Journal Pre-proof

Does ethnic heterogeneity decrease workers' effort in the presence of income redistribution? An experimental analysis

Christoph Schüttr, David Pipker, Lena Detlefsenr, Gianluca Grimalda

PII: S0176-2680(23)00084-8
DOI: https://doi.org/10.1016/j.ejpoleco.2023.102440
Reference: POLECO 102440

To appear in: *European Journal of Political Economy*

Received date : 15 June 2022
Revised date : 15 May 2023
Accepted date : 6 July 2023

Please cite this article as: C. Schüttr, D. Pipker, L. Detlefsenr et al., Does ethnic heterogeneity decrease workers' effort in the presence of income redistribution? An experimental analysis. *European Journal of Political Economy* (2023), doi: https://doi.org/10.1016/j.ejpoleco.2023.102440.

Does ethnic heterogeneity decrease workers' effort in the presence of income redistribution? An experimental analysis

Christoph Schütt Ⓡ David Pipke Ⓡ Lena Detlefsen Ⓡ Gianluca Grimalda*

May 5, 2023

Abstract

Ethnic discrimination is ubiquitous, and it has been shown to exert adverse effects on income redistribution. The reason is that a country's ethnic majority, if richer than the average, may be unwilling to transfer resources to the country's ethnic minorities if poorer than the average. A yet untested mechanism is that a country's ethnic majority may reduce their work effort knowing that their income will finance redistribution to ethnic minorities. We test for this mechanism experimentally in triadic interactions. A German citizen acting as a worker is randomly matched with a recipient who can be another German, an economic migrant, or an asylum seeker in Germany. Workers know that another German citizen may transfer part of their earnings to the recipient. The recipient does not exert any work effort. Even if the recipient's identity does not affect effort in the aggregate, social identity strongly moderates this relationship. Participants with a strong German identity, i.e., who report feeling close to other Germans, exert significantly less effort than other participants if the recipient is an asylum seeker. They also exert more effort when matched with a German recipient than an asylum seeker, while participants with a less strong German identity do the opposite. Moreover, participants with a strong German identity exert slightly more effort when matched with economic migrants than with asylum seekers, while others tend to do the opposite, albeit not reaching statistical significance. Workers' beliefs over the third

*The order of authors' names has been randomized using the AEA Author Randomization Tool (Confirmation code: 7515hDn59G8z). Schütt: Kiel Institute for the World Economy & Helmut-Schmidt-Universität / Universität der Bundeswehr Hamburg (christoph.schuett@ifw-kiel.de); Pipke: Kiel Institute for the World Economy (david.pipke@ifw-kiel.de); Detlefsen: Kiel Institute for the World Economy (lena.detlefsen@ifw-kiel.de); Grimalda: Kiel Institute for the World Economy (gianluca.grimalda@ifw-kiel.de). We are very grateful for helpful and constructive comments from Erzo F.P. Luttmer. The Mercator Foundation has funded this study as part of the Mercator Dialogue on Asylum and Migration (MEDAM). We thank Esther Ademmer for her contributions to the study's design.

party's redistribution rate exhibit only limited mediating effects on such results and are generally inaccurate.

JEL Codes: C91, H23, I31, J15, J30

Keywords: Redistribution, Discrimination, Taxes, Beliefs, Real effort, Experiment

Highlights

- Our study quantifies productivity when the recipient of redistribution is either an immigrant or a co-national.
- We find that workers with a strong national identity tend to exhibit lower productivity when recipients are asylum seekers, whereas workers without a strong national identity display the opposite behavior.
- The observed results are only marginally mediated by workers' beliefs about the redistribution rate, suggesting that ingroup favoritism may be driven by taste-based factors.
- Workers possessing a strong national identity significantly overestimate the redistribution rate to the recipient they discriminate against.

Declarations of interest: none

Data availability statement: Dataset and analysis codes are available at https://osf.io/sj2qx/?view_only=3d87a0e65c33444796a7b26c1e8e639f.

1 Introduction

After the influential work by Alesina and Glaeser (2004), the argument that increased ethnic heterogeneity and fractionalization may reduce support for income redistribution and thus challenge the viability of generous welfare states gained prominence. The reason is that ethnic minorities, such as Blacks or Hispanics in the US, typically occupy the lower tiers of the income distribution. Ethnic majorities, such as Whites in the US, who are motivated by aversion toward ethnic minorities, will thus demand low redistribution to provide little benefit to ethnic minorities. The greater ethnic homogeneity in Europe compared to the US thus partly explains the higher redistribution rates in the former than the latter. This thesis has received extensive empirical support (Luttmer, 2001; Alesina and La Ferrara, 2005; Alesina and Giuliano, 2011; Alesina et al., 2021c), not least by carrying out online-survey experiments (Alesina et al., 2022, 2021a) or by exploiting exogenous migrant placement policies (Dahlberg et al., 2012).[1] Besides, another strand of the literature finds ethnic diversity associated with lower quantity and quality of public goods provision (Alesina et al., 1999; Algan et al., 2016; Tabellini, 2020). One of the leading explanations proposed for these findings is ingroup favoritism or group loyalty effects (Luttmer, 2001). The rationale behind this concept is that people may attach a higher value to the well-being of their "ingroup," the group to which they feel connected, as compared to others (the "outgroup") (Tajfel et al., 1971; Brewer, 1999). Group loyalty effects have been extensively studied in the (socio-)psychological and recent economic literature (Balliet et al., 2014; Romano et al., 2017, 2021).[2] However, the literature remains largely silent on whether outgroup members among potential welfare state beneficiaries may even lead to a withdrawal of working effort by the native population.

Our paper aims to fill this gap in the literature. We report evidence from an experiment testing whether people's work commitment in a real-effort task is affected by the migration status of potential beneficiaries of earning redistribution. Participants from a University student pool (the "workers") of German citizenship could earn money depending on their performance in a real-effort task (Gill and Prowse, 2012). Participants were informed that a third-party allocator (the "allocator" in the following) would be able to transfer part of the participants' earnings to another person (the "recipient"). The allocator could choose any tax rate from 0% (in which case the initial earnings would be earned in full by the worker) to 100% (in which case all of the worker's earnings would be transferred to the recipient). This setting mimics a vastly simplified - and rather extreme at the high end of redistribution - version of a welfare state. The experimental design is similar to the first phases in Cappelen et al. (2013) and Almås et al. (2020). Each participant performed a slider task (Gill and Prowse, 2012) for three rounds. In a between-subject design, we used three treatments varying whether the

[1] See the survey of the literature by Stichnoth and van der Straeten (2013).
[2] See Anderson et al. (2006) and Cooper and Kagel (2016) for reviews of the literature.

recipient was (i) a German citizen, (ii) an asylum seeker, or (iii) an economic migrant. In this non-strategic interaction, the recipient could not influence the worker's payoffs. Hence, the design allows studying preference-based group effects independently of beliefs about whether actions could be reciprocated in the future.[3]

The optimal strategy for a self-interested worker is always to perform the highest possible effort compatible with the marginal disutility of effort - which should not vary over treatments. We hypothesized, nevertheless, that workers would be more inclined to exert higher effort when the recipient is a fellow country person rather than an immigrant (Hypothesis 1). This would be the case if ingroup favoritism (based on nationality) applied to effort levels similar to what has been observed in prior research (see literature cited above). Our second hypothesis was that the higher the expected tax rate, the lower workers' effort (Hypothesis 2).

While our analyses do not reveal any group effects on task performance in the aggregate, we find results consistent with our hypotheses after splitting the sample according to a simple measure of workers' identification with Germans, i.e., their *national identification*. This measure is based on a simple question where we asked participants to state how close they feel to Germans. We divide the sample into those who report feeling "very close" or "close" to Germans[4] ("*Close*" henceforth) and those who do not ("*Non-Close*" henceforth). As noted by Fong and Luttmer (2009), a question on subjective closeness is likely to be less prone to social desirability bias than other commonly used questions on racial or ethnic identification, where subjects might feel reluctant to reveal an aversion against a specific group of people. We find that *Close* participants exert significantly less effort than *Non-Close* participants if the recipient is an asylum seeker (significant at 5 percent). Moreover, *Close* participants exert slightly more effort when matched with a German recipient than an asylum seeker (significant at 10 percent), while *Non-Close* participants do the opposite (significant at 5 percent). Consistently, the difference of the difference is highly statistically significant (1 percent level). Moreover, *Close* and *Non-Close* participants also seem to differ in the way they treat economic migrants and asylum seekers. *Close* participants exert slightly more effort when matched with economic migrants than with asylum seekers (significant at 10 percent), while *Non-Close* participants tend to do the opposite (not significant at 10 percent). The difference of the difference is, in this case, significant at the 10 percent level. Contrary to Hypothesis 2, workers' beliefs over the degree of redistribution are not related to effort. Thus, our findings on the relationship between beliefs and effort seem to contradict our initial predictions, which were based on a conventional utility function. Although the striking ab-

[3]See Everett et al. (2015) for an extensive review on the role of beliefs and preferences in explaining prosocial behavior and Durrheim et al. (2016) for the role of expectations of ingroup reciprocity.

[4]We use the answer score to the question "How close are the following groups to you?" which could range from 1 "very close" to 5 "very distant". Groups were "People in your town", "Germans", "Europeans", and "People all over the world". See Appendix.

sence of a correlation between the expected tax rate and effort may suggest that participants valued their payoffs and the recipient's payoffs equally, we believe that there are alternative explanations. For example, research has demonstrated that productivity can be affected by changes in individuals' subjective moods (Oswald et al., 2015) or workplace partnerships (Falk and Ichino, 2006; Hedegaard and Tyran, 2018). Therefore, purely mentioning different identities for the participant's counterpart may affect individual productivity without any mediating effect by the tax rate. Additionally, it is worth considering that our study's measure of beliefs relies on only one data point and may have only imprecisely measured the intended construct. We discuss in the final section methodological issues relative to belief elicitation (see Section 4).

In any case, it is noticeable that *Close* and *Non-Close* participants expect relatively larger shares of their earnings to be redistributed toward an asylum seeker than to Germans. The belief that asylum seekers receive more transfers than German recipients is, however, incorrect. In fact, the related study (Grimalda et al., 2022) shows that allocators transfer significantly more to German recipients than to asylum seekers. Moreover, workers from the *Close* and the *Non-Close* group also overestimate the actual size of the transfers accruing to asylum seekers and economic migrants while underestimating those accruing to Germans. We show that beliefs about the share to be redistributed exhibit only minor mediating effects on effort differences within and between groups defined by their strength of self-reported identification with other Germans. Hence, those beliefs do not explain why, for instance, *Close* participants exert less effort than *Non-Close* participants if an asylum seeker is the recipient. Overall, our results entail that the discrimination effect regarding effort we find in the *Close* group primarily operates through lower levels of pure altruism toward asylum seekers, rather than being the product of statistical discrimination (Becker, 1971), where statistical discrimination in this setting entails a belief that the allocator will mostly favor redistribution toward asylum seekers. An alternative mechanism compatible with our results is that the perceived costs of effort are higher when the potential recipient is an asylum seeker in the *Close* group.[5]

From a broad perspective, our paper contributes to the vast literature shedding light on the relevance of ethnic diversity for preferences for redistribution (Alesina and Glaeser, 2004; Fong and Luttmer, 2009; Alesina and Giuliano, 2011; Alesina et al., 2021b,c, 2022) and public goods provision (Alesina et al., 1999; Algan et al., 2016; Tabellini, 2020). We add to this literature finding that people with a strong ingroup identification exert less effort if potential beneficiaries of the welfare system are from an outgroup than if they are from their ingroup. Our results extend those from Hedegaard and Tyran (2018) to a different context, who find that entrepreneurs prefer selecting workers from their nationality rather than from a different nationality even when the former has lower productivity than the latter, thus

[5]This interpretation was pointed out by an anonymous reviewer.

reducing their expected profits. Our study also contributes to the experimental literature on labor market relationships, which shows that productivity may be affected by transient mood and states of happiness (Oswald et al., 2015). Our paper is also closely related to the literature on self-image derived from membership in a social group (Tajfel et al., 1971; Turner et al., 1979; Tajfel, 1982), which has been extensively studied in social psychology and sociology (Tajfel, 1982; Brewer, 1999) before it was introduced to the economics literature by Akerlof and Kranton (2000). Various studies in the experimental-economic literature have documented group effects in dictator and two-person response games (Chen and Li, 2009; Ockenfels and Werner, 2014; Tanaka and Camerer, 2016; Abbink and Harris, 2019), coordination games (Goette et al., 2006; Charness et al., 2007; Charness and Rustichini, 2011; Guala et al., 2013), trust games (Hargreaves Heap and Zizzo, 2009; Slonim and Guillen, 2010; Falk and Zehnder, 2013), (third-party) punishment games (Bernhard et al., 2006; Goette et al., 2006; Abbink et al., 2010), contests (Abbink et al., 2010; Chakravarty et al., 2016) and variants of public goods games (Tajfel et al., 1993; Solow and Kirkwood, 2002; Eckel and Grossman, 2005; Croson et al., 2008; Charness et al., 2014) in which members of the ingroup are typically treated preferentially compared to outgroup members. These effects are generally found to be present in minimal groups that are assigned completely randomly (Tajfel et al., 1971; Chen and Li, 2009; Sutter, 2009) or artificially enhanced (e.g., by performing a common task such as puzzle-solving or identifying paintings) (Eckel and Grossman, 2005; Chen and Li, 2009; Hargreaves Heap and Zizzo, 2009; Rong et al., 2016) and as in naturally occurring groups that may be based on gender, ethnicity, religious affiliation, or membership in universities, organizations, or political parties (Fershtman and Gneezy, 2001; Bernhard et al., 2006; Goette et al., 2006; Croson et al., 2008; Charness and Rustichini, 2011; Falk and Zehnder, 2013; Ockenfels and Werner, 2014; Kranton and Sanders, 2017; Abbink and Harris, 2019). Our contribution to this literature is twofold, as our study involves naturally occurring groups, namely German citizens, asylum seekers, and economic migrants, in a situation akin to a welfare state. In addition, we methodologically extend the research on group effects, contributing to the growing literature that utilizes real-effort tasks in the lab (for a comparison of stated effort and real effort methods see Charness et al., 2018), instead of the formerly dominating approach using stated costly effort (Fehr et al., 1993, 1998). To the best of our knowledge, this is the first study on whether real effort in the laboratory depends on the characteristics of potential beneficiaries knowing that part of one's earnings is subject to redistribution.

The paper is structured as follows. Section 2 outlines the experimental design and the theoretical background. Section 3 presents the results. Section 4 discusses the findings and concludes.

2 Experimental design and theoretical background

The experiment took place during ten sessions in the laboratory for experimental economics at the University of Kiel. Four sessions in the same laboratory took place in September and October 2019 and two sessions in January 2020, thus ensuring participants used the same technical devices in all sessions. All participants attended only one session.

The experiment discussed in this paper is part of a research project on preferences for redistribution for which hypotheses and analysis plans were pre-registered in the OSF Registries (available at https://osf.io/xj7tf). The pre-registered hypotheses pertain to a companion paper (Grimalda et al., 2022) which analyzes the choices of third-party allocators in a representative sample of the German population.[6] Participants in the current experiment acting as "workers" stated beliefs about the allocators' choices. This feature allows comparing participants' beliefs stated in the current experiment to actual behavior of third-party allocators in the companion paper. Even if we did not pre-register hypotheses (outlined below) for the experiment discussed in the present paper, we would view them as straightforward extensions of existing theories and evidence. They are ultimately in line with the project's overall hypotheses.

The sample comprises 172 students from the University of Kiel acting as workers. 86 participants identified as females, 85 as males, and one as non-binary. The mean age was 25.7 years.[7] The vast majority, 163 participants, was born in Germany, as were most of their parents (162 and 155 of the participants' mothers and fathers, respectively). Nine participants reported having dual citizenship besides their German nationality. Their political orientation, measured on an interval ranging from 1 (extremely left-wing) to 5 (extremely right-wing), has a distribution slightly skewed to the left from the center (mean = 2.5, SE = 0.04), as typical for a university student pool. Table 1 shows that the treatments were balanced concerning observable characteristics.

Task. — We used a variant of the widely used slider task, first introduced by Gill and Prowse (2012), which has recently been used in laboratory labor market experiments (Araujo et al., 2016; Chen and Schildberg-Hörisch, 2019; Gill and Prowse, 2019). After a general explanation, participants performed three rounds of the slider task. Participants were shown a screen with 50 sliders in a randomly determined initial position in each round. Each slider could be positioned between 0 and 100 (see Appendix for a screenshot). Sliders should be moved to their midpoint with the computer's mouse at 50. Participants could earn 5 Euros if they completed at least 25 out of 50 sliders, whereas earnings would be zero below this threshold, as described by equation 1. For each centered slider above the threshold, they could

[6] Thus, the current paper and the companion paper (Grimalda et al., 2022) analyze different datasets.

[7] We excluded one participant's observation from the analysis who did not center any slider during the three rounds, although she touched 31, 30 and 30 sliders, respectively. Our results are robust to including this observation when using the number of touched sliders as dependent variable.

Table 1: Balance Table

	Asylum seeker	German	Economic migrant	Total	F-test
Female	0.564	0.410	0.534	0.500	0.207
	(0.067)	(0.063)	(0.066)	(0.038)	
Age in years	26.164	25.508	25.483	25.707	0.684
	(0.663)	(0.600)	(0.511)	(0.341)	
Dual citizenship	0.073	0.033	0.052	0.052	0.626
	(0.035)	(0.023)	(0.029)	(0.017)	
Born in Germany	0.909	0.951	0.983	0.948	0.190
	(0.039)	(0.028)	(0.017)	(0.017)	
Political orientation	2.527	2.508	2.569	2.534	0.854
	(0.068)	(0.086)	(0.074)	(0.044)	
Closeness	2.309	2.339	2.362	2.337	0.947
	(0.103)	(0.110)	(0.127)	(0.066)	

Notes: The table shows background characteristics for the participants in our experiment. Means and standard errors (in parentheses) reported. "Female" is the average share of females. "Age in years" is the average age in years. "Dual citizenship" is the share of participants holding a dual citizenship. "Born in Germany" is the share of participants born in Germany. "Political orientation" is ranging from 1 (very left) to 5 (very right). "Closeness" is a measure of closeness to Germans, ranging from 1 (very close) to 5 (very distant). The last column reports p-values from an F-test of joint significance in a regression of background characteristics on treatment indicators.

receive additional 20 Cents such that earnings m were capped at 10 Euros.[8] Participants were told that they would be paid according to their performance in a randomly chosen round, determining their payoff. Hence, the earnings maximizing strategy was exerting the highest possible effort in each round.

$$m = \begin{cases} 0 & e < 25 \\ (e - 25) \cdot 0.2 + 5 & e \geqq 25 \end{cases} \tag{1}$$

Treatments. — Before performing the task, we informed participants (the "workers") that their final payoffs would, in addition to their performance, also depend on the choice made by a third person (the "allocator"). The allocator could redistribute earnings (shares between 0 and 100 percent in steps of 20 percent) from the workers to another person (the "recipient"). The experimental design is similar to the situation faced by "stakeholders" and "workers"

[8]In the first "pilot" data collection session, the payoff-determining rule differed from the nine subsequent sessions. Participants in the first session received 5 Euros when completing at least 25 sliders, with no piece rate for additional sliders. Furthermore, beliefs about the redistribution choice by the third-party allocator were not elicited in percentage terms but in absolute values between 1 and 5 Euros in this first session. We decided to include the session for the main analysis as the results are consistent with the other sessions. To account for the difference, regressions in Section 3 contain an indicator variable as a control marking first session's observations. In the Appendix (see Table B.7), we further document that our main results are robust to excluding data from the first session.

during the first phases of the experiments by Cappelen et al. (2013) and Almås et al. (2020). Utilizing a non-strategic interaction in which the recipient has no possibility to react to the worker's behavior allows studying workers' preferences independently from belief-based group effects, which could originate from repeated game strategies (Everett et al., 2015).

Subjects were randomly assigned to one out of three possible treatment conditions in a between-subject design. In each of the three conditions, we varied the recipient's background. The recipient was either (i) a German citizen, (ii) an asylum seeker, or (iii) an economic migrant (the exact wording was "migrant for economic reasons"). The allocator was always described as a German citizen. Thus, the allocator belonged to what may be presumed to represent the subject's "ingroup" in the current context. After each round, we elicited workers' beliefs about the tax chosen by the third-party allocator. The tax rate determined the proportion of workers' earnings allocated to the recipient. Our decision to introduce uncertainty regarding the allocators' strategy was a design choice informed by the pre-registered related experiment (Grimalda et al., 2022), which focused on the allocators' redistribution choices. However, the design choice allows for comparisons between beliefs (from the present experiment) and actual tax rates (from the related experiment), as provided in Subsection 3.2.2. To encourage accurate belief reporting, we offered an additional 50 Euro cents as an incentive for correctly predicting the tax rate.

Furthermore, we manipulated the efficiency of the redistribution mechanism, consistent with the approach taken for allocator decisions. In the first round, the efficiency factor was consistently set to one, meaning that participants knew the allocator could transfer earnings directly from them to the recipient at a one-to-one ratio. In the second and third rounds, the order of the efficiency factor was randomized, with each Euro transferred from the worker to the recipient either doubled (factor 2) or halved (factor 0.5). This efficiency manipulation allowed us to examine how individuals balance fairness and efficiency considerations in their preferences (Cappelen et al., 2013; Durante et al., 2014).

Theoretical background. — To guide our analysis of workers' behavior, we assume a simple utility function (equation 2) of the following type.

$$U = m(e) \cdot (1 - t^e) - c(e) + \theta_i \cdot m(e) \cdot t^e \tag{2}$$

Agents are assumed to derive utility from their expected earnings $m(e)\cdot(1-t^e)$, wherein t^e is the expected share to be redistributed (the "tax rate"), minus their costs of providing effort $c(e)$. Furthermore, they are assumed to have social preferences weighted by $\theta_i \leqq 1$ towards the recipient, such that exerting effort to benefit the recipient may generate additional utility (Ariely et al., 2008). The index i identifies the three possible identities of recipients: $i = \{G, E, A\}$, where G identifies German recipients, E economic migrants, and A asylum seekers. Since ingroup favoritism appears to be a widespread determinant of allocation decisions

(Luttmer, 2001; Fershtman and Gneezy, 2001; Chen and Li, 2009; Fong and Luttmer, 2011; Romano et al., 2017), we expect that $\theta_G > \theta_E$ and $\theta_G > \theta_A$, i.e., that workers (who are of identity *G*) discriminate against recipients from outgroups relative to their national ingroup. Note that ingroup favoritism, or, to frame it differently, discrimination may be the result of ingroup love ($\theta_G > 0$ in this case), outgroup hate ($\theta_A < 0$ or $\theta_E < 0$), or a combination of the two (Brewer, 1999). However, to determine whether discrimination is based on ingroup love or outgroup hate (Brewer, 1999; Abbink and Harris, 2019) is outside the scope of our study. A clarification of the coefficients' signs, i.e., whether $\theta_G > 0$, or $\theta_A < 0$ (or $\theta_E < 0$), or both, would demand treatments to test whether favoritism for co-nationals (foreigners) is higher (lower) than toward a non-identified counterpart (a group devoid of national identification). In this paper, we instead solely focus on analyzing whether workers discriminate by exerting different levels of effort with respect to the between-subject variation of the identity of the potential recipient.

It is challenging to hypothesize regarding the relative value of θ_E and θ_A. On the one hand, it is plausible that asylum seekers suffer less discrimination than economic migrants because they might be viewed as needier or deserving compensation for their past traumatic experiences (Konow, 2000; Engel, 2011; Nicklisch and Paetzel, 2020). Alternatively, participants might simply value redistribution higher to recipients who presumably have relatively lower incomes under the assumption of decreasing marginal utility of income. On the other hand, economic immigrants may be seen more favorably than asylum seekers for their availability to work (Bansak et al., 2016). In the lack of any solid theoretical argument going in one direction or the other, we posit the following ordering in equation 3.

$$\theta_G > \theta_E = \theta_A \tag{3}$$

We assume an invertible cost function $c(e)$ fulfilling the regularity conditions $c'(e) > 0$, $c''(e) > 0$ and $\lim_{e\to\infty} c(e) = \infty$.

$$e^* = \begin{cases} c'^{-1}[0.2 \cdot (1 - t^e + \theta \cdot t^e)] & e^* > 25 \\ 0 & e^* \leq 25 \end{cases} \tag{4}$$

The optimal effort level e^* depends negatively on the expected tax rate and positively on θ_i in case of an interior solution, considering the payoff determining mechanism. Moreover, suppose the social preferences parameter θ_i towards potential beneficiaries varies with the recipient's identity (German, asylum seeker, or economic migrant) due to group identity effects. In that case, we should observe differences in exerted effort across treatments. Hence, the above simple model leads to two main hypotheses.

- *Hypothesis 1:* Due to ingroup favoritism, we expected effort levels to be higher if the recipient was a member of participants' ingroup (German citizen) than when the

recipient was an asylum seeker or an economic migrant.

- *Hypothesis 2:* We expected that the larger the beliefs about the rate to be imposed by the allocator, the lower the exerted effort.

In the following section, we analyze the experimental data[9].

3 Results

3.1 Descriptive results

Table 2 provides summary statistics[10] of the number of centered sliders as well as of the beliefs about tax rates to be imposed by the third-person allocator. Figure 1 illustrates the average number of centered sliders and their corresponding standard errors based on the communicated recipient type. The figure also presents the mean number of centered sliders for each recipient category in relation to participants' self-reported identification with the objective ingroup of (other) Germans. Cross symbols represent the mean values for participants who expressed a close or very close connection to (other) Germans, while circle symbols indicate the respective means for individuals who reported feeling neutral or distant from other Germans.

On average, participants completed 39 sliders within each 2-minute period across all three treatments and rounds. We observed significant learning effects in all treatments, as the average number of centered sliders increased from 36.2 in the first round to 41.4 in the third round ($p < 0.001$, two-sided t-test). There were 172 observations in the first round, and 161 in both the second and third rounds. Owing to technical issues, the sequencing of rounds for observations from the last two laboratory sessions could not be ascertained, and inaccurate data regarding the tax rate beliefs of 22 participants in the second laboratory session were obtained. Therefore, we restricted our analysis to the first round of these final two sessions, in which the efficiency factor was consistently equal to one, and considered the beliefs from the impacted session as missing data.[11]

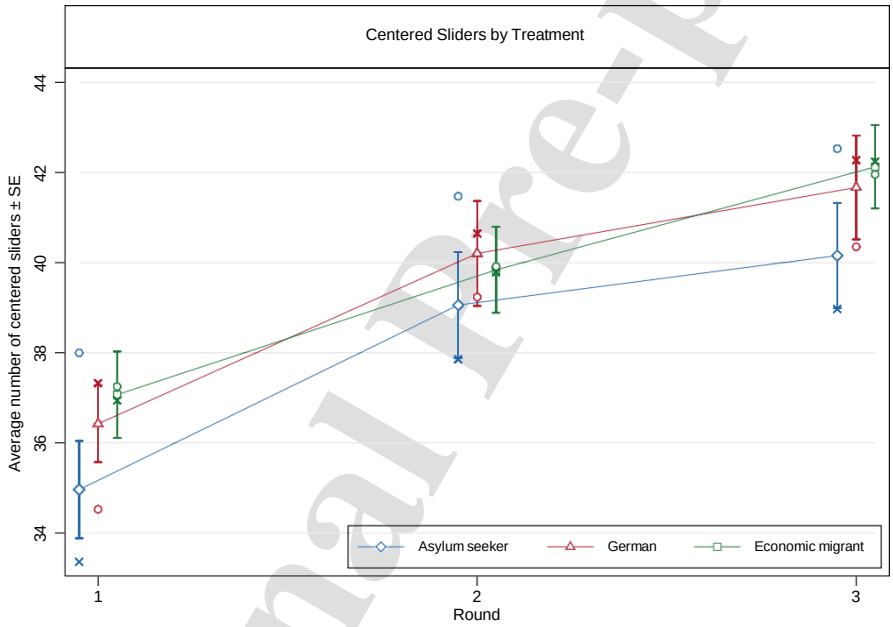
A preliminary examination of the average number of completed sliders in Table 2 (also illustrated in Figure 1) reveals only minor variations across the three treatments, suggesting that group identity has a relatively weak effect on the average performance. The mean number of centered sliders across all rounds is 37.98 when the recipient is an asylum seeker, 39.34 when the recipient is a German citizen, and 40.73 when the recipient is an economic migrant.

[9]The dataset and code are stored in the OSF repository and provided to reviewers for the purpose of replication at https://osf.io/sj2qx/?view_only=3d87a0e65c33444796a7b26c1e8e639f.

[10]More detailed summary statistics are provided in the Appendix Table B.11.

[11]However, results are qualitatively similar when including the erroneous beliefs data from this session.

Figure 1: Effort by Recipient for each Round



Note: This figure shows mean number of centered sliders ±1*SE by round of experiment. Crosses (circles) show the mean number of centered sliders for the subgroup of people reporting to be close (neutral or distant) to Germans in each round.

Table 2: Centered Sliders and Tax Beliefs by Round and Efficiency

	By round				By efficiency factor	
Centered sliders	Round 1	Round 2	Round 3	All rounds	2x	0.5x
Asylum seeker	34.96	39.06	40.16	37.98	39.67	39.55
	(1.08)	(1.18)	(1.17)	(0.68)	(1.20)	(1.15)
Obs.	55	51	51	157	51	51
German	36.42	40.20	41.67	39.34	40.37	41.50
	(0.85)	(1.16)	(1.15)	(0.63)	(1.19)	(1.13)
Obs.	59	54	54	167	54	54
Economic migrant	36.44	39.84	42.13	39.65	40.73	41.23
	(1.13)	(0.95)	(0.93)	(0.57)	(0.93)	(0.97)
Obs.	58	56	56	170	56	56
All recipients	36.17	39.71	41.35	39.01	40.27	40.79
	(0.56)	(0.63)	(0.62)	(0.36)	(0.64)	(0.62)
Obs.	172	161	161	494	161	161
Beliefs about tax rate	Round 1	Round 2	Round 3	All rounds	2x	0.5x
Asylum seeker	51.11	52.68	46.83	50.24	43.41	56.10
	(3.02)	(3.94)	(4.05)	(2.11)	(4.13)	(3.64)
Obs.	45	41	41	127	41	41
German	39.63	42.04	42.45	41.32	35.51	48.98
	(2.33)	(3.41)	(3.23)	(1.72)	(3.31)	(3.03)
Obs.	54	49	49	152	49	49
Economic migrant	43.53	46.53	46.12	45.37	37.96	54.69
	(2.84)	(2.94)	(3.51)	(1.78)	(2.87)	(3.13)
Obs.	51	49	49	149	49	49
All recipients	44.40	46.76	45.04	45.37	38.71	53.09
	(1.60)	(1.99)	(2.05)	(1.08)	(1.97)	(1.88)
Obs.	150	139	139	428	139	139

Notes: The table shows means and standard errors (in parentheses) for centered sliders and beliefs about taxes by treatment, round and efficiency factor. The efficiency factor always equals one in the first round.

More pronounced differences between treatments emerge when examining participants' beliefs about the tax rate. On average, participants expected a tax rate of 50.24% when the recipient is an asylum seeker, 41.32% when the recipient is a German citizen, and 45.37% for economic migrants. Moreover, expected tax rates were noticeably higher when the efficiency factor of the underlying redistribution mechanism was lower. Averaging across all treatment conditions, participants anticipated a tax rate of 38.71% for the doubling factor and 53.09% for the transfer-halving factor.

3.2 Regression results

To provide a quantitative assessment of the participants' behavior, we fit a random-effects Tobit model for panel data. Equation 5 describes the regression model in its base form. The Tobit model accounts for censoring in the latent dependent variable y_{it}^{*}. In this context, using the number of completed sliders as dependent variable, the latent variable may be interpreted as capturing the propensity to exert effort, or the desired level of effort. The effort variable is censored from below at 0 and above at 50. Beliefs about taxes are censored from below at 0 and above at 100. α is the intercept, c' is a vector of controls, and u_{it} is the error term.

$$y_{it}^{*} = \alpha + \beta_{GER} \cdot GER + \beta_{ECON} \cdot ECON + \sum_{t=1}^{2} \delta_t \cdot r_t + \gamma \cdot DOUBLE + c'\eta + u_{it} \qquad (5)$$

The regression model allows quantifying the treatment effects, i.e., the effect of varying recipient identity (asylum seeker, German citizen, economic migrant), as well as to control for learning and individual-level variation. β_{GER} and β_{ECON} are regression coefficients for the treatment indicators, with the recipient being an asylum seeker serving as the base category. Because the treatment variables are time-invariant, we cannot use a fixed-effects model. The regressions include indicators for the second and third round ($\sum_{t=1}^{2} \delta_t \cdot r_t$) to account for learning effects. *DOUBLE* is an indicator variable for the transfer-doubling efficiency factor.

Without violating the rank condition, we can either include dummies for the second and the third round and one of the efficiency factors (either doubling or one half) or for both efficiency factors but only for one of the rounds. With the number of centered sliders as the outcome variable, the round dummies are highly significant and statistically different from each other according to a Wald test ($p < 0.001$). In contrast, coefficients for efficiency factors in unreported regressions do not reach statistical significance. The opposite holds for beliefs about the tax rates imposed by the allocator as the dependent variable. We thus included round indicators in the effort regressions and efficiency factor indicators in the case of the beliefs regressions. Estimating a pooled OLS regression with standard errors clustered at

the individual level leads qualitatively to the same results as the Tobit model showing only minor differences in standard errors. The following subsections discuss the results concerning exerted effort and elicited beliefs about tax rates based on the Tobit model for panel data.

3.2.1 Effort

The first three columns of Table 3 show regression results in which the number of centered sliders serves as the dependent variable. Column (3) shows results from a regression where we added interactions between the treatment indicators and the variable *Close*, which is a simple measure of subjective identification with the (in-)group of (other) Germans. Concretely, the variable *Close* is equal to 1 if a subject stated to feel close or very close to (other) Germans (N = 110), and it is 0 if a subject placed themselves as neutral, distant, or very distant (N = 62). Figure 2 shows the main results concerning the between- and within-group comparisons, where we contrast participants based on their reported closeness to other Germans.

Aggregate results. —Indicator variables for the second and third rounds turn out to be positive, with point estimates of about 3.9 and 5.7 relative to the first period. These indicate the presence of learning effects that are statistically highly significant ($p < 0.001$). Gender has a statistically significant effect, as females completed roughly six sliders ($p < 0.001$, Wald test) less than male participants. The efficiency of the redistribution mechanism shows no significant effect on effort. The Tobit regression reveals no treatment effects from the recipient's identity in the aggregate, as coefficients on the recipient's characteristics are not significantly different from zero (first column of Table 3). Participants complete roughly one slider less when Person 2 is German than when she is an economic migrant ($p = 0.443$), and 0.25 sliders more when Person 2 is German than when Person 2 is an asylum seeker ($p = 0.851$). We thus do not observe any bias based on objective affiliation to their ingroup, given that all our subjects were students of German citizenship.

Moreover, regression results from column (2) of 3 show that beliefs about the share to be redistributed do not show statistically significant effects on exerted effort. This result is unexpected since it may suggest that participants equally value their payoffs and transfers to potential recipients. However, we discuss further explanations in the final section. Looking at raw correlations, average beliefs about the share to be redistributed by the third-party allocator over the three rounds and average exerted effort (centered sliders) are virtually uncorrelated (Pearson's $r = 0.026$, $p = 0.757$). Moreover, the same result holds in each round separately, ruling out the possibility that learning effects may have confounded the relationship (Pearson's $r = -0.020$, 0.050, and 0.031; $p = 0.806$, 0.559, 0.721, for rounds 1-3, respectively).

Heterogeneity within groups defined by their closeness. — The picture regarding ingroup favoritism changes if we consider the degree of participant's closeness to German identity.

Table 3: Main Results: Tobit Regressions

	(1) Effort	(2) Effort	(3) Effort	(4) Beliefs	(5) Beliefs
German	0.249	0.405	-4.611**	-9.869***	-8.634
	(1.32)	(1.43)	(2.26)	(3.19)	(5.76)
Economic migrant	1.251	1.033	-1.929	-5.184	-2.205
	(1.32)	(1.44)	(2.12)	(3.19)	(5.52)
Round 2	3.902****	3.838****	3.896****		
	(0.47)	(0.52)	(0.47)		
Round 3	5.691****	5.625****	5.688****	-1.321	-1.322
	(0.46)	(0.52)	(0.46)	(2.50)	(2.50)
Female	-5.863****	-6.158****	-5.815****	-0.795	-0.685
	(1.10)	(1.17)	(1.08)	(2.62)	(2.62)
2x Efficiency	-0.452	-0.515	-0.45	-5.218*	-5.219*
	(0.42)	(0.49)	(0.42)	(2.81)	(2.80)
0.5x Efficiency				9.272****	9.273****
				(2.78)	(2.78)
Belief about tax		0.002			
		(0.01)			
Close			-4.277**		1.653
			(1.96)		(5.14)
German × Close			7.284***		-1.697
			(2.76)		(6.95)
Economic migrant × Close			4.903*		-4.713
			(2.68)		(6.84)

Table 3: Main Results: Tobit Regressions

	(1) Effort	(2) Effort	(3) Effort	(4) Beliefs	(5) Beliefs
Constant	42.414****	42.258****	45.642****	63.010****	62.046****
	(2.67)	(3.00)	(2.94)	(6.68)	(7.47)
Obs.	494	428	494	428	428
Right-censored	46	35	46	24	24
Left-censored	0	0	0	9	9
No. of panels	172	150	172	150	150
Log-likelihood	-1437.492	-1263.378	-1433.924	-1836.75	-1836.465
Hypothesis tests (p-values)					
Round 2 = Round 3	0.000	0.000	0.000	.	.
2x Eff. = 0.5x Eff.	.	.	.	0.000	0.000
German × Close = 0	.	.	0.008	.	0.807
Economic migrant × Close = 0	.	.	0.067	.	0.491
German = 0	0.851	0.776	0.041	0.002	0.134
Economic migrant = 0	0.343	0.472	0.363	0.105	0.690
German = Economic migrant	0.443	0.649	0.209	0.126	0.205
Close = 0	.	.	0.029	.	0.748
Close + German × Close = 0	.	.	0.124	.	0.992
Close + Economic migrant × Close = 0	.	.	0.733	.	0.491
German + German × Close = 0	.	.	0.092	.	0.007
Economic migrant + Economic migrant × Close = 0	.	.	0.070	.	0.082
Economic migrant (1 + Close) = German (1 + Close)	.	.	0.853	.	0.378

Table 3: Main Results: Tobit Regressions

	(1) Effort	(2) Effort	(3) Effort	(4) Beliefs	(5) Beliefs

Notes: The table shows panel data regression results from a Tobit random-effects model accounting for left-censoring at 0 and right-censoring at 50 for the first three columns, and at 100 for the fourth and the fifth column. Standard errors (OIM) in parentheses. p(Prob > Chi2) < 0.001 for each regression in the table. * p < 0.1, ** p < 0.05, *** p < 0.01, **** p < 0.001. All regression include a control for self-reported political orientation and dummy variables for subjects with age larger or equal 30 years, for data from the first session, for data from the last two sessions (only data for the first round), and a dummy variable for little fun reported in the questionnaire during the task.

Participants who reported a strong identification with Germans are by 2.7 completed sliders less successful in the slider task when the recipient is an asylum seeker than when the recipient is German. This result statistically significant at the 10% level (p = 0.092, Wald test) in the whole sample. If we remove extreme outlier observations according to the Tukey's fences method, the difference remains statistically significant (p = 0.083) (see Appendix Table B.1). Participants with higher closeness to German identity complete also roughly 3 sliders more when the recipient is an economic migrant than when the recipient is an asylum seeker (p = 0.070). There are no significant differences in effort when the recipient is a German or an economic migrant in the group having a close identification with Germans (roughly 0.3 completed sliders more when the recipient is an economic migrant instead of a German, p = 0.853).

Conversely, participants without strong identification with Germans exert *lower* effort if the recipient is German compared to when she is an asylum seeker (difference = -4.6 sliders, p = 0.041). In addition, there is a tendency in this group to exert lower effort in the treatment where the recipient is an economic migrant relative to when the recipient is an asylum seeker, albeit not statistically significant (difference = -1.9 sliders, p = 0.363). The difference between the recipient being an economic migrant or a German does not reach statistical significance in the participants with a low identification (difference = 2.4 sliders, p = 0.209).

Heterogeneity between groups defined by their closeness. — Comparing the effort between groups defined by the strength of their identification with Germans, we can report the following results. Participants reporting a strong identification with other Germans exert significantly[12] less effort when the recipient is an asylum seeker than participants without a strong identification with Germans (difference = -4.3 sliders, p = 0.029). In addition, on average, effort is higher in the group of participants who identify with their ingroup when the recipient is a German citizen, as compared to those who reported no identification, albeit not statistically significant (difference = 3.0 sliders, p = 0.124, Wald test). There are no significant differences between groups defined by their reported closeness when the recipient is an economic migrant (difference = 0.6 sliders more among the *Close* participants, p = 0.733).

Differences-in-differences. — Finally, we can compare the differences in differences when the recipient is an asylum seeker versus when the recipient is either a German or an economic migrant between the groups defined by their identification with (other) Germans. Participants with a strong identification with Germans exert significantly more effort if the recipient is another German than when the recipient is an asylum seeker relative to the same difference among participants without a strong identification with Germans (difference = 7.3 sliders, p

[12]The p-value from a two-sided t-test accounting for unequal variances using the mean number of sliders over the three periods between those with and without a strong ingroup identification is p = 0.058.

= 0.008). When the recipient is an asylum seeker or an economic migrant, the difference in difference only reaches statistical significance at the 10 percent level (difference = 4.9 sliders, p = 0.067). Hence, consistent with previous results, the treatment effect of the recipient being a German or an economic migrant instead of an asylum seeker is positive among those with a solid self-reported identification with Germans relative to those without a strong level of identification.

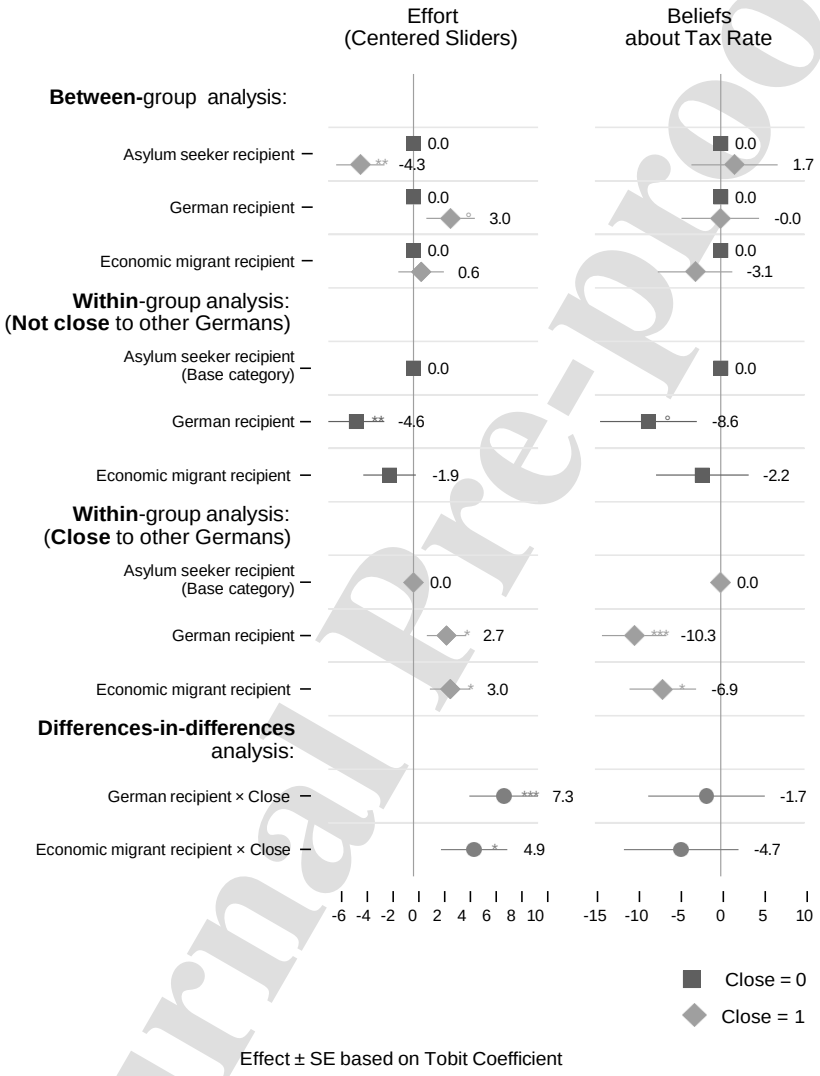
Views on outgroups. — We were unable to replicate the heterogeneity in treatment effects found in relation to participants' self-reported identification with Germans using PCA indices based on questions about views on immigrants in general, asylum seekers, and economic migrants (see Table B.3 in the Appendix). No statistically significant heterogeneity was observed when interacting treatment indicators with dummy variables equal to one if views on these groups, as captured by the PCA indices, were less favorable than the median value in the sample. Although the point estimates tend to suggest that unfavorable views about outgroups are associated with relatively greater effort when the recipient is a German citizen, this analysis lacks the statistical precision to reinforce the robustness of our earlier findings. Nevertheless, this result supports the interpretation that a survey question about closeness to a respondent's ingroup may be less susceptible to social desirability biases (see Fong and Luttmer, 2009). Conversely, respondents may be more hesitant to report negative attitudes or prejudices in questions about outgroups.

Robustness. — In Table B.5, we show regression results using the same models as in Table 3 with bootstrapped standard errors, yielding equivalent results. Similarly, OLS regressions in Table B.2 lead to the same conclusions. Table B.7 shows results omitting data from the first session. In Table B.6 in the Appendix, we further show that our main results regarding effort and differences between workers with and without strong identification with other Germans are robust to analyzing only data from the first round, where the efficiency factor was always equal to one. In contrast to part of the previous literature (Fershtman and Gneezy, 2001; Solow and Kirkwood, 2002; Croson et al., 2008), we do not find a differential strength of group loyalty effects along the gender dimension. There is no significant difference between females and males in the reaction to the treatments, while female participants generally performed slightly worse on the slider task, as can be seen in Appendix Table B.1. Thus, it is unlikely that the non-significantly larger share of females in the asylum seeker and economic migrant treatments relative to the treatment where the recipient was another German (F-test, see Table 1) drives our results.

3.2.2 Beliefs about tax rates

In columns (4) and (5) in Table 3, we show regression results with the expected share of participants' earnings that the allocator would redistribute as the dependent variable. Akin

Figure 2: Main Results: Between-group analysis and Within-group analysis



Note: This figure shows the main results based on the Tobit regressions. The dependent variable in the first (second) column is the number of centered sliders (beliefs about tax rate). In the first three rows, the results of the between-group comparison, i.e., between those who report feeling close and those who do not, are depicted. Those who do not feel close to other Germans serve as the base category. The following six rows show the differences within the groups based on their reported closeness to other Germans, whereby the recipient being an asylum seeker is the base category. The last two rows show the coefficients from the interaction between the Closeness indicator and the treatments for a German or an economic migrant recipient, which can be interpreted as the difference between the outcome in the asylum seeker treatment relative to the other two treatments between participants without and with strong identification with other Germans. (**, *, ˚) indicate two-sided p-values below 0.05, 0.1, and 0.2, respectively.

to the analysis of exerted effort, we interact treatment indicators with the variable Close, i.e., the dummy for self-reported identification with the ingroup (other Germans) in the fifth column of 3. As noted above, the regressions with beliefs as dependent variables do not contain an indicator for the second round, allowing us to control the transfer-halving efficiency factor. Apart from this adjustment, we use the equivalent right-hand-side variables as in the third column.

Aggregate results. — In contrast to findings concerning exerted effort, the efficiency factor plays a vital role in the tax rate beliefs. Participants, on average, expect a 5.2 percentage point smaller tax rate when the redistributed share of earnings would be doubled ($p = 0.063$). On the contrary, for an efficiency factor equal to 0.5, participants' tax beliefs are, on average, 9.3 percentage points higher relative to the base category ($p = 0.001$). Both effects are not only significantly different relative to the base category of a one-to-one transfer but also significantly different from each other ($p < 0.001$, Wald test). These findings are consistent with the idea that participants expected the allocator to be willing to transfer a minimum amount of money to the recipient. As a result, participants expected allocators to completely disregard efficiency concerns and transfer more when it was less efficient. Hence, the participants' average belief contrasts the prediction of economic theory and recent experimental findings (Krawczyk, 2010; Almås et al., 2020) that allocators may choose to redistribute less if redistribution involves a cost due to efficiency losses. In another experiment related to this project, Grimalda et al. (2022) analyze allocators' choices about the share to be redistributed from the workers to different types of recipients, involving 1807 participants from a quasi-representative sample of the German population. Remarkably, Grimalda et al. (2022) find that workers' expectations in the present experiment were qualitatively correct, as allocators transferred 16.6% more when the efficiency factor was 0.5 instead of one. Furthermore, the allocators transferred 5.6% more when the efficiency factor was two than when it was 0.5 - something that workers failed to anticipate, albeit the difference in expectations between these two cases is not significant. This pattern of preferences, which disregards efficiency concerns but seemingly aims to guarantee a minimum earning level to the recipient, is compatible with a Rawlsian or a "Boulding" social welfare function (Traub et al., 2005). Somewhat different from the analysis of effort which revealed no treatment effects in the aggregate, on average, we find that stated beliefs are significantly lower (difference = -9.9, $p = 0.002$) when the recipient is a German instead of an asylum seeker. Moreover, participants also expected smaller shares to be redistributed to economic migrant recipients than to asylum seekers, albeit not reaching statistical significance (difference = -5.2, $p = 0.105$) .

Heterogeneity within groups defined by their closeness. — Participants who reported to be close to Germans expected significantly lower tax rates when the recipient is either a German (difference = -10.3 percentage points, $p = 0.007$) or an economic migrant (difference = -6.9 percentage points, $p = 0.070$) in comparison with the base category of an asylum seeker

as the recipient. The difference in tax beliefs between the treatments when the recipient is a German or an economic migrant in this group does not reach statistical significance (difference = -3.4 percentage points lower expected tax rates when the recipient is a German, p = 0.378). Moreover, those participants who do not report to identify with Germans, also expected the allocator to impose slightly (but not statistically significantly) higher tax rates when the recipient was described either as an asylum seeker (difference = 8.6 percentage points, p = 0.134) or as an economic migrant (difference = 2.2 percentage points, p = 0.730), relative to the treatment when the recipient was a German.

Beliefs vs. allocators' actual choices. — The related experiment by Grimalda et al. (2022) analyzing the choices of third-party allocators applying to the workers from this experiment allows comparing the allocators' actual choices concerning recipients' identities with workers' beliefs in the current investigation. Allocators in this related experiment redistribute the most to German recipients (45.6 percent) followed by recipients that are asylum seekers (41.2 percent) and economic migrants (37.8 percent) (Grimalda et al., 2022). Hence, the beliefs of participants who reported feeling close to (other) Germans and those who did not report feeling close were incorrect concerning ordering the share to be redistributed to the three types of recipients. Both, participants with and without a strong German identity expected asylum seekers to benefit most from redistribution and German recipients to benefit the least. Economic migrants were expected to benefit less than asylum seekers. In contrast, the actual choices by allocators reveal that German recipients benefited considerably more than asylum seekers, and economic migrants benefited even less (Grimalda et al., 2022). In general, allocators in (Grimalda et al., 2022) discriminated across recipients at a similar rate to what workers in the present experiment expected (regarding the range of beliefs and actual redistribution rates). Furthermore, workers also correctly predicted that economic migrants benefit less than asylum seekers. However, they were vastly incorrect in predicting outgroup favoritism by the allocators, who treated Germans most favorably instead (i.e., an instance of ingroup favoritism).

Heterogeneity between groups defined by their closeness. — Unlike in the case of effort, there is no significant between-group heterogeneity concerning participants' identification with (other) Germans when we compare stated beliefs. Participants who reported feeling close to their ingroup of (other) Germans expect a only marginally larger share of their earnings to be redistributed when the recipient is an asylum seeker compared to those who did not report a strong identification (difference = 1.7 percentage points, p = 0.748). There are also no relevant differences between both groups' beliefs when the recipient is either a German (difference = -0.04 percentage points lower expectations among *Close* participants, p = 0.992) or an economic migrant (difference = -3.1 percentage points lower expectations among *Close* participants, p = 0.491).

Differences-in-differences. — We also looked at the differences in differences in beliefs

between groups defined by their identification with Germans. Participants with a strong identification with Germans relative to those without solid identification with Germans expect slightly lower tax rates when the recipient is a German compared to when the recipient is an asylum seeker (difference = -1.7 percentage points, p = 0.807). The same applies to the treatments where the recipient is an economic migrant instead of an asylum seeker (difference = -4.7 percentage points, p = 0.491).

Similar to the case of effort, our results regarding beliefs are robust to using bootstrapped standard errors, OLS regressions, omitting data from the first session, and restricting data to the first round where the efficiency factor was always equal to one (see Tables B.5, B.7, and B.6 in the Online Appendix).

3.2.3 Taste-based or belief-driven discrimination

In our framework, we consider two possible explanations for participants with strong identification with Germans exerting more effort when the ingroup (other Germans) benefits relative to the outgroups (asylum seekers or economic migrants). The observed behavior could be attributed to taste-based discrimination, expectations about the share of earnings the third-party allocator would transfer to the recipient, or a combination of both factors. Thereby, we understand taste-based discrimination as a form of discrimination rooted in an individual's preferences or prejudices (see Becker's (1971) work on racial discrimination in the labor market). Instead, if effort differences, as discussed in Subsection 3.2.1, were solely due to expectations about the transfer choice by the third-party allocator, controlling for these expectations should eliminate any treatment differences. However, our data shows this is not the case, suggesting a more complex interplay between the two factors with a considerably higher relative weight on taste-based explanations. We acknowledge that other factors, such as a higher perceived cost of effort when the beneficiary changes, may have affected the participant's effort. However, we lack a measure for this possible mechanism.

Online Appendix Table B.9 summarizes to which extent beliefs about the share to be transferred mediate treatment effects. We briefly discuss the results of this analysis for those differences reaching at least marginal significance outlined above (see Subsection 3.2.1). First, controlling for beliefs reduces the difference between participants with a strong identification with other Germans and those without, from -4.3 sliders to -3.7 sliders when the recipient is an asylum seeker (a reduction of 12.9 percent). Second, among the participants without strong identification, the difference between the recipient being an asylum seeker and a German shrinks from 4.6 sliders to 3.8 sliders (18.8 percent). Third, among participants with a strong identification with other Germans, controlling for beliefs only marginally increases the difference in effort between German and asylum seeker recipients from 2.67 to 2.77 sliders (3.6 percent).

Similarly, the difference in effort exerted in the case of an economic migrant recipient relative to an asylum seeker recipient in the group of participants with a strong identification with other Germans is virtually unaffected by controlling for beliefs about the share to be redistributed (an increase by 0.3 percent from 2.97 to 2.98 sliders). The differences-in-differences between participants with and without a strong identification with other Germans when a German instead of an asylum seeker is the potential recipient decreased from 7.28 sliders to 6.52 sliders (10.54 percent). Lastly, controlling for beliefs shows only a small (12.14 percent) mediating effect on the respective differences-in-differences estimate contrasting economic migrants and asylum seekers.

Overall, these results reveal rather limited effects of beliefs about the third-party allocator's redistribution choice on effort differences regarding the recipient's identity. This finding is also consistent with the weak correlation between effort and beliefs in the aggregate we reported in Subsection 3.2.1. Hence, we favor an explanation of effort differences among those reporting a strong ingroup identification based on taste-based discrimination instead of being caused by an expectation to be taxed more strongly in case the potential recipient is from the asylum seeker outgroup. Our results thus relate to findings by, e.g., Hedegaard and Tyran (2018), who report that juveniles hired for a simple office job are willing to incur costs, such as reduced earnings, to avoid interacting or working with members of specific groups in two treatments that either provide information about co-worker productivity or not. Similar to our experiment, their results indicate an explanation based on animus or taste-based discrimination.[13]

4 Discussion and conclusion

We report results from an experiment in which a student sample with exclusively German citizenship exert real effort in a variant of the slider task (Gill and Prowse, 2012, 2019) to study ingroup favoritism in a setting that resembles a simplified version of a welfare state. We informed participants that part of their earnings might be redistributed to a recipient, whereby the choice of the transfer-determining tax rate lies in the hands of a third-person allocator. In three treatments, administered in a between-subject design, the recipient is either (i) a German citizen, (ii) an asylum seeker, or (iii) an economic migrant.

The extant literature has found that ethnic heterogeneity may affect the welfare state in several dimensions, such as income redistribution and public goods provision. This paper aimed to examine whether ethnic heterogeneity may also affect workers' propensity to exert effort, knowing that earning redistribution may affect either fellow country people or

[13]Consistent with our findings, a recent review by Lippens et al. (2022) demonstrates that numerous studies examining labor market interactions tend to provide a greater proportion of evidence supporting taste-based discrimination as opposed to statistical discrimination.

immigrants, distinguishing between economic migrants and asylum seekers. We found that, even if we cannot detect an effect of the recipient's identity in the aggregate, this hides an essential difference between people who closely identify with other Germans and people who do not. The former group tends to exert less effort when the recipient is an asylum seeker than the latter group. Workers closely identifying with other Germans also tend to put more effort when the redistribution recipient is German, or an economic migrant than when the recipient is an asylum seeker, while workers not identifying with other Germans tend to do the opposite.

Our analysis suggests that lower altruism toward asylum seekers or higher perceived costs of effort rather than an instance of statistical discrimination is at the base of the observed discrimination. In our context, statistical discrimination would operate through the belief that the allocator will benefit asylum seekers more than others. While it is indeed the case that participants, in particular those with a strong identification with other Germans, expect, on average, more redistribution toward asylum seekers than to German recipients, we show that this belief does not significantly affect their effort (see Subsections 3.2.1 and 3.2.3). While, in principle, there could be room for statistical discrimination to operate, its effect is negligible, according to our findings. Instead, the analyses suggest that the relatively lower effort by *Close* participants when the recipient is an asylum seeker is mainly driven by animus or taste-based discrimination (Becker, 1974).

Upon initial examination, the discovery that beliefs about the extent of redistribution are not correlated with workers' efforts appears perplexing from an economic perspective. As discussed in Section 2, when an individual's own payoffs are valued more than the recipient's, one would theoretically expect higher anticipated tax rates to correlate with reduced effort levels. However, the data contradicts this assumption (refer to Subsection 3.2.1). Consequently, the negligible correlation between beliefs and effort might suggest that workers consider their own payoffs and the transfers to recipients as equally important. This interpretation, however, conflicts with the evident pattern of discrimination observed when investigating exerted effort. A plausible interpretation that aligns with our findings is that workers largely ignored the potential redistribution of their earnings to the recipient, focusing instead solely on the recipient's identity when determining their effort. As a result, we posit that the observed discrimination (ingroup favoritism) in the effort exerted by workers, especially those with strong ingroup identification, when faced with various recipient types, is attributable to taste-based discrimination. Hence, we believe that the observed form of discrimination operates through mechanisms that are separate from purely economic calculations based on marginal utilities and expected payoffs.

Instead, we posit that the mere possibility of one's efforts benefiting members of an outgroup, such as asylum seekers or economic migrants in our case, could influence workers' moods and consequently affect their productivity. In this regard, Oswald et al. (2015) show

in a series of experiments that happier individuals tend to be more productive than their less content counterparts.[14] This connection is further supported by de Neve and Oswald (2012), who establish a positive link between life satisfaction during youth and income levels later in life using survey data. In the context of our experiment, workers predisposed to prejudice, as indicated by their ingroup identification (Fong and Luttmer, 2009), and confronted with a recipient from an ethnic outgroup may well experience negative emotions. This emotional response could subsequently affect their happiness, motivation, and performance (Kaplan et al., 2009; Oswald et al., 2015; Diener et al., 2020). Relatedly, Hedegaard and Tyran (2018) demonstrate that taste-based discrimination, independent of statistical discrimination, may reduce young workers' inclination to collaborate with a coworker from an ethnic outgroup, even when such collaboration would lead to favorable monetary outcomes. This suggests that the negative emotions associated with interacting with outgroup members has the potential to override rational economic decision-making and, consequently, influence workers' efforts and performance in the task.

Nevertheless, we recognize that the lack of correlation between beliefs and effort levels could be, at least in part, a consequence of the experimental design itself. First, the uncertainty regarding the share that would be redistributed might have led to weaker weights in participants' decision-making than an approach manipulating the share to be redistributed across treatments (Wu and Gonzalez, 1999). However, the design choice of eliciting beliefs was motivated by the possibility of then comparing beliefs to third-party allocators' actual choices from the companion paper (Grimalda et al., 2022). Second, the beliefs' effect was possibly partially masked by imprecise measurements focussing on a single data point in each round of the task. Another alternative would be not to ask for a point estimate of the share that would be redistributed but for a more detailed characterization of its distribution.[15] However, previous research has shown that (incentivized) elicitation of beliefs may also carry the risk of impacting behavior, at least in strategic games, e.g., by prompting deeper reflections or even changing incentives of the games (Croson, 2000; Blanco et al., 2010; Gächter and Renner, 2010). In addition, when participants are asked about their beliefs or expectations, this may increase the likelihood that participants try to infer the experimenter's intentions or hypotheses. This can lead to demand effects, where participants adjust their behavior to align with what they perceive to be the "desired" response, potentially skewing the results (de Quidt et al., 2018). Therefore, we only collected data on beliefs in the simplest possible form without impacting the primary analysis variable in our study, that is, effort. Moreover,

[14]See Diener et al. (2020) for a review on the connection between (positive) emotions and outcomes at the work place.

[15]In our case, the design choice of asking for the beliefs was grounded on the relationship to the other experiment (Grimalda et al., 2022) of the project, in which actual third-party allocators decide the allocation of the workers' earnings between the workers and the recipients of the corresponding identities. Therefore, the elicitation of beliefs allowed us to compare them with the allocators' actual choices and establish their inaccuracy, particularly concerning ordering.

despite the methodological limitations discussed before, we contend that if beliefs about the redistributed share were the primary drivers of effort and the observed discriminatory behavior, we should have discovered a more substantial correlation than the near-zero value we identified.

In conclusion, our study provides valuable insights but should be interpreted with caution when applied to real-world scenarios. The experimental stakes involved, with a maximum of 10 Euros, were minimal compared to the actual income typically subject to taxation. Additionally, the laboratory setting and slider task are inherently artificial. Notably, the experimental design did not allow the recipient to work or contribute to the welfare state, simplifying the potential effect of ethnic heterogeneity on individual effort for clearer analysis. We believe the effect of ethnic heterogeneity we observed in the experiment may arguably be interpreted as the upper bound of what one may expect in real life. In reality, immigrants make significant contributions to the welfare state, which could reduce the impact of ethnic heterogeneity observed in the study. Nevertheless, the public often underestimates immigrants' contributions to tax revenues and the economy (Dustmann and Frattini, 2014; Alesina et al., 2022). Moreover, akin to Hedegaard and Tyran (2018), participants in our study are relatively young. Prejudice is generally observed to be more pronounced among older individuals (Charles and Guryan, 2008), meaning the real-life effects may not be too far from our findings, particularly for those with a strong ingroup identity.

Our research underscores the relevance of understanding how a subset of people with strong ingroup identification may sacrifice potential earnings if outgroup members stand to benefit. This is particularly pertinent for societies grappling with increased heterogeneity due to immigration. However, more research is necessary to determine the extent to which these findings apply to real-world situations and non-student populations. Further study could provide valuable policy implications for addressing economic disparities and fostering social cohesion in diverse communities.

References

Abbink, Klaus, Jordi Brandts, Benedikt Herrmann, and Henrik Orzen. 2010. "Intergroup Conflict and Intra-Group Punishment in an Experimental Contest Game." *American Economic Review*, 100 (1): 420–447.

Abbink, Klaus and Donna Harris. 2019. "In-group favouritism and out-group discrimination in naturally occurring groups." *PloS one*, 14 (9): e0221616.

Akerlof, George A. and Rachel E. Kranton. 2000. "Economics and Identity." *The Quarterly Journal of Economics*, 115 (3): 715–753.

Alesina, Alberto, Reza Baqir, and William Easterly. 1999. "Public Goods and Ethnic Divisions." *The Quarterly Journal of Economics*, 114 (4): 1243–1284.

Alesina, Alberto, Matteo Ferroni, and Stefanie Stantcheva. 2021a. "Perceptions of racial gaps, their causes, and ways to reduce them." *NBER Working Paper*, 29245.

Alesina, Alberto and Paola Giuliano. 2011. "Preferences for redistribution." In *Handbook of Social Economics*, edited by Benhabib, Jess, Alberto Bisin, and Matthew O. Jackson Volume 1A. of Handbook of Economics 93–131, Burlington: Elsevier Science.

Alesina, Alberto and Edward Ludwig Glaeser. 2004. *Fighting poverty in the US and Europe: A world of difference*. Oxford: Univ. Press.

Alesina, Alberto, Johann Harnoss, and Hillel Rapoport. 2021b. "Immigration and the Future of the Welfare State in Europe." *The ANNALS of the American Academy of Political and Social Science*, 697 (1): 120–147.

Alesina, Alberto and Eliana La Ferrara. 2005. "Preferences for redistribution in the land of opportunities." *Journal of Public Economics*, 89 (5-6): 897–931.

Alesina, Alberto, Armando Miano, and Stefanie Stantcheva. 2022. "Immigration and Redistribution." *The Review of Economic Studies*, Accepted Manuscript (0): 1–39.

Alesina, Alberto, Elie Murard, and Hillel Rapoport. 2021c. "Immigration and preferences for redistribution in Europe." *Journal of Economic Geography*, 21 (6): 925–954.

Algan, Yann, Camille Hémet, and David D. Laitin. 2016. "The Social Effects of Ethnic Diversity at the Local Level: A Natural Experiment with Exogenous Residential Allocation." *Journal of Political Economy*, 124 (3): 696–733.

Almås, Ingvild, Alexander W. Cappelen, and Bertil Tungodden. 2020. "Cutthroat Capitalism versus Cuddly Socialism: Are Americans More Meritocratic and Efficiency-Seeking than Scandinavians?" *Journal of Political Economy*, 128 (5): 1753–1788.

Anderson, Lisa R., Roland G. Fryer, and Charles A. Holt. 2006. "Discrimination: Experimental evidence from psychology and economics." In *Handbook on the economics of discrimination*, edited by Rodgers, William M. 97–115, Cheltenham, U.K and Northampton, Mass: Edward Elgar.

Araujo, Felipe A., Erin Carbone, Lynn Conell-Price, Marli W. Dunietz, Ania Jaroszewicz, Rachel Landsman, Diego Lamé, Lise Vesterlund, Stephanie W. Wang, and Alistair J. Wilson. 2016. "The slider task: An example of restricted inference on incentive effects." *Journal of the Economic Science Association*, 2 (1): 1–12.

Ariely, Dan, Emir Kamenica, and Dražen Prelec. 2008. "Man's search for meaning: The case of Legos." *Journal of Economic Behavior & Organization*, 67 (3-4): 671–677.

Balliet, Daniel, Junhui Wu, and Carsten K. W. de Dreu. 2014. "Ingroup favoritism in cooperation: A meta-analysis." *Psychological Bulletin*, 140 (6): 1556–1581.

Bansak, Kirk, Jens Hainmueller, and Dominik Hangartner. 2016. "How economic, humanitarian, and religious concerns shape European attitudes toward asylum seekers." *Science*, 354 (6309): 217–222.

Becker, Gary S. 1971. *The economics of discrimination: 2d ed*. Economics research studies of the economics research center of the university of chicago, Chicago: University of Chicago Press.

Becker, Gary S. 1974. "A Theory of Social Interactions." *Journal of Political Economy*, 82 (6): 1063–1093.

Bernhard, Helen, Ernst Fehr, and Urs Fischbacher. 2006. "Group Affiliation and Altruistic Norm Enforcement." *American Economic Review*, 96 (2): 217–221.

Blanco, Mariana, Dirk Engelmann, Alexander K. Koch, and Hans-Theo Normann. 2010. "Belief elicitation in experiments: is there a hedging problem?" *Experimental Economics*, 13 (4): 412–438.

Brewer, Marilynn B. 1999. "The Psychology of Prejudice: Ingroup Love and Outgroup Hate?" *Journal of Social Issues*, 55 (3): 429–444.

Cappelen, Alexander W., James Konow, Erik Ø. Sørensen, and Bertil Tungodden. 2013. "Just Luck: An Experimental Study of Risk-Taking and Fairness." *American Economic Review*, 103 (4): 1398–1413.

Chakravarty, Surajeet, Miguel A. Fonseca, Sudeep Ghosh, and Sugata Marjit. 2016. "Religious fragmentation, social identity and cooperation: Evidence from an artefactual field experiment in India." *European Economic Review*, 90 (3): 265–279.

Charles, Kerwin Kofi and Jonathan Guryan. 2008. "Prejudice and Wages: An Empirical Assessment of Becker's The Economics of Discrimination." *Journal of Political Economy*, 116 (5): 773–809.

Charness, Gary, Ramón Cobo-Reyes, and Natalia Jiménez. 2014. "Identities, selection, and contributions in a public-goods game." *Games and Economic Behavior*, 87 (3): 322–338.

Charness, Gary, Uri Gneezy, and Austin Henderson. 2018. "Experimental methods: Measuring effort in economics experiments." *Journal of Economic Behavior & Organization*, 149 (2): 74–87.

Charness, Gary, Luca Rigotti, and Aldo Rustichini. 2007. "Individual behavior and group membership." *American Economic Review*, 97 (4): 1340–1352.

Charness, Gary and Aldo Rustichini. 2011. "Gender differences in cooperation with group membership." *Games and Economic Behavior*, 72 (1): 77–85.

Chen, Si and Hannah Schildberg-Hörisch. 2019. "Looking at the bright side: The motivational value of confidence." *European Economic Review*, 120 (2): 103302.

Chen, Yan and Sherry Xin Li. 2009. "Group Identity and Social Preferences." *American Economic Review*, 99 (1): 431–457.

Cooper, David J. and John H. Kagel. 2016. "Other-Regarding Preferences: A Selective Survey of Experimental Results." In *The Handbook of Experimental Economics, Volume 2*, edited by Kagel, John H. and Alvin E. Roth 217–289, Princeton: Princeton University Press.

Croson, Rachel T.A. 2000. "Thinking like a game theorist: factors affecting the frequency of equilibrium play." *Journal of Economic Behavior & Organization*, 41 (3): 299–314.

Croson, Rachel T.A., Melanie Marks, and Jessica Snyder. 2008. "Groups Work for Women: Gender and Group Identity in Social Dilemmas." *Negotiation Journal*, 24 (4): 411–427.

Dahlberg, Matz, Karin Edmark, and Heléne Lundqvist. 2012. "Ethnic Diversity and Preferences for Redistribution." *Journal of Political Economy*, 120 (1): 41–76.

Diener, Ed, Stuti Thapa, and Louis Tay. 2020. "Positive Emotions at Work." *Annual Review of Organizational Psychology and Organizational Behavior*, 7 (1): 451–477.

Durante, Ruben, Louis Putterman, and Joël van der Weele. 2014. "Preferences for Redistribution and Perception of Fairness: An Experimental Study." *Journal of the European Economic Association*, 12 (4): 1059–1086.

Durrheim, Kevin, Michael Quayle, Colin G. Tredoux, Kim Titlestad, and Larry Tooke. 2016. "Investigating the Evolution of Ingroup Favoritism Using a Minimal Group Interaction Paradigm: The Effects of Inter- and Intragroup Interdependence." *PloS one*, 11 (11): e0165974.

Dustmann, Christian and Tommaso Frattini. 2014. "The Fiscal Effects of Immigration to the UK." *The Economic Journal*, 124 (580): 593–643.

Eckel, Catherine C. and Philip J. Grossman. 2005. "Managing diversity by creating team identity." *Journal of Economic Behavior & Organization*, 58 (3): 371–392.

Engel, Christoph. 2011. "Dictator games: A meta study." *Experimental Economics*, 14 (4): 583–610.

Everett, Jim A. C., Nadira S. Faber, and Molly J. Crockett. 2015. "Preferences and beliefs in ingroup favoritism." *Frontiers in Behavioral Neuroscience*, 9 (15): 1–21.

Falk, Armin and Andrea Ichino. 2006. "Clean Evidence on Peer Effects." *Journal of Labor Economics*, 24 (1): 39–57.

Falk, Armin and Christian Zehnder. 2013. "A city-wide experiment on trust discrimination." *Journal of Public Economics*, 100 (2): 15–27.

Fehr, Ernst, Erich Kirchler, Andreas Weichbold, and Simon Gächter. 1998. "When Social Norms Overpower Competition: Gift Exchange in Experimental Labor Markets." *Journal of Labor Economics*, 16 (2): 324–351.

Fehr, Ernst, G. Kirchsteiger, and A. Riedl. 1993. "Does Fairness Prevent Market Clearing? An Experimental Investigation." *The Quarterly Journal of Economics*, 108 (2): 437–459.

Fershtman, C. and U. Gneezy. 2001. "Discrimination in a Segmented Society: An Experimental Approach." *The Quarterly Journal of Economics*, 116 (1): 351–377.

Fong, Christina M. and Erzo F.P. Luttmer. 2009. "What Determines Giving to Hurricane Katrina Victims? Experimental Evidence on Racial Group Loyalty." *American Economic Journal: Applied Economics*, 1 (2): 64–87.

Fong, Christina M. and Erzo F.P. Luttmer. 2011. "Do fairness and race matter in generosity? Evidence from a nationally representative charity experiment." *Journal of Public Economics*, 95 (5-6): 372–394.

Gächter, Simon and Elke Renner. 2010. "The effects of (incentivized) belief elicitation in public goods experiments." *Experimental Economics*, 13 (3): 364–377.

Gill, David and Victoria Prowse. 2012. "A Structural Analysis of Disappointment Aversion in a Real Effort Competition." *American Economic Review*, 102 (1): 469–503.

Gill, David and Victoria Prowse. 2019. "Measuring costly effort using the slider task." *Journal of Behavioral and Experimental Finance*, 21 (2): 1–9.

Goette, Lorenz, David Huffman, and Stephan Meier. 2006. "The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence Using Random Assignment to Real Social Groups." *American Economic Review*, 96 (2): 212–216.

Grimalda, Gianluca, Lena Detlefsen, Fabian Paetzel, and Christoph Schütt. 2022. "Preferences for redistribution and discrimination: Ethnic diversity, education and volunteering matter." *mimeo*.

Guala, Francesco, Luigi Mittone, and Matteo Ploner. 2013. "Group membership, team preferences, and expectations." *Journal of Economic Behavior & Organization*, 86 (0): 183–190.

Hargreaves Heap, Shaun P. and Daniel J. Zizzo. 2009. "The Value of Groups." *American Economic Review*, 99 (1): 295–323.

Hedegaard, Morten S. and Jean-Robert Tyran. 2018. "The Price of Prejudice." *American Economic Journal: Applied Economics*, 10 (1): 40–63.

Kaplan, Seth, Jill C. Bradley, Joseph N. Luchman, and Douglas Haynes. 2009. "On the role of positive and negative affectivity in job performance: a meta-analytic investigation." *The Journal of Applied Psychology*, 94 (1): 162–176.

Konow, James. 2000. "Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions." *American Economic Review*, 90 (4): 1072–1092.

Kranton, Rachel E. and Seth G. Sanders. 2017. "Groupy versus Non-Groupy Social Preferences: Personality, Region, and Political Party." *American Economic Review: Papers & Proceedings*, 107 (5): 65–69.

Krawczyk, Michał W. 2010. "A glimpse through the veil of ignorance: Equality of opportunity and support for redistribution." *Journal of Public Economics*, 94 (1-2): 131–141.

Lippens, Louis, Stijn Baert, Abel Ghekiere, Pieter-Paul Verhaeghe, and Eva Derous. 2022. "Is labour market discrimination against ethnic minorities better explained by taste or statistics? A systematic review of the empirical evidence." *Journal of Ethnic and Migration Studies*, 48 (17): 4243–4276.

Luttmer, Erzo F.P. 2001. "Group Loyalty and the Taste for Redistribution." *Journal of Political Economy*, 109 (3): 500–528.

de Neve, Jan-Emmanuel and Andrew J. Oswald. 2012. "Estimating the influence of life satisfaction and positive affect on later income using sibling fixed effects." *Proceedings of the National Academy of Sciences of the United States of America*, 109 (49): 19953–19958.

Nicklisch, Andreas and Fabian Paetzel. 2020. "Need-Based Justice and Distribution Procedures: The Perspective of Economics." In *Need-Based Distributive Justice*, edited by Traub, Stefan and Bernhard Kittel 161–190, Cham: Springer International Publishing.

Ockenfels, Axel and Peter Werner. 2014. "Beliefs and ingroup favoritism." *Journal of Economic Behavior & Organization*, 108 (3): 453–462.

Oswald, Andrew J., Eugenio Proto, and Daniel Sgroi. 2015. "Happiness and Productivity." *Journal of Labor Economics*, 33 (4): 789–822.

de Quidt, Jonathan, Johannes Haushofer, and Christopher Roth. 2018. "Measuring and bounding experimenter demand." *American Economic Review*, 108 (11): 3266–3302.

Romano, Angelo, Daniel Balliet, Toshio Yamagishi, and James H. Liu. 2017. "Parochial trust and cooperation across 17 societies." *Proceedings of the National Academy of Sciences of the United States of America*, 114 (48): 12702–12707.

Romano, Angelo, Giuliana Spadaro, Daniel Balliet, Jeff Joireman, Caspar van Lissa, Shuxian Jin, Maximilian Agostini, Jocelyn J. Bélanger, Ben Gützkow, Jannis Kreienkamp, N. Pontus Leander, and PsyCorona Collaboration. 2021. "Cooperation and trust across societies during the COVID-19 pandemic." *Journal of Cross-Cultural Psychology*, 52 (7): 622–642.

Rong, Rong, Daniel Houser, and Anovia Yifan Dai. 2016. "Money or friends: Social identity and deception in networks." *European Economic Review*, 90 (4): 56–66.

Slonim, Robert and Pablo Guillen. 2010. "Gender selection discrimination: Evidence from a Trust game." *Journal of Economic Behavior & Organization*, 76 (2): 385–405.

Solow, John L. and Nicole Kirkwood. 2002. "Group identity and gender in public goods experiments." *Journal of Economic Behavior & Organization*, 48 (4): 403–412.

Stichnoth, Holger and Karine van der Straeten. 2013. "Ethnic Diversity, Public Spending, and Individual Support for the Welfare State: A Review of the Empirical Literature." *Journal of Economic Surveys*, 27 (2): 364–389.

Sutter, Matthias. 2009. "Individual Behavior and Group Membership: Comment." *American Economic Review*, 99 (5): 2247–2257.

Tabellini, Marco. 2020. "Gifts of the Immigrants, Woes of the Natives: Lessons from the Age of Mass Migration." *The Review of Economic Studies*, 87 (1): 454–486.

Tajfel, Henri. 1982. "Social Psychology of Intergroup Relations." *Annual Review of Psychology*, 33 (1): 1–39.

Tajfel, Henri, M. G. Billig, R. P. Bundy, and Claude Flament. 1971. "Social categorization and intergroup behaviour." *European Journal of Social Psychology*, 1 (2): 149–178.

Tajfel, Henri, Jane Sell, W. I. Griffith, and Rick K. Wilson. 1993. "Are Women More Cooperative Than Men in Social Dilemmas?" *Social Psychology Quarterly*, 56 (3): 211–222.

Tanaka, Tomomi and Colin F. Camerer. 2016. "Trait perceptions influence economic out-group bias: Lab and field evidence from Vietnam." *Experimental Economics*, 19 (3): 513–534.

Traub, Stefan, Christian Seidl, Ulrich Schmidt, and Maria Vittoria Levati. 2005. "Friedman, Harsanyi, Rawls, Boulding – or somebody else? An experimental investigation of distributive justice." *Social Choice and Welfare*, 24 (2): 283–309.

Turner, J. C., R. J. Brown, and Henri Tajfel. 1979. "Social comparison and group interest in ingroup favouritism." *European Journal of Social Psychology*, 9 (2): 187–204.

Wu, George and Richard Gonzalez. 1999. "Nonlinear Decision Weights in Choice Under Uncertainty." *Management Science*, 45 (1): 74–85.

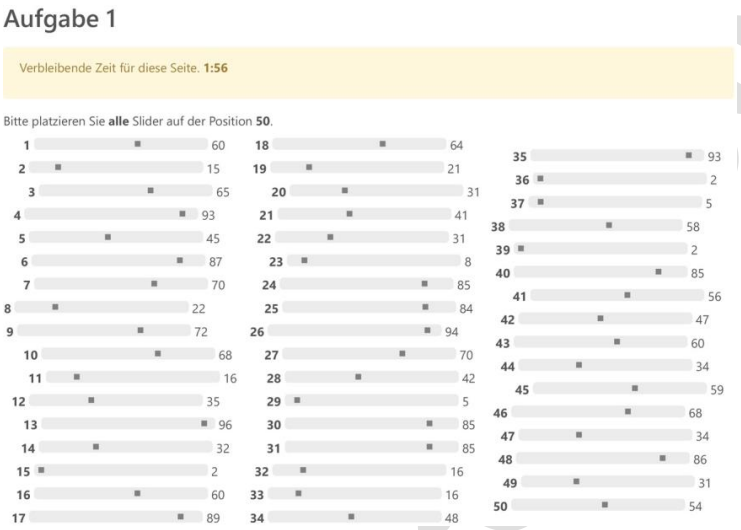
A Appendix

Table A.4: Detailed Sample Characteristics

	Mean	SD	Median	IQR	Min	Max	Obs
Female	0.50	0.50	0.5	1	0	1	172
Age in years	25.71	4.53	25	4.5	18	47	172
Dual citizenship	0.05	0.22	0	0	0	1	172
Participant born in Germany	0.95	0.22	1	0	0	1	172
Mother born in Germany	0.94	0.23	1	0	0	1	172
Father born in Germany	0.90	0.30	1	0	0	1	172
Political left to right	2.53	0.59	3	1	1	4	172
Closeness	2.34	0.86	2	1	1	5	172

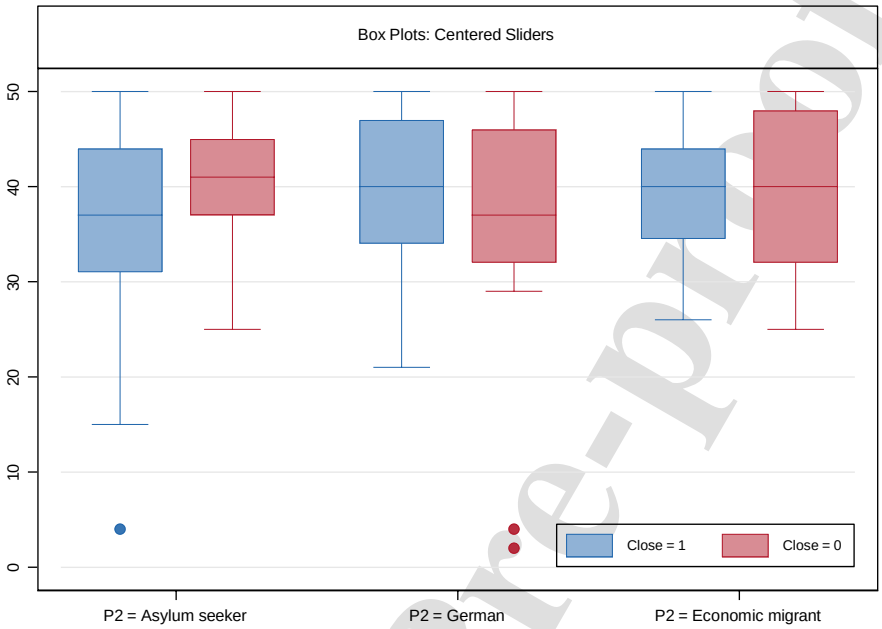
Notes: Table displays summary statistics of sample characteristics. "Female" is the average share of females. "Age in years" is the average age in years. "Dual citizenship" is the share of participants holding a dual citizenship. "Participant born in Germany" is the share of participants born in Germany, analogously for "Mother/Father born in Germany" variables. "Political left to right" is ranging from 1 (very left) to 5 (very right). "Closeness" is a measure of closeness to Germans, ranging from 1 (very close) to 5 (very distant).

Figure A.3: Screenshot: Slider task



Note: This figure shows an exemplary screenshot from the variant of the slider task we used in the computer laboratory.

Figure A.4: Boxplot: Effort by Treatment and Closeness



Note: This figure shows Tukey's boxplots for the effort measure by treatment and self-reported ingroup identification.

Highlights

- Our study quantifies productivity when the recipient of redistribution is either an immigrant or a co-national.
- Workers with a strong national identity tend to exhibit lower productivity when recipients are asylum seekers.
- Workers significantly overestimate the redistribution rate to asylum seekers.
- Workers without a strong national identity display the opposite behavior.
- Our findings suggest that taste-based factors or animus drive the observed ingroup favoritism rather than expectations.

The authors declare no conflict of interests.