Biased Beliefs about Immigration, Economic Concerns, and Information Provision.[*]

Pre-Analysis Plan

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Abstract

We conduct an information provision experiment to investigate the relevance of statistical information for economic attitudes towards immigration. Our experimental design is embedded into a large-scale representative online survey. We randomize the provision of information on the share and the unemployment rate of foreigners, representing facts about immigration related to the size and economic characteristics of the immigrant population, respectively. We aim to analyze the effect of information provision on two prominent economic channels of immigration attitudes: welfare state and labor market concerns about immigration. In addition, we examine whether biases in beliefs about immigration translate into immigration policy preferenes and preferences for redistribution in host societies.

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1 Motivation

During the recent decade, several studies presented evidence for increases in economic nationalism and public opposition towards immigration (see e.g. Barone et al. (2016), Colantone and Stanig (2019), and Halla et al. (2017)). In conjunction, the literature also consistently reports a tendency of native populations to be misinformed about factual information about immigration to their societies, e.g. in relation to the share and the unemployment rate of immigrants (Barrera et al. 2020; Citrin and Sides 2008).

Given these biased beliefs of individuals, a recent strand of literature evaluates the effect of information provision on immigration attitudes and policy preferences, presenting mixed evidence on its effectiveness (Grigorieff et al. 2020; Hopkins et al. 2019). Other studies investigate whether misperceptions and information about immigration influence natives' preferences for redistribution (Alesina et al. 2018), while presenting evidence for null effects in terms of information about the share and origins of immigrants.

This mixed evidence raises the question whether these observed differences in treatment effects are based on the quantity or type of information which is provided to individuals. Previous studies also mostly focus on attitudes towards immigration and policy preferences which are more general in nature, or do not provide statistical information on the economic characteristics of immigration.

We aim to extend this literature by experimentally evaluating potential differences concerning the quantity and the type of information provided, focussing on two key facts about immigration: the share and the unemployment rate of foreigners. In addition, we aim to investigate how information provision translates into economic concerns about immigration. Specifically, we examine the welfare state and labor market channels of attitudes towards immigration emphasized in the seminal model by Facchini and Mayda (2009). We expand this analysis by also accounting for immigration policy preferences and preferences for redistribution in a joint setting, again evaluating potential differences between information on the size and economic characteristics of the immigrant population.

2 Experimental Design

Our experimental design draws from prior work by Alesina et al. (2018), Grigorieff et al. (2020), Hopkins et al. (2019), and Lergetporer et al. (2017). We extend their designs by systematically disentangling treatment effects of the quantity and type of statistical information provided to survey respondents.

Specifically, we experimentally vary the quantity and the type of facts about immigration provided between treatment arms, incorporating information on both the size and economic characteristics of the immigrant population. In the following, we will introduce the details of our experimental design, which consists of four stages and three treatment arms. The following descriptions largely draw from an earlier study which focussed on Eastern Germany (Bareinz and Uebelmesser 2020).

Our survey experiment also contains a fifth experimental group. This group is similar to the passive control group in that it receives no information. However, we randomize the order of a question block on the COVID-19 crisis between the control group and the fifth group to investigate whether there exist priming effects on our outcome variables related to the ongoing health and economic crisis. In the following, we will refer to our information provision experiment as the *main* experiment, while the investigation related to our fifth experimental group is described as the *priming* experiment.

2.1 Elicitation of prior beliefs

First stage:

- Elicitation of respondents' beliefs about two key statistics of immigration: share and unemployment rate of foreigners[1]

- Additional elicitation of respondents' beliefs about the general unemployment rate as a benchmark for their beliefs about federal statistics in general

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[1] In conjunction with the definition which is used by German Federal Office of Statistics, we define immigrants based on their citizenship. All survey respondents are provided with this definition during the survey.

2.2 Treatment arms

Second stage:

- Random subsets of respondents are provided with true information about the share and/or the unemployment rate of foreigners

- **Treatment arm** *A***:** share of foreigners (representing size of the immigrant population)

- **Treatment arm** *B***:** unemployment rate of foreigners (representing economic characteristics of the immigrant population)

- **Treatment arm** *C***:** share *and* unemployment rate of foreigners (representing a bundle of both types of information)

- **Control group:** does not receive any information

The two types of statistical information distinguish between facts about the size of the immigrant population, and information on its economic characteristics, represented by the unemployment rate of foreigners. In addition, treatment arm *C* allows us to investigate the dimension of quantity in terms of a bundle of both types of information. The information treatments further involve conditional feedback on respondents' prior beliefs for the three treatment arms, based on the statistic(s) which are provided in each case.[2]

The following list contains the wording of our information treatments:[3]

- **Treatment arm** *A***:**

  "We will take a brief look at your estimate of the share of foreigners in Germany:

  The official share of foreigners in Germany is around 13 percent. Your estimate of [show estimate] was therefore [too low / quite accurate / too high]".

- **Treatment arm** *B***:**

  "We will take a brief look at your estimate of the unemployment rate of foreigners in

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[2]We allow for a margin of error of ±1 percentage points for respondents to receive the feedback of correct estimation.

[3]In addition to the information treatments, we disclose the sources of the information provided to ensure its credibility. Specifically, the information on the share of foreigners stems from the German Federal Statistical Office, while the information on the unemployment rate of foreigners stems from the German Federal Employment Agency.

Germany:

The official unemployment rate of foreigners in Germany is around 15 percent. Your estimate of [show estimate] was therefore [too low / quite accurate / too high]".

- **Treatment arm** *C***:**

  "We will take a brief look at your two estimates:

  The official share of foreigners in Germany is around 13 percent. Your estimate of [show estimate] was therefore [too low / quite accurate / too high].

  The official unemployment rate of foreigners in Germany is around 15 percent. Your estimate of [show estimate] was therefore [too low / quite accurate / too high]".

2.3 Outcome variables

Third stage:

- Respondents are asked literature-based survey measures of attitudes towards immigration and preferences for redistribution:

- *Welfare state and labor market concerns about immigration (economic channels)*

- *Immigration policy preferences*

- *Preferences for redistribution*

With respect to economic attitudes towards immigration, the welfare state and labor market channels are emphasized by theory (Facchini and Mayda 2009) and have also been extensively investigated by empirical research (Scheve and Slaughter 2001; Ortega and Polavieja 2012; Dahlberg et al. 2012; Hainmueller and Hiscox 2010; Naumann et al. 2018). We follow the notion put forward by Facchini and Mayda (2009), in which the welfare state channel relates to concerns about adverse effects of immigration on taxation and public good provision, while the labor market channel reflects concerns about increases in labor market competition. The wording for the respective survey measures is based on the European Social Survey (ESS):

- **Welfare state concerns:** "Immigrants pay taxes and receive social benefits from the health care and social insurance systems. On balance, do you think that immigrants in Germany receive more social benefits than they pay taxes, or that they pay more taxes than they

receive social benefits?". Answers range from 0 for "Receive more social benefits" to 10 for "Pay more taxes".

- **Labor market concerns:** "Do you think that immigrants rather take away jobs from workers in Germany, or that they rather help to create new jobs?". Answers range from 0 for "Take jobs away" to 10 for "Create new jobs".

In addition to economic concerns about immigration, we also investigate the effect of information provision on general immigration policy preferences. Specfically, we employ the following wording which is often used in the related literature (Card et al. 2012; Grigorieff et al. 2020; Mayda 2006; Scheve and Slaughter 2001).[4]

- **Immigration policy preferences:** "Do you think that the number of immigrants coming to Germany each year should be: decreased a lot / decreased slightly / stay the same / increased slightly / increased a lot?".

We expand our analysis by also investigating the effects of information provision on preferences for redistribution. In a recent study, Alesina et al. (2018) investigate whether information on the share or origin of immigrants affects preferences for redistribution, finding no evidence for information effects. We aim to extend their analyses by including statistical information about economic characteristics of the immigrant population, represented by the unemployment rate of foreigners, in addition to information on its size, i.e. the share of foreigners. We hypothesize that inherintly economic statistical facts about immigration may translate differently into preferences for redistribution in host societies. For our measures of preferences for redistribution, we employ the following wording based on Alesina et al. (2018):

- **Preferences for redistribution:** "Some people think that the government should not care about income differences between rich and poor people. Others think that the government should do everything in its power to reduce income inequality. What do you think?". Answers range from 0 for "Government should not care about income inequality" to 10 for "Government should do everything against income inequality".

[4]While it is sometimes differentiated between characteristics of the origin country, ethnicity, or legal status of immigrants, our employed survey measure refers to policy preferences about immigration in general.

We code all of our outcome variables such that a higher value indicates a more positive attitude towards immigration or a more supportive attitude towards redistribution, respectively. Labor market concerns, welfare state concerns, and preferences for redistribution are measured on an 11-point scale, and immigration policy preferences are measured on a 5-point scale, respectively.

2.4 Elicitation of posterior beliefs

Fourth stage:

- Elicitation of posterior beliefs about the share and/or the unemployment rate of foreigners for respondents in one of the treatment arms:

- Treatment *A*: elicitation of posterior beliefs about the share of foreigners

- Treatment *B*: elicitation of posterior beliefs about the unemployment rate of foreigners

- Treatment *C*: elicitation of posterior belifs about the share *and* the unemployment rate of foreigners

We elicite posterior beliefs at the very end of the survey in order to reduce concerns about experimenter demand. The elicitation of posterior beliefs allows us to investigate whether respondents in the treatment arms engage in belief updating after the receipt of facts about immigration.

2.5 Priming experiment

The fifth experimental group allows for the examination of potential priming effects regarding the COVID-19 crisis and also represents an active control group with respect to our main experiment. Respondents in this group of the priming experiment do not receive any information, as does the passive control group in our main experiment. In contrast to the control group from our main experiment, they are, however, primed by a question block on COVID-19 to think about the ongoing health and economic crisis before answering to our outcome measures.

We then aim to examine whether respondents in this group differ in terms of their immigration and policy attitudes when compared to the passive control group. This allows us both to

account for the COVID-19 crisis in relation to our main experiment, and further enables us to directly investigate its potential effects on attitudes towards immigration and preferences for redistribution.

3 Main Hypotheses

In the following, we present our main hypotheses following their original formulation in Bareinz and Uebelmesser (2020). We focus on the case of overestimation which is supported by findings in the recent literature on beliefs about immigration (Alesina et al. 2018; Barrera et al. 2020; Grigorieff et al. 2020; Hopkins et al. 2019). In this setting, respondents' beliefs about the share and the unemployment rate of foreigners are positively biased, on average:

Hypothesis I – Welfare state channel: Information provision translates into a more positive assessment of immigrants' welfare state contribution and hence lower welfare state concerns when respondents learn about a smaller size of the immigrant population and/or higher employedness of immigrants than believed ex ante on average.

Hypothesis IIa – Labor market channel: scenario a.: Information provision translates into *lower* concerns of respondents about labor market competition when they learn about a smaller size of the immigrant population and/or higher employedness of immigrants than believed ex ante on average. In this scenario, the higher employedness of immigrants and the lower size of the immigrant population are perceived as *less current* competition on the job market.

Hypothesis IIb – Labor market channel: scenario b.: Information provision translates into *the same or larger* concerns of respondents about labor market competition when they learn about a smaller size of the immigrant population and higher employedness of immigrants than believed ex ante on average. In this scenario, the higher employedness of immigrants is perceived as *larger potential* competition on the job market, while the lower size of the immigrant population is, again, perceived as *less current* competition on the job market, potentially offsetting each other.

Hypothesis III – Immigration policy preferences: Information provision translates into more positive immigration policy preferences of respondents when they learn about a smaller size of the immigrant population and/or higher employedness of immigrants than believed ex ante on average.

Hypothesis IV – Preferences for redistribution: Information provision translates into more supportive preferences for redistribution of respondents when they learn about a smaller size of the immigrant population and/or higher employedness of immigrants than believed ex ante on average.

4 Data

We embed our information provision experiment into a large-scale representative online survey of 3000 invididuals in Germany. The survey is quota-representative with respect to age, gender, educational background, and federal state. The survey field phase starts in November 2020 and is distributed to respondents by a professional survey company via an online panel.

The survey measures employed are related to the assessment of the general economic situation, beliefs about immigration, economic concerns about immigration, immigration policy preferences, preferences for redistribution, the COVID-19 crisis, and general political and social attitudes.

5 Analysis

In the following, we outline the different steps we aim to conduct in our empirical analysis.

5.1 Experimental balance

Before analyzing treatment effects, we conduct tests for experimental balance between experimental groups. These tests are based on between-subject t-tests. An alternative approach to an assessment of experimental balance are normalized differences between groups, as introduced by Imbens (2015). Specifically, we aim to conduct balance tests on the following covariates:

- prior beliefs: share of foreigners / unemployment rate of foreigners / general unemployment rate

- concerns about immigration

- attitudes towards cultural diversity

- concerns about economic situation

- concerns about COVID-19 crisis

- news consumption

- risk and trust attitudes

- political attitude

- age group

- gender

- residence / Eastern and Western Germany

- education

- employment status

- household size and net income

- relationship status

- migration background and contact with foreigners

- population size of area of residence

5.2 Determinants and updating of prior beliefs

As a first step, we explore which determinants of respondents' characteristics are associated with biased beliefs about immigration. For that purpose, we estimate the following equation:

$$b_i = \delta_0 + \delta^T X_i + \varepsilon_i, \tag{1}$$

where b_i represents biases in beliefs about the share and the unemployment rate, respectively, X_i contains socio-demographic and attitudinal controls from the balance tests, and ε_i is the error term.

We also investigate whether respondents who receive information on the share and/or the unemployment rate of foreigners update their beliefs after the receipt of information. Specifically, we compare their prior and posterior beliefs by means of within-subject t-tests.

5.3 Global effects of information provision

To investigate the global, i.e. full-sample effects of our information treatments in our main experiment, we estimate the following equation which compares our outcome variables across treatment arms given exogeneity of the treatments:

$$y_i = \gamma_0 + \gamma_1 A_i + \gamma_2 B_i + \gamma_3 C_i + \varepsilon_i, \tag{2}$$

where y_i represents the outcome variable, A_i, B_i, and C_i are treatment indicators for the different treatment arms, and ε_i is the error term.

5.4 Two-stage analysis of belief updating

The analysis of global effects represents a reduced-form approach to examining treatment effects. The underlying assumption is that respondents first update their beliefs according to the information received, and subsequently change their attitudes. Hence, we also aim to evaluate sequential treatment effects by means of a 2SLS strategy similar to Lergetporer et al. (2017, 2020).

We therefore combine prior beliefs for those groups who did not receive the true values with posterior beliefs of respondents who did receive information on the respective immigration statistic. We regress this variable on our treatment indicators, representing the first stage of our 2SLS approach:

$$S_i = \alpha_0 + \alpha_1 A_i + \alpha_2 B_i + \alpha_3 C_i + \varepsilon_i \tag{3a}$$

$$U_i = \beta_0 + \beta_1 A_i + \beta_2 B_i + \beta_3 C_i + \varepsilon_i, \tag{3b}$$

where S_i and U_i represent the combined variables on prior and posterior beliefs about the share and the unemployment rate, respectively, A_i, B_i, and C_i are treatment indicators for the respective treatment arms, and ε_i is the error term.

We then proceed to estimate the following second-stage equation:

$$y_i = \gamma_0 + \gamma_1^{IV}\widehat{S_i} + \gamma_2^{IV}\widehat{U_i} + \varepsilon_i, \tag{4}$$

where y_i represents the outcome variable, $\widehat{S_i}$ and $\widehat{U_i}$ are the instrumented beliefs about the share and the unemployment rate, respectively, and ε_i is the error term.

Our information treatments are designed to specifically affect beliefs of respondents about the respective statistic(s) provided. In the context of our 2SLS strategy we therefore cautiously assume the exclusion restriction to hold, i.e. that our information treatments – if they do relevantly affect respondents' beliefs about immigration statistics – affect our outcome variables exclusively only via their effects on these beliefs.

5.5 Priming experiment

To examine effects of priming respondents to think about the COVID-19 crisis, we estimate the following equation for respondents in the passive control group and the priming treatment:

$$y_i = \theta_0 + \theta_1 P_i + \varepsilon_i, \tag{5}$$

where y_i represents the outcome variable, P_i is a treatment indicator for the priming treatment, and ε_i is the error term.

5.6 Treatment effect heterogeneity

We suspect that treatment effects vary across different subgroups of respondents. To analyze this potential treatment effect heterogeneity, we follow a systematic approach based on a machine learning algorithm put forward by Athey and Imbens (2016, 2019) called causal tree analysis.

In general, this algorithm aims to uncover treatment effect heterogeneity by means of a recursive approach. Specifically, the data are sequentially partitioned into a structure of subsamples using the mean-squared error (MSE) of the conditional average treatment effect (CATE) (Athey

and Imbens 2016). The causal tree which is generated by this algorithm can then be visually displayed in a flow diagram. We supply the attitudinal and sociodemographic covariates used in our balance tests to evaluate the CATE on subgroups of at least 50 respondents.

Based on the resulting causal tree, we will then reestimate our main specfication in equation (2) and the priming specification in equation (5) for the most relevant subgroups in terms of CATE. In addition to the evaluation based on the causal tree, we specifically consider the analysis of potential differences for the subgroups of respondents living in Eastern and Western Germany and in relation to concerns about the COVID-19 crisis.

5.7 Further strategies for analysis

Since our experimental design involves multiple treatment arms and outcome variables, we discuss in the following further related strategies for our empirical analysis.

5.7.1 Adressing potential imbalances

In case the realized experimental groups exert imbalances despite randomization for some covariates, we will control for these imbalances in terms of observables in our estimation specifications.

5.7.2 Pooling of treatment arms

Given that our treatment arms build on each other in terms of the quantity and type of information provided to respondents, we consider pooling strategies for our main experiment to further concentrate on the dimension of either the share or the unemployment rate of foreigners, especially in the context of the evaluation of treatment effect heterogeneity.

Specifically, we consider pooling of treatment arms A and C as well as B and C. This pooling strategy may also be relevant to preserve statistical power for subsample analysis on treatment effect heterogeneity as outlined in section 5.6. Based on the results of our priming experiment, we also consider pooling strategies concerning the passive control group and the priming treatment arm.

5.7.3 Indices

The related nature of our outcome variables allows for the construction of indice measures, e.g. in terms of an additive index on welfare state and labor market concerns. This strategy may again be well-suited to be applied in the context of the evaluation of heterogeneity in treatment effects across subgroups of the population.

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