive public attitudes that may strongly affect the political feasibility of asylum policy.

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Figures and Tables

Table 1: Comparison of socio-demographic characteristics across control and treatment group

	Mean	Difference
	Control group	Treatment group – control group
	(1)	(2)
Female	0.52	0.00
Age	51.23	0.36
West Germany	0.79	0.00
Basic school degree	0.23	-0.01
Intermediate school degree	0.35	-0.01
Applied university qualification	0.10	0.01
High school degree	0.30	0.01
Non-tertiary educated		
No vocational degree	0.10	0.00
Vocational degree	0.65	-0.02
Tertiary educated		
Tertiary degree	0.25	0.01
Born in Germany	0.94	0.00
No parent born abroad	0.87	0.00
One parent born abroad	0.05	0.01
Fulltime employed	0.36	-0.02
Parttime employed	0.13	-0.00
Self employed	0.04	0.01*
Unemployed	0.05	-0.00
House wife/husband	0.06	-0.00
Pensioner	0.29	0.02
CDU/CSU	0.18	0.01
SPD	0.16	0.00
Gruene	0.13	-0.00
Linke	0.10	-0.00
FDP	0.06	-0.00
AfD	0.11	-0.01
Respondents	1,931	2,076

Notes: Column (1) reports means of the control group. Column (2) reports the difference in means between control group and treatment group. Significance levels of differences come from linear regressions of characteristics on the treatment group indicator. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Information treatment effects on beliefs about refugees' education level

	Agree			Disagree			Five-point scale		
	(1)	(2)	(3)	(4)	(5)	(6)	(5)	(6)	(6)
Panel A: Full sample									
Information treatment	0.183*** (0.014)	0.182*** (0.013)	-0.170*** (0.015)	-0.168*** (0.015)	0.487*** (0.037)	0.479*** (0.035)			
Covariates	No	Yes	No	Yes	No	Yes	No	No	Yes
Control mean	0.18	0.18	0.65	0.65	2.27	2.27	2.27	2.27	2.27
Observations	4,009	4,009	4,009	4,009	4,009	4,009	4,009	4,009	4,009
Adj. R2	0.04	0.08	0.03	0.08	0.04	0.04	0.04	0.04	0.13
Panel B: Tertiary educated									
Information treatment	0.182*** (0.027)	0.190*** (0.027)	-0.176*** (0.030)	-0.181*** (0.030)	0.471*** (0.073)	0.486*** (0.070)			
Covariates	No	Yes	No	Yes	No	Yes	No	No	Yes
Control mean	0.19	0.19	0.63	0.63	2.36	2.36	2.36	2.36	2.36
Observations	1,042	1,042	1,042	1,042	1,042	1,042	1,042	1,042	1,042
Adj. R2	0.04	0.08	0.03	0.08	0.04	0.04	0.04	0.04	0.13
Panel C: Non-tertiary educated									
Information treatment	0.183*** (0.016)	0.179*** (0.015)	-0.167*** (0.018)	-0.161*** (0.017)	0.490*** (0.042)	0.473*** (0.041)			
Covariates	No	Yes	No	Yes	No	Yes	No	No	Yes
Control mean	0.17	0.17	0.66	0.66	2.23	2.23	2.23	2.23	2.23
Observations	2,967	2,967	2,967	2,967	2,967	2,967	2,967	2,967	2,967
Adj. R2	0.04	0.08	0.03	0.09	0.04	0.04	0.04	0.04	0.13

Notes: Dependent variables: agreement to statement "On average, refugees are well educated": Columns (1)+(2): binary variable (1="completely agree" or "somewhat agree", 0 otherwise); Columns (3)+(4): binary variable (1="completely disagree" or "somewhat disagree", 0 otherwise); Columns (5)+(6): integer values from 1 to 5 (1="completely disagree", 2="somewhat disagree", 3="neither agree nor disagree", 4="somewhat agree", 5="completely agree"). *Covariates* include all characteristics from Table 1. Panel A includes all respondents, Panel B all respondents with tertiary education degrees, and Panel C all other respondents; see Section 5.1. *Control mean* is the mean of the indicated outcome of respondents in the control group. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Information treatment effects on labor market and fiscal burden concerns

Index	Labor market concerns			Fiscal burden concerns		
	Increase competition for me	Increase competition in general	Index	More revenues than costs	Pay more taxes	Less gov't benefits
	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Full sample						
Information treatment	0.118*** (0.027)	0.036*** (0.012)	0.055*** (0.015)	-0.076*** (0.027)	0.068*** (0.013)	-0.016 (0.017)
Control mean	0.18	0.39	0.04	0.22	0.53	0.38
Respondents	4,009	4,009	2,992	4,009	2,992	2,992
Panel B: Tertiary educated						
Information treatment	0.111** (0.050)	0.046** (0.021)	0.071** (0.030)	-0.072 (0.053)	0.073*** (0.028)	-0.013 (0.035)
Control mean	0.14	0.34	-0.13	0.30	0.45	0.31
Respondents	1,042	1,042	779	1,042	779	779
Panel C: Non-tertiary educated						
Information treatment	0.121*** (0.032)	0.032** (0.015)	0.050*** (0.018)	-0.079** (0.031)	0.066*** (0.015)	-0.019 (0.020)
Control mean	0.19	0.41	0.11	0.20	0.56	0.41
Respondents	2,967	2,967	2,213	2,967	2,213	2,213

Notes: Dependent variables: Column (1): index of labor market concerns, consisting of the two indicators in Columns (2) and (3). Column (4): index of fiscal burden concerns, consisting of the three indicators in Columns (5) to (7). Columns (2), (3), (5), (6), and (7): dummy variables which express agreement with the respective statement (1="completely agree" or "somewhat agree", 0 otherwise). See Appendix A for the wording of all survey questions and Section 3.1 for the construction of the summary indices. All regressions include the characteristics reported in Table 1. Panel A includes all respondents, Panel B all respondents with tertiary education degrees, and Panel C all other respondents; see Section 5.1. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Information treatment effects on general attitudes

Index	Number of refugees admitted in 2015		Allowed to stay permanently
	Panel A: Full sample		
	(1)	(2)	(3)
Information treatment	0.135*** (0.029)	-0.021 (0.016)	0.075*** (0.014)
Control mean	-0.07	0.71	0.30
Respondents	2,992	2,992	4,009
	Panel B: Tertiary educated		
	(1)	(2)	(3)
Information treatment	0.099* (0.060)	-0.007 (0.034)	0.051* (0.029)
Control mean	0.21	0.59	0.42
Respondents	779	779	1,042
	Panel C: Non-tertiary educated		
	(1)	(2)	(3)
Information treatment	0.152*** (0.034)	-0.028 (0.018)	0.083*** (0.016)
Control mean	-0.17	0.75	0.26
Respondents	2,213	2,213	2,967

Notes: Dependent variables: Column (1): index of general attitudes, consisting of the two indicators in Columns (2) and (3). Columns (2) and (3): dummy variables which express agreement with the respective statement (1="completely agree" or "somewhat agree", 0 otherwise). See Appendix A for the wording of all survey questions and Section 3.1 for the construction of the summary index. All regressions include the characteristics reported in Table 1. Panel A includes all respondents, Panel B all respondents with tertiary education degrees, and Panel C all other respondents; see Section 5.1. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

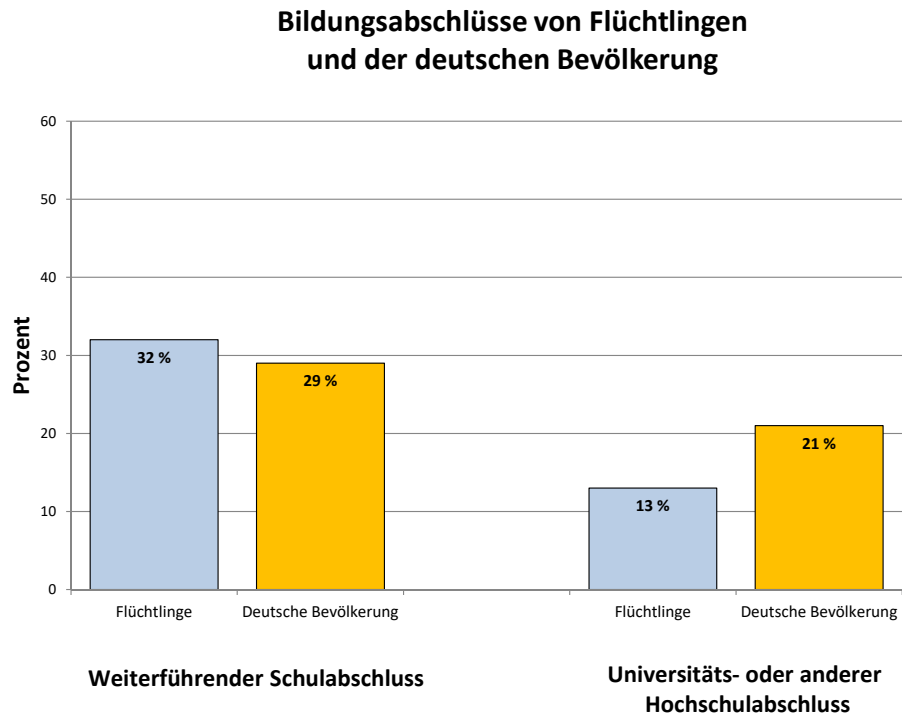
Table 5: Heterogeneity of information treatment effects

	Well educated (agree) (1)	Labor market concerns (index) (2)	Fiscal burden concerns (index) (3)	General attitudes (index) (4)
Panel A: AfD				
Information treatment	0.211*** (0.014)	0.072*** (0.028)	-0.179*** (0.030)	0.248*** (0.033)
AfD x treatment	-0.271*** (0.025)	0.335*** (0.076)	0.908*** (0.053)	-1.018*** (0.044)
Panel B: Age				
Information treatment	0.180*** (0.017)	0.180*** (0.034)	-0.034 (0.036)	0.126*** (0.039)
Old x treatment	0.006 (0.021)	-0.149*** (0.038)	-0.109** (0.043)	0.040 (0.046)
Panel C: Working				
Information treatment	0.200*** (0.018)	0.092*** (0.034)	-0.172*** (0.037)	0.157*** (0.040)
Working x treatment	-0.032 (0.021)	0.025 (0.038)	0.160*** (0.043)	-0.019 (0.046)
Panel D: Female				
Information treatment	0.181*** (0.018)	0.109*** (0.035)	-0.139*** (0.038)	0.176*** (0.041)
Female x treatment	0.005 (0.021)	-0.007 (0.039)	0.095** (0.043)	-0.056 (0.046)
Panel E: West Germany				
Information treatment	0.161*** (0.024)	0.100** (0.047)	-0.015 (0.048)	0.091* (0.053)
West Germany x treatment	0.028 (0.026)	0.007 (0.048)	-0.094* (0.050)	0.071 (0.054)
Panel F: Migration background				
Information treatment	0.181*** (0.014)	0.103*** (0.028)	-0.106*** (0.031)	0.155*** (0.034)
Migration background x treatment	0.015 (0.031)	0.019 (0.061)	0.132** (0.065)	-0.065 (0.069)
Number of observations are identical in each panel:				
Observations	4009	4009	2992	2992

Notes: Dependent variables: Column (1): agreement to statement “On average, refugees are well educated” (1=“completely agree” or “somewhat agree”, 0 otherwise); Column (2): index of labor market competition concerns; Column (3): index of fiscal burden concerns; Column (4): index of general attitudes. *AfD* equals 1 for respondents who identify themselves as long-term supporters of this party; 0 otherwise. *Old* equals 1 for respondents who are older than 54 years (median age in our sample); 0 otherwise. *Working* equals 1 for respondents who are part-time or full-time employed or self-employed; 0 otherwise. *West Germany* equals 1 for respondents living in West Germany; 0 otherwise. *Migration background* equals 1 if the respondent herself or at least one parent was born abroad; 0 otherwise. Each regression additionally includes a binary indicator for the respective subgroup. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Appendix A

Figure A1: Illustration of information treatment



Notes: This figure was used to depict the shares of refugees (blue bars) and natives (yellow bars) in Germany who achieved a high school degree (left two bars) and a university degree (right two bars), respectively.

Figure A2: Experimental design in ifo Education Survey 2019

Randomization between Control group (p=0.5) and treatment <i>Information</i> (p=0.5)	
<p>Control group: Elicitation of ...</p> <p>1.1. Perceived education level</p> <p><i>Labor market concerns</i></p> <p>1.2. Increase competition for me 1.3. Increase competition in general</p> <p><i>Fiscal burden concerns</i></p> <p>1.4. More revenues than costs</p> <p><i>General attitudes</i></p> <p>1.5. Allowed to stay permanently</p>	<p>Information: Elicitation of ...</p> <p>1.1. Perceived education level</p> <p><i>Labor market concerns</i></p> <p>1.2. Increase competition for me 1.3. Increase competition in general</p> <p><i>Fiscal burden concerns</i></p> <p>1.4. More revenues than costs</p> <p><i>General attitudes</i></p> <p>1.5. Allowed to stay permanently</p>
Randomization between eliciting concerns and attitudes (p=0.75) and aspects governing opinion formation process (p=0.25)	
<p>Further concerns and attitudes:</p> <p><i>Fiscal burden concerns</i></p> <p>2.2 Pay more taxes 2.3 Less government benefits</p> <p><i>General attitudes</i></p> <p>2.3 Number of refugees admitted in 2015</p> <p>Perceived skill transferability</p> <p>2.4 Refugees can apply their skills</p>	<p>Importance of aspects:</p> <p>2.1 Humanitarian aspects 2.2 Economic aspects 2.3 Refugees' willingness to integrate</p> <p>2.4 Religion/culture of refugees 2.5 Refugees' criminal behavior 2.6 Personal experience with Refugees</p>

Notes: The figure depicts the experimental design implemented in the ifo Education Survey 2019. Randomization at the two stages was independent.

Table A1: Wording of survey questions

Content	Wording	Answer categories
Perceived education level	<i>"On average, the refugees are well educated."</i>	Answer categories: completely agree, somewhat agree, neither agree nor disagree, somewhat disagree, completely disagree
Labor market concerns 1: "Increase competition for me"	<i>"The refugees will increase competition on the labor market for me personally."</i>	See above
Labor market concerns 2: "Increase competition in general"	<i>"In general, the refugees will increase competition on the labor market."</i>	See above
Fiscal concerns 1: "More revenues than costs"	<i>"The refugees will bring more revenues than costs for the government."</i>	See above
Fiscal concerns 2: "Pay more taxes"	<i>"Due to the government spending for refugees, I will have to pay more taxes in the future."</i>	See above
Fiscal concerns 3: "Less government benefits"	<i>"Due to the government spending for refugees, I will have to forgo government benefits in the future."</i>	See above
General attitudes 1: "Number of refugees admitted in 2015"	<i>"What do you think about the number of refugees which Germany admitted since 2015?"</i>	Answer categories: far too many, somewhat too many, about the right amount, somewhat too few, far too few
General attitudes 2: "Allowed to stay permanently"	<i>"Do you favor or oppose that refugees are allowed to stay in Germany permanently?"</i>	Answer categories: strongly favor, somewhat favor, neither favor nor oppose, somewhat oppose, strongly oppose.
Aspects governing opinion formation process 1: "Humanitarian aspects"	"Humanitarian aspects"	Answer categories: very important, somewhat important, neither important nor unimportant, somewhat unimportant, very unimportant
Aspects governing opinion formation process 2: "Economic aspects"	"Economic aspects"	See above
Aspects governing opinion formation process 3: "Refugees' willingness to integrate"	"Refugees' willingness to integrate"	See above
Aspects governing opinion formation process 4: "Religion/culture of refugees"	"Religion/culture of refugees"	See above
Aspects governing opinion formation process 5: "Refugees' criminal behavior"	"Refugees' criminal behavior"	See above
Aspects governing opinion formation process 6: "Personal experience with refugees"	"Personal experience with refugees"	See above
Perceived skill transferability	<i>"The refugees can apply the skills they bring to Germany to the German labor market."</i>	Answer categories: completely agree, somewhat agree, neither agree nor disagree, somewhat disagree, completely disagree

Table A2: Information treatment effects on opinion formation aspects

	Refugees' willingness to integrate		Humanitarian aspects		Personal experience w/ refugees	
	Important (1)	Unimportant (2)	Important (3)	Unimportant (4)	Important (5)	Unimportant (6)
Information treatment	-0.015 (0.023)	0.013 (0.013)	-0.012 (0.029)	0.011 (0.018)	0.004 (0.031)	0.019 (0.023)
Control mean	0.83	0.04	0.64	0.10	0.54	0.15
Respondents	1,017	1,017	1,017	1,017	1,017	1,017
	Refugees' criminal behavior		Religion/culture of refugees		Economic aspects	
	Important (1)	Unimportant (2)	Important (3)	Unimportant (4)	Important (5)	Unimportant (6)
Information treatment	0.008 (0.027)	0.026 (0.016)	-0.052* (0.031)	-0.008 (0.026)	0.035 (0.031)	0.021 (0.022)
Control mean	0.74	0.05	0.50	0.22	0.55	0.13
Respondents	1,017	1,017	1,017	1,017	1,017	1,017

Notes: Dependent variables: importance of various aspects for respondents' opinion formation process toward refugees; respondents rated each aspect on a five-point scale: very important, somewhat important, neither important nor unimportant, somewhat unimportant, and very unimportant. *Important* equals 1 for "very important" or "somewhat important", 0 otherwise; *unimportant* equals 1 for "very unimportant" or "somewhat unimportant", 0 otherwise. All regressions include the characteristics reported in Table 1. *Control mean* is the mean of the indicated outcome of respondents in the control group. See Appendix A for the wording of all survey questions. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A3: Information treatment effects on perceived skill transferability

	Agree		Disagree		Five-point scale	
	(1)	(2)	(3)	(4)	(5)	(6)
Information treatment	0.083*** (0.018)	0.083*** (0.017)	-0.075*** (0.018)	-0.071*** (0.018)	0.231*** (0.046)	0.224*** (0.044)
Covariates	No	Yes	No	Yes	No	Yes
Control mean	0.38	0.38	0.52	0.52	2.76	2.76
Observations	2,992	2,992	2,992	2,992	2,992	2,992
Adj. R2	0.01	0.08	0.01	0.08	0.01	0.12

Notes: Dependent variables: agreement to statement "The refugees can apply the skills they bring to Germany to the German labor market": Columns (1)+(2): binary variable (1="completely agree" or "somewhat agree", 0 otherwise); Columns (3)+(4): binary variable (1="completely disagree" or "somewhat disagree", 0 otherwise); Columns (5)+(6): integer values from 1 to 5 (1="completely disagree", 2="somewhat disagree", 3="neither agree nor disagree", 4="somewhat agree", 5="completely agree"). *Covariates* include all characteristics from Table 1. *Control mean* is the mean of the indicated outcome of respondents in the control group. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A4: Persistence of information treatment effects on beliefs about refugees' education level (student survey)

	Agree	Disagree	Five-point scale
	(1)	(2)	(3)
Information treatment	0.357*** (0.052)	-0.276*** (0.053)	0.770*** (0.105)
Re-survey	0.043* (0.023)	-0.057* (0.032)	0.106** (0.046)
Information treatment * re-survey	-0.143*** (0.048)	0.114*** (0.042)	-0.292*** (0.075)
Covariates	Yes	Yes	Yes
Control mean	0.16	0.44	2.66
<i>Information treatment effect in re-survey</i>	0.214*** (0.054)	-0.162*** (0.054)	0.478*** (0.103)
Observations (respondents)	281	281	281
Adj. R2	0.15	0.13	0.19

Notes: Dependent variables: agreement to statement "On average, refugees are well educated." Column (1): binary variable (1="completely agree" or "somewhat agree", 0 otherwise); Column (2): binary variable (1="completely disagree" or "somewhat disagree", 0 otherwise); Column (3): integer values from 1 to 5 (1="completely disagree", 2="somewhat disagree", 3="neither agree nor disagree", 4="somewhat agree"; 5="completely agree"). *Information treatment effect in re-survey* is the linear combination of the coefficients on *Information treatment* plus *Information treatment * re-survey*. *Covariates* include all characteristics from Appendix Table A2. Regressions only include respondents who participated in the follow-up survey and in the re-survey about one week later; see Section 3.2. Robust standard errors, adjusted for clustering at the respondent level, in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A5: Effect of veiled response treatment (student survey)

	Increase competition for me (1)	Increase competition in general (2)	More revenues than costs (3)	Refugees' criminal behavior (4)	Humanitarian aspects (5)	Economic aspects (6)	Laptop usage (7)
Veiled	-0.045 (0.076)	-0.188** (0.083)	-0.113 (0.081)	-0.202** (0.082)	-0.270*** (0.094)	-0.206*** (0.075)	-0.112 (0.090)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Veiled (adjusted)	0.067 [0.381]	-0.076 [0.357]	-0.001 [0.992]	-0.090 [0.271]	-0.158 [0.093]	-0.094 [0.206]	0 [1.000]
Mean (direct response)	0.06	0.44	0.38	0.41	0.95	0.69	0.42
Observations	554	555	553	555	554	555	555
Adj. R2	0.13	0.10	0.07	0.01	0.07	0.03	0.05

Notes: Dependent variables: agreement to the statements indicated in the top row (only two answer categories: agree or disagree). *Veiled* equals 1 if respondent has been assigned to veiled response group and 0 if assigned to direct response group; see Section 4.7. *Veiled (corrected)* is the veiled coefficient corrected for the "mechanical effect", represented by the coefficient on *laptop usage*; see discussion in Section 4.7. The corrected veiled coefficient is the veiled coefficient from the respective regression minus the veiled coefficient in the laptop usage regression (i.e., -0.112). The numbers in square brackets are the p-values from a two-sided test that the corrected veiled coefficient equals 0. *Mean (direct response)* is the mean of the outcome of respondents in the direct response group. *Covariates* include all characteristics from Appendix Table A2. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A6: Information treatment effects on beliefs about refugees' education level (student survey)

	Agree		Disagree		Five-point scale	
	(1)	(2)	(3)	(4)	(5)	(6)
High skilled information	0.144*** (0.015)	0.140*** (0.015)	-0.100*** (0.017)	-0.104*** (0.016)	0.307*** (0.035)	0.312*** (0.034)
Low skilled information	-0.051*** (0.013)	-0.048*** (0.013)	0.078*** (0.017)	0.071*** (0.017)	-0.142*** (0.033)	-0.125*** (0.032)
Covariates	No	Yes	No	Yes	No	Yes
Control mean	0.18	0.18	0.39	0.39	2.67	2.67
Observations	4,831	4,831	4,831	4,831	4,831	4,831
Adj. R2	0.04	0.07	0.02	0.07	0.04	0.10

Notes: Dependent variables: agreement to statement "On average, refugees are well educated": Columns (1)+(2): binary variable (1="completely agree" or "somewhat agree", 0 otherwise); Columns (3)+(4): binary variable (1="completely disagree" or "somewhat disagree", 0 otherwise); Columns (5)+(6): integer values from 1 to 5 (1="completely disagree", 2="somewhat disagree", 3="neither agree nor disagree", 4="somewhat agree", 5="completely agree"). *Covariates* include all characteristics from Table 1. *Control mean* is the mean of the indicated outcome of respondents in the control group. Robust standard errors reported in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Appendix B: Description of item count technique (ICT)

The item count technique (ICT) is a well-established experimental survey method to measure the extent of social desirability bias. This bias arises when respondents, instead of answering truthfully, provide answers they believe to be socially desirable (Maccoby and Maccoby 1954, Edwards 1957, Fisher 1993). Our ICT design largely follows that in Coffman et al. (2017). Respondents are randomly assigned to either a direct response group or a veiled response group. (Respondents keep their group assignment for all questions.) Participants in the direct response group are asked to answer a sensitive question directly (e.g., agreement with statement “Economic aspects are important for my opinion formation process toward refugees”). In addition, they are asked to indicate how many other N statements they agree with. These N statements can include sensitive and nonsensitive items. We decided to include other statements on refugees that were not related to the sensitive item of interest. In contrast, respondents in the veiled response group report how many of all $N+1$ statements (the sensitive statement plus the N other statements) they agree with. These $N+1$ statements are the same as in the direct response group. The difference in the average agreement with the $N+1$ statements between the veiled response group and the direct response group is interpreted as the extent of under- or over-reporting due to social desirability bias. Adding this difference to the share of respondents who agree with the sensitive statement in the direct response group yields the true mean share of agreement with the sensitive statement. In addition to using the ICT technique for sensitive statements, we followed Coffman et al. (2017) and conducted an additional ICT experiment for a nonsensitive placebo item (“I used a laptop computer for completing the survey”). This (non-critical) placebo item is unlikely to be affected by social desirability bias, which means that the average agreement with the placebo item should not differ between the direct response group and the veiled response group. To compare average numbers of agreement across the two groups of respondents, the ICT requires that all items are binary. Therefore, we use dummy variables to measure our ICT outcomes in the follow-up survey experiment (“agree” versus “disagree”) instead of using five-point scales as in the main survey. Note that the randomization of respondents for the information treatment was completely independent of the randomization of respondents for the ICT.