



# Unequal opportunities, social groups, and redistribution: Evidence from Germany<sup>☆</sup>

Rene Schwaiger<sup>a,\*</sup>, Jürgen Huber<sup>a</sup>, Michael Kirchler<sup>a</sup>, Daniel Kleinlercher<sup>a</sup>, Utz Weitzel<sup>b,c</sup>

<sup>a</sup> Department of Banking and Finance, University of Innsbruck, Universitätsstraße 15, Innsbruck, 6020, Austria

<sup>b</sup> Vrije Universiteit Amsterdam & Tinbergen Institute, De Boelelaan 1105, Amsterdam 1081 HV, the Netherlands

<sup>c</sup> Radboud University, Institute for Management Research, Heyendaalseweg 141, Nijmegen 6525 AJ, the Netherlands

## ARTICLE INFO

### JEL classification:

C91  
G11  
G41

### Keywords:

Online experiment  
Redistribution  
Fairness  
Immigration  
Opportunities

## ABSTRACT

In this paper we investigate the generalizability of the role of unequal opportunities and social group membership in redistributive preferences and examine the interaction between these two dimensions. We present results from a large-scale online experiment with more than 4,000 participants from Germany. The experiment consists of a real-effort task and a subsequent dictator game with native Germans and immigrants to Germany. We find that dictator transfers to the own group by native Germans and immigrants are higher under unequal opportunities than under equal opportunities. While we confirm the main findings reported in previous literature regarding the role of inequality of opportunity in redistribution for native Germans and immigrants, we find distinctively different patterns between both groups concerning the influence of social group membership and its interaction with unequal opportunities on redistribution. In particular, contrary to natives, immigrant dictators transfer more to in-group than to out-group receivers under unequal opportunities and do not compensate for unequal opportunities of out-group members. We conclude that in order to increase the understanding of patterns reported in the literature, it is crucial to also investigate the generalizability of findings to individuals from the general population and to explicitly cover participants such as immigrants who represent important parts of our society.

## 1. Introduction

Since the 1980s, inequality in income and wealth has increased sharply within many developed countries (Frick & Grabka, 2009; Saez & Piketty, 2014; Saez & Zucman, 2016). Inequality in terms of income and wealth is associated with more unequal opportunities in society, which affect future generations in particular. For instance, Woessmann (2004), Duncan & Murnane (2011), Corak (2013), Corak (2016), and Scheidel (2017) report income and educational elasticities between generations, which imply that children's income and education are positively correlated with their parents' income and education.<sup>1</sup> Moreover,

relative disadvantages due to unequal opportunities are not only prevalent among children with lower socio-economic status, but also among immigrants, who are often confronted with unequal opportunities from the start (see e.g., Schnepf, 2007). In recent years, this social group has been under scrutiny in the U.S. and in some European countries, because of the immigration waves between 2014 and 2017, which have, in several elections, shifted political support toward right-wing and conservative parties (Otto & Steinhardt, 2014; Halla, Wagner, & Zweimüller, 2017; Davis & Deole, 2018). Such parties typically exhibit preferences for lower social transfers compared to social-democratic parties (Esping-Andersen, 1990; Fuller, Alston, & Vaughan, 1995).

<sup>☆</sup> We thank two anonymous referees, Christian König-Kersting, Christopher Roth, Daniel Müller, Dietmar Fehr, Fanny Dellinger, Matthias Stefan, and conference participants at the 2022 Special ESA Meeting Buenos Aires for very valuable comments on previous versions of this paper. Financial support from the Austrian Science Fund FWF (P29362-G27 J. Huber, START-grant Y617-G11 Kirchler, and SFB F63) is gratefully acknowledged. There exist no conflicts of interest of any of the authors involved in this project. The project was pre-registered, and the data and replication materials are provided on the Open Science Framework (OSF): [Link](https://doi.org/10.1016/j.socex.2022.101911). This study was ethically approved by the IRB at the University of Innsbruck.

\* Corresponding author.

E-mail address: [rene.schwaiger@uibk.ac.at](mailto:rene.schwaiger@uibk.ac.at) (R. Schwaiger).

<sup>1</sup> Empirical measures of the degree of unequal opportunities in several countries have shown that a considerable part of overall income inequality can be attributed to factors beyond one's control, even when only a few factors are taken into account (see e.g., Checchi, Peragine, & Serlenga, 2010; Brunori, 2017).

This is in line with findings indicating that higher shares of immigrants are associated with decreased support for social transfers and redistribution (Alesina, Murard, & Rapoport, 2020). Lower revealed and stated preferences for redistribution can even occur when participants in an experiment are made to think about immigration without being given additional information on the topic (Alesina, Miano, & Stantcheva, 2022). Recent survey evidence from the general population has demonstrated that the interaction between inequality, social identity, and equality of opportunities also plays a role in the support of redistribution. Specifically, there seems to be selective solidarity regarding unequal opportunities (Magni, 2020). To the best of our knowledge, this interaction in redistributive preferences has never been tested experimentally.

In this study, we examine general redistributive behavior in a dictator game and whether the behavior depends on equal or unequal opportunities and on the social group membership of transfer receivers. We innovate by answering these research questions in online experiments with 4,035 individuals from the general German population, native Germans and immigrants to Germany. 2,077 participants had the possibility to redistribute an amount of money earned in a real-effort task. Thus, our study improves the dimension of external validity due to the large representative samples of real social groups and guarantees the internal validity of an experiment based on incentivized decisions and a parsimonious design. The influence of group membership and unequal opportunities on preferences for redistribution has usually been investigated among students (see e.g., Chen & Li, 2009; Klor & Shayo, 2010; Krawczyk, 2010; Caballero, 2014; Durante, Putterman, & van der Weele, 2014; Rey-Biel, Sheremeta, & Uler, 2018; Akbaş, Ariely, & Yuksel, 2019). In such a case, the behavior in economic experiments can only reasonably be generalized to individuals that have specific characteristics in common with student participants (young age, higher education, etc.). Bellemare & Kröger (2007) and Anderson et al. (2013), for example, find that student participants are not sufficiently representative of the general population. We overcome this by approaching more than 4,000 Germans from the general population.<sup>2</sup> We further innovate by experimentally investigating the interaction between the two dimensions of social group membership and equality of opportunities with respect to redistributive behavior. Specifically, we investigate whether the willingness to compensate for unequal opportunities differs conditional on the group membership of the transfer recipients (i.e., native Germans or immigrants to Germany).

The policy importance of examining this interaction stems from the fact that strong group considerations could alter social preferences regarding unequal opportunities. This could potentially undermine welfare if people voted against otherwise desirable redistributive measures to counteract unequal opportunities simply because they fear that members of an out-group might benefit from these measures. Policy-makers should be aware of the drivers of social preferences of citizens to

<sup>2</sup> Note that Germany is an ideal test bed to examine the generalizability of the findings on the influence of unequal opportunities and social group membership on redistribution across groups of people. First, in terms of wealth, Germany is a country with relatively high inequality: The wealth distribution across German households is strongly right-skewed with a mean to median net wealth ratio of approximately 3.3 (Organization for Economic Co-operation and Development (OECD) average is about 2.6; see OECD (2018b); Bundesbank (2019)). Second, Germany has been associated with relatively unequal opportunities regarding education and earnings. This manifests itself in a comparatively low degree of social mobility (Woessmann, 2004; OECD, 2018a). Third, Germany recently experienced a large influx of refugees. Approximately 1.5 million asylum seekers (about 1.86% of the German population based on 2014 data) arrived between 2014 and 2017 (Grote, 2018). In 2016, Germany faced the highest share of asylum applicants per 100,000 inhabitants of all European Union (EU) member countries (Kury & Slawomir, 2018). This sparked an ongoing public debate about immigration and challenges regarding social cohesion.

make informed decisions. For example, do people reject costly compensation for unequal opportunities in itself, or are such measures only undesirable because they might benefit “unwelcome” out-groups?

The experiment consisted of two stages: In the first stage, we applied an incentivized real-effort task, the slider task by Gill & Prowse (2012), to allow participants to earn money. In the second stage, participants were assigned the role of either dictator or receiver in a standard one-shot dictator game. The assignment to one of the two roles depended on the participants’ performance in the slider task compared to a reference group: the half who performed better (henceforth, high-score group) was assigned the role of dictators, and the others (henceforth, low-score group) were the receivers. Across the first treatment dimension, we varied equal vs. unequal (initial) opportunities in the task. Either all participants had equal opportunities to be in the high-score group, or in the unequal condition, half of the participants had “bad luck” and got six solved sliders deducted from their score.<sup>3</sup> Across the second treatment dimension, we varied the social group membership of receivers by matching native Germans and immigrants either with another individual from their own “in-group” or the other demographic group (“out-group”) in the dictator game. Specifically, we selected (i) Germans without an immigration background over two generations (henceforth, “native Germans”) and (ii) first- and second-generation immigrants from non-EU countries (henceforth, “immigrants” or “immigrants to Germany”).

Regarding opportunities in the task, we find that both, native Germans and immigrants, transfer more to in-group receivers under unequal opportunities than under equal opportunities. To isolate the willingness to compensate for the presence of unequal opportunities for others, we also make a distinction, between dictators who were disadvantaged (those who had bad luck and still made it into the high-score group) and those who were not. For both social groups we find evidence for a preference to compensate for the existence of unequal opportunities, because non-disadvantaged dictators transfer larger amounts to in-group receivers under unequal opportunities than dictators under equal opportunities. Moreover, similar to their non-disadvantaged peers, we find evidence that even disadvantaged dictators from both groups transfer more to the in-group under unequal opportunities than decision makers under equal opportunities.

Regarding social group membership, we find that native and immigrant dictators do not transfer statistically significantly different amounts to out-group members compared to in-group members under equal opportunities. Nevertheless, in contrast to native dictators, immigrant dictators transfer more to the in-group (fellow immigrants) than to the out-group (native Germans) under unequal opportunities. Additionally, as opposed to native dictators, immigrant dictators do not compensate for unequal opportunities of out-group members.

By addressing different societal groups, our research design leads to novel insights with regard to in- and out-group compensation for unequal opportunities, but also improves the external validity of past findings from the literature by examining its generalizability to two social groups in the general German population. Furthermore it improves our understanding of the societal complexity across different social groups. To the best of our knowledge, this study represents the first large-scale experiment on redistribution among the general

<sup>3</sup> We base our understanding of the term “equal opportunity” on Roemer (1998) who proposed a definition of equal opportunity according to which individuals who exert the same amount of effort also achieve the same outcome. This is the case for the former group but not the latter where, consequently, there are unequal opportunities because factors beyond ones own control (luck) influence outcomes in addition to effort.

		Social Group Membership	
		In-group	Out-group
Opportunities	Equal	EQOP_IN	EQOP_OUT
	Unequal	UNOP_IN	UNOP_OUT

**Fig. 1.** Overview of the experimental treatments interacting both dimensions. First dimension: Variation across opportunities in the real-effort task. Second dimension: Variation across the social group membership of receivers. 2x2 factorial design with the four between-subject treatments EQOP\_IN, EQOP\_OUT; UNOP\_IN; UNOP\_OUT.

population in Europe, involving a sample of immigrants as a distinct social group that is often exposed to unequal opportunities in real life.<sup>4</sup>

## 2. Experimental design and procedure

### 2.1. Task, dictator game and treatments

We designed an online experiment consisting of two stages. In the first stage, we applied the slider task by Gill & Prowse (2012). After practicing, participants saw 48 horizontally shifted sliders that ranged from 0 to 100, and participants had to place as many as possible on a value of 50 within two minutes (see the instructions in the Appendix for a screenshot).<sup>5</sup>

After performing the slider task, participants were assigned the role of either dictator or receiver in a dictator game, depending on their performance in the slider task. Importantly, participants were not informed prior to the slider task that the amount earned could be redistributed in a second stage to rule out unintended effects at this point in the experiment. To arrive at a benchmark for high-score group membership and low-score group membership, we sampled a pre-wave of 200 individuals in December 2018. Half of them were native Germans, and the other 100 were immigrants to Germany. The participants of this pre-wave performed only the slider task. The statistical properties of their performance served as the benchmark in the main experiment. The median of correctly placed sliders in this pre-wave was 9.5. Thus, participants who correctly placed 10 or more sliders in the main experiment reached the high-score group and were assigned the role of dictator (receiving € 12 as payoff for the slider task). Those with 9 or fewer correctly placed sliders ended up in the low-score group and were receivers (earning € 0 for the task) in the dictator game.<sup>6</sup>

Fig. 1 depicts the between-subject treatment structure. Across the first treatment dimension we varied (i) whether participants had equal opportunities to be in the high-score group. Under EQOP, all participants had equal opportunities. Under UNOP, half of the participants were randomly (with equal probability) allocated to the group BAD.LUCK where 6 sliders were deducted from their personal score after they had finished the slider task. This means that participants in

this group effectively needed to solve 16 sliders (10 plus 6) to still become a dictator and receive € 12, which constituted unequal initial opportunities. (Bad) luck is, of course, only one possible cause of unequal opportunities, but, in contrast to other factors, it can be easily implemented in an experiment in a controlled setting. (Bad) luck has therefore been used quite frequently to model unequal opportunities in several studies (see, e.g., Cappelen, Halvorsen, Sørensen, & Tungodden, 2017; Rey-Biel et al., 2018).<sup>7</sup> A potential limitation, which is unavoidable with the given design, is that the mere knowledge about unequal opportunities might influence exerted effort, which can lead to a different behavior in the dictator game (Cherry, Frykblom, & Shogren, 2002). In the results section, we therefore test for potential differences in exerted effort between treatments and groups and control accordingly. We chose a deduction of 6 sliders in case of bad luck because the 75th percentile in the pre-wave was 16 (rounded). By deducting 6 sliders, we ensured that approximately half of the participants who would have received a payoff under EQOP did not receive a payoff with bad luck under UNOP. Therefore, roughly one third of all participants with bad luck and no payoff for the task under UNOP received no payoff because of bad luck, and two thirds because of their insufficient performance.

All dictators under UNOP received this objective probability before the dictator game. However, in order to leave some scope for the formation of beliefs, the dictators were not informed about the decisive reason why the receivers assigned to them did not receive any payment. This was done because incomplete information about the sources of inequality constitutes an essential feature when revealing redistributive preferences (e.g., in elections) in the real world. Moreover, Rey-Biel et al. (2018) show that, based on homogeneous information, there may be heterogeneity between cultural groups in beliefs about the sources of inequality, which can influence decisions in dictator games. The beliefs about the sources of inequality were measured after the dictators' decisions (INTERNAL.BELIEF). In particular, we asked dictators to indicate whether they believed that the decisive reason for their matched receiver not receiving a payoff was insufficient performance or bad luck.

For the second treatment dimension, we varied in- and out-group membership of receivers by matching native Germans and immigrants with another participant from either their own demographic group (INGROUP) or the other demographic group (OUTGROUP) in the dictator game. In OUTGROUP we paired native dictators and immigrant dictators with members of the other demographic group; that is, native dictators were matched with immigrant receivers and immigrant dictators with native receivers. For INGROUP, we matched native (immigrant) dictators with native (immigrant) receivers. Consequently, the information set under INGROUP and OUTGROUP differed only with respect to the group membership of the assigned receiver.<sup>8</sup>

The information available to all participants before the dictator game contained information on one's own payoff (€ 12 for dictators and € 0 for receivers), information that the matched receiver is older than 18 years of age, and information that the matched receiver is a resident of Germany and member of one's own or the other social group (in-group vs. out-group). Furthermore, we implemented a reminder about whether there were equal or unequal opportunities in the task.<sup>9</sup> Dictators, who all

<sup>4</sup> Compared to native Germans, the average immigrant starts with significant disadvantages, which constitute unequal opportunities, due to a multitude of reasons, such as language barriers, cultural segregation, and lack of locally required skill sets (see e.g., Schnepf, 2007).

<sup>5</sup> This slider task has a number of advantages: First, exerted effort can be controlled by the experimenter. Moreover, the task is straightforward to communicate online and does not require pre-existing knowledge or specific, cognitive skills. Furthermore, the task leaves no scope for guessing, and in contrast to mathematical tasks, the performance in the slider task has been shown to induce less task-related emotions, such as anxiety (Gill & Prowse, 2012; Lezzi, Fleming, & Zizzo, 2015; Charness, Gneezy, & Henderson, 2018).

<sup>6</sup> Participants did not receive a lump sum payment for their participation.

<sup>7</sup> Subsequent to the task under unequal opportunities, all participants were informed whether they had bad luck or not. This information was deliberately given after the task to avoid over-proportional dropout rates of participants with bad luck.

<sup>8</sup> We do not distinguish between in-group favoritism and out-group discrimination with a neutral reference group, but we are interested only in the differences between in- and out-group transfers overall. For a general comparison (see, e.g., Abbink & Harris, 2019).

<sup>9</sup> To minimize experimenter demand effects (or variations) between treatments, all treatment-dependent information was embedded in the general information set which was displayed to each participant. See the translation of the instructions in the Appendix.

faced advantageous inequality, then had to decide which amount  $y \in [0,12]$  of their earned payoff of € 12 they would like to transfer to the receiver. Thus, the final payoff for the dictator was  $p_1 = 12 - y$  and the final payoff for the receiver was  $p_2 = y$ . To ensure that the results are not driven by reciprocity concerns (Hoffman, McCabe, & Smith, 1996; Dufwenberg & Kirchsteiger, 2004), we told dictators before the final transfer decision that they had been anonymously and randomly matched with a receiver and that their final payoff depended only on their decision in the dictator game. For practical reasons, the random matching between dictators and receivers took place after the data collection process was completed while taking into account the treatment allocations of participants.

## 2.2. Procedure

In collaboration with *Dynata*, a survey sampling company, we invited 4,035 inhabitants of Germany of whom 1,996 were native Germans and 2,039 were immigrants. We limited the sample to the working age population, between 18 and 65 years of age. The online experiment was programmed using the software *Qualtrics*, and the experimental language was German (English translations of the instructions are included in the Appendix).

In total, we collected 2077 dictator observations, of which 991 stem from native Germans and 1,086 from immigrants. We defined and sampled native Germans and immigrants as follows. We refer to native Germans if the participants and both of their parents were born in Germany. We refer to immigrants if individuals were either born outside the European Union themselves or if both of their parents were born outside the European Union. We invited only participants with a migration background from non-EU countries for the sample of immigrants to ensure sufficient cultural heterogeneity and to induce an adequate out-group framing of native Germans compared to immigrants.<sup>10</sup> In order to avoid deception, we did not confront dictators with typically German vs. non-German names of receivers as indication of group membership. Instead, similar to Willinger, Keser, Lohmann, & Usunier (2003); Guillen & Ji (2011); Georg, Hennig-Schmidt, Walkowitz, & Winter (2016), and Barr, Lane, & Nosenzo (2018), we accurately told dictators whether their assigned receiver is a member of the in-group or the out-group, i.e., whether the receiver has an immigration background or not (see the instructions in the Appendix for further details). Based on survey evidence by Eckes (2002), people with an immigration background are viewed as an independent societal group by Germans. Sniderman, Hagedoorn, & Prior (2004) show that national identity can evoke exclusionary tendencies toward out-groups. Therefore, we classified immigrants as an out-group for native Germans and vice versa. To increase data quality, we implemented several quiz questions and attention checks in the experiment, which needed to be passed to be able to continue (see the instructions in the Appendix). Anduiza & Galais (2017) find that excluding participants who did not immediately pass attention checks can decrease the data quality. Therefore, we did not screen out participants for giving wrong answers in the attention checks, but let them proceed only once they had given the correct answer. We excluded observations where it was reasonable to assume that participants did not demonstrate an adequate level of attentiveness and seriousness. This applied to all participants who did not position a single slider correctly. Furthermore, we also symmetrically trimmed the sample by excluding participants with the 5% shortest and 5% longest processing times in the experiment. This left 1734 dictators in total, of whom 757 were native Germans and 977 were

<sup>10</sup> Note that the survey sampling company did not provide us with the exact countries of origin of the sampled immigrants.

immigrants.<sup>11</sup> The average duration in the experiment was 12.00 (SD = 3.77) minutes, and the average payoff was 6.12 Euro. On average, 12.01 (SD = 7.15) sliders were placed correctly in the slider task. The experimental online sessions were conducted between February and June 2019.

In addition, the participants answered an exit survey<sup>12</sup> on attitudes toward success in life, perceptions of social groups and information on the frequency of social contacts with out-group members in real life. The respondents also provided the following self-reported demographic, geographic and socioeconomic information: age, gender, education, parents' education, profession, federal state of residency, the total population of the town of residency, and gross annual income. Among immigrants, we asked whether the participants are first or second generation immigrants. Furthermore, we also asked participants to self-report their political orientation.

## 3. Results

### 3.1. Sample balancing, heterogeneity analyses, and descriptives

Before analyzing the treatment effects, we examine whether participant characteristics are balanced across treatments after the data cleaning procedure by testing for differences in the self-reported participant characteristics between treatments. We find that there are no statistically significant differences in these characteristics between treatments except for political attitudes of native German participants, which is shown in Table A.1 in the Appendix.<sup>13</sup>

Further, we test for structural differences in self-reported characteristics between the sample of native Germans and the sample of immigrants to determine relevant control variables for the analyses. As shown in Table A.3 in the Appendix, we find structural and statistically significant differences between native dictators and immigrant dictators with respect to almost all self-reported characteristics. Therefore, the econometric specifications in the results section include control variables for age, gender, income, political preferences, population of the town of residency, education, and parents' education. Additionally, we test for differences in the number of solved sliders between native Germans and immigrants. At the bottom of Table A.3 we report that there are no statistically significant differences in performance between the two groups. Nevertheless, because of the significant performance differences between the treatments, we include the number of solved sliders in the set of control variables. We indicate the usage of the complete set of control variables at the bottom of each regression table.

Based on census data from the German Federal Office of Statistics, we could infer that the initial sample of non-EU immigrants (participants or both of their parents were born outside the EU) is not entirely representative of the respective population in Germany, primarily concerning age and gender. The initial sample of native Germans (participants and both of their parents born in Germany) is also not entirely representative of their respective population regarding age. Specifically, native individuals aged between 30 and 45 are under-weighted by about six

<sup>11</sup> The results for the full sample are qualitatively similar to the main results presented in the results section of the paper and are reported in Tables A.6, A.7 and A.5 in the Appendix.

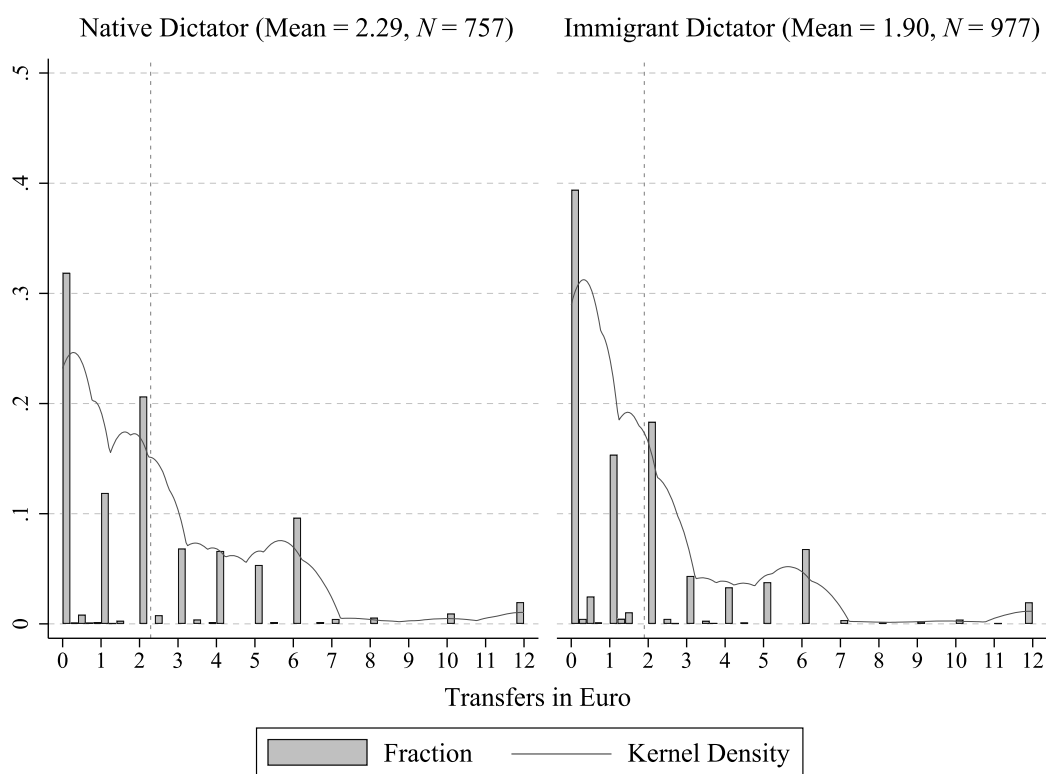
<sup>12</sup> More information on the exit survey is provided in Section A.1 in the Appendix.

<sup>13</sup> Moreover, at the bottom of Table A.1 we report statistically significant differences in exerted effort (PERFORMANCE) in the task between treatments. Specifically, participants in UNOP correctly position more sliders compared to participants in EQOP. Furthermore, in Table A.2 in the Appendix we show the descriptive statistics of the number of solved sliders across treatments. In Table A.8 in the Appendix we report the results of multivariate OLS regressions with the number of solved sliders (PERFORMANCE) of the participants as the dependent variable and all self-reported participant characteristics as independent variables.

**Table 1**

Descriptive statistics on transfers by native Germans and immigrants across treatments. Possible transfers range from € 0 to € 12. Transfers by native and immigrant dictators to receivers from the same social group are denoted by EQOP\_IN under equal opportunities and by UNOP\_IN under unequal opportunities. Transfers by native and immigrant dictators to members of the respective out-groups are indicated by EQOP\_OUT under equal opportunities and by UNOP\_OUT under unequal opportunities.

Transfers	Obs	Mean	SD	Median	Min	Max	95% CI	
Overall	1734	2.22	3.43	2.00	0	12	2.06	2.38
Native Germans	757	2.29	2.67	2.00	0	12	2.10	2.48
Immigrants	977	1.90	3.62	1.00	0	12	1.68	2.13
<b>Native Germans</b>	Obs	Mean	SD	Median	Min	Max	95% CI	
EQOP_IN	168	1.70	2.03	1.00	0	12	1.39	2.01
UNOP_IN	227	2.58	2.82	2.00	0	12	2.21	2.95
EQOP_OUT	150	2.06	2.64	1.00	0	12	1.63	2.48
UNOP_OUT	212	2.62	2.89	2.00	0	12	2.23	3.01
<b>Immigrants</b>	Obs	Mean	SD	Median	Min	Max	95% CI	
EQOP_IN	197	1.61	2.88	1.00	0	12	1.21	2.01
UNOP_IN	297	2.66	4.84	1.00	0	12	2.11	3.21
EQOP_OUT	194	1.42	2.70	1.00	0	12	1.04	1.81
UNOP_OUT	289	1.68	2.61	1.00	0	12	1.38	1.98



**Fig. 2.** Relative distribution of transfers by native dictators (left) and immigrant dictators (right). Possible transfers range from € 0 to € 12. The dashed vertical lines represent the means for each subject pool, and the overlaid kernel density plot shows estimated density functions of fractions among the two groups (bandwidth: 0.55).

percentage points and individuals aged between 55 and 65 are over-weighted by about six percentage points in the sample. Therefore, we applied a post-stratification approach with age and gender (interlocking) based on the official census data on these two specific populations from the German Federal Office of Statistics to weight observations by participants from under- and over-represented strata accordingly. For the analyses in this paper, we use the post-stratified samples with population sizes of 37,448,000 (native Germans) and 8,000,000 (immigrants) to guarantee a more representative picture of the populations. Table 1 shows descriptive statistics for the transfers by

both subject pools across treatments<sup>14</sup> and Fig. 2 shows the relative distributions of overall transfers by native and immigrant dictators.

Due to the large sample consisting of German citizens, which encompasses two different social groups of native Germans and immigrants, it is insightful to test for associations between transfers in the dictator game and the individual characteristics of the dictators. As the transfers are censored (minimum of 0 and maximum of 12), we apply

<sup>14</sup> The standard deviations of transfers in Table 1 were implicitly calculated by using the estimated standard error of the mean.

**Table 2**

Tobit regression with transfers by native Germans, immigrants, and both groups jointly as the dependent variables. Possible transfers range from € 0 to € 12. AGE represents the participants' age in years. The variable POL.LEFT-RIGHT represents a 7-point Likert scale on political preferences from left to right, with higher numbers indicating stronger preferences toward the right-wing political spectrum. MALE represents a dummy variable for gender taking a value of 1 for male participants and 0 for female participants. INCOME indicates the self-reported income of participants on a 5-point scale. INHABITANTS indicates the number of inhabitants of the participants' town of residence. EDUCATION and EDUCATION\_PARENTS represent the education level of the participant and her parents, respectively, with higher values indicating higher education. 1st.GEN.MIG is a binary dummy taking the value of 1 for transfers by first-generation immigrants and 0 for transfers by second-generation immigrants. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native German and 0 if the dictator is an immigrant. PERFORMANCE represents the number of correctly positioned sliders in the real-effort task.

	Native Dictator Model (I)	Immigrant Dictator Model (II)	Joint	
			Model (III)	Model (IV)
AGE	0.032* (0.012)	-0.009 (0.018)		0.027* (0.011)
POL.LEFT-RIGHT	-0.531*** (0.134)	0.005 (0.147)		-0.423*** (0.111)
MALE	0.280 (0.296)	0.755* (0.362)		0.327 (0.252)
INCOME	0.131 (0.116)	0.319* (0.156)		0.143 (0.101)
INHABITANTS	-0.156 (0.109)	0.064 (0.137)		-0.123 (0.095)
EDUCATION	-0.272* (0.114)	0.014 (0.150)		-0.215* (0.096)
EDUCATION_PARENTS	0.126 (0.104)	-0.172 (0.097)		0.056 (0.082)
Output	-0.053* (0.027)	-0.070* (0.029)		-0.057* (0.023)
1st_GEN_MIG		0.257 (0.368)		
DIC_NATIVE			0.589* (0.231)	0.279 (0.241)
Constant	3.508*** (1.040)	0.707 (1.414)	0.940*** (0.183)	2.903*** (0.876)
Observations	757	977	1734	1734
Prob > Chi <sup>2</sup>	0.000	0.096	0.011	0.000

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: TRANSFERS. Standard errors in parentheses.

Tobit regressions to estimate linear relationships. In Table 2, we report the results of a multivariate Tobit regression on individual characteristics,<sup>15</sup> where we pool all transfers by native Germans in Model (I), immigrants in Model (II), and both groups jointly in models (III) and (IV) as dependent variables.

Among native dictators, we find that the age of decision makers is associated with transfers, as older dictators transfer higher amounts, which is visible from Model (I) in Table 2. The literature on this association is mixed. Some empirical studies show that younger individuals are more in favor of redistribution (Alesina & La Ferrara, 2005; Olivera, 2015), and some experimental studies show that older individuals act more generously (Engel, 2011; Pornpattananangkul, Chowdhury, Feng, & Yu, 2019).

Moreover, we find that native dictators who identify themselves as right-wing transfer lower amounts in the dictator game compared to left-wing native dictators, as has often been reported in the literature (Dawes et al., 2012; Olivera, 2015; Cappelen et al., 2017). In addition, we find

<sup>15</sup> The variable "income" is an ordinal measure. Specifically, we used 5 income brackets based on the actual income data in Germany (Bundesbank, 2016) in case participants did not know their annual gross income precisely.

that native dictators with a higher level of education transfer lower amounts, which supports evidence that higher educated individuals are less supportive of redistribution (Alesina & La Ferrara, 2005). Finally, visible from the coefficient PERFORMANCE, we report that native Germans who performed better in the slider task transfer lower amounts to the allocated receivers. This is in line with literature on entitlement in dictator games (Cherry et al., 2002; Schurter & Wilson, 2009).

Model (II) in Table 2 shows that among immigrants, male and higher income participants act more generously than female and lower income participants. Similar to native dictators, better performing immigrants transfer smaller amounts. Beyond that, we find no relationships between individual characteristics and the amount of transfers in the dictator game among immigrants. Remarkably, we find no difference between first and second generation immigrants in terms of transfers, as the coefficient 1st\_GEN\_MIG indicates. This finding also applies to all other specifications, which is why we exclude this covariate from the following analyses.

Furthermore, we test whether there are level differences between native Germans and immigrants in the overall propensity to transfer. As outlined with coefficient DIC\_NATIVE in Model (III), we find that native dictators are associated with higher transfers, supporting the visual impression from Fig. 2. However, when we add the set of the participants' characteristics in Model (IV), this relationship vanishes.<sup>16</sup> The heterogeneity in overall transfers between native Germans and immigrants seems to be better explained by the discussed differences in demographics between these two groups. In the next step we focus on the actual treatment results.

### 3.2. Equal vs. unequal opportunities and transfers

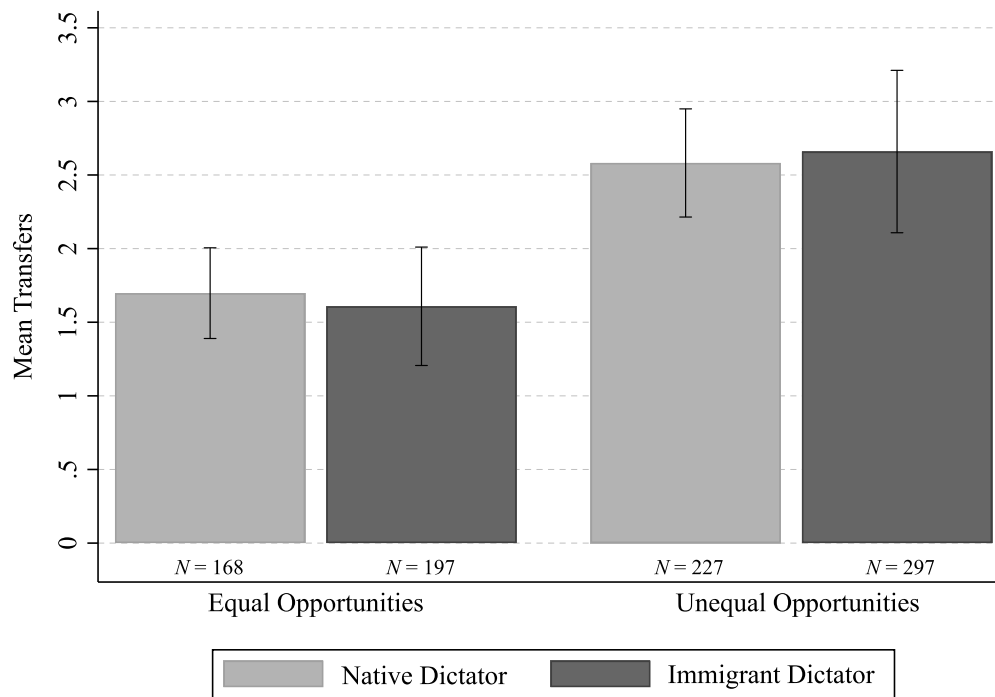
**Result 1.** Native German and immigrant dictators transfer more to in-group receivers under unequal opportunities than under equal opportunities and show a preference to compensate for the general presence of unequal opportunities.

We start by analyzing the results of the first treatment dimension with transfers exclusively to members of the same social group (in-group). This represents a more accurate approach to determine the impact of unequal opportunities on transfers, as it rules out possible confounding social group effects on the willingness to compensate for unequal opportunities when aggregating in-group and out-group transfers.

As it was common knowledge that all participants had a level playing field under equal opportunities, EQOP\_IN measures the general willingness to share one's own payoff with a receiver given the fact that one can only be in the role of a receiver due to insufficient performance. From Fig. 3 and the corresponding 95% confidence bounds, we can infer that transfers under equal opportunities (left bars) are statistically significantly different from zero. Therefore, on average, we find that native Germans and immigrants reveal preferences that are in line with theoretical models, such as inequality aversion, a form of conditional altruism, which contradicts classical theoretical predictions of entirely monetarily self-interested behavior (Fehr & Schmidt, 1999; Bolton & Ockenfels, 2000).<sup>17</sup>

<sup>16</sup> In Table A.17 in the Appendix, we report the results of a Spearman correlation matrix for the set of control variables.

<sup>17</sup> It is reasonable to assume that inequality aversion drives at least part of the results. For instance, Kerschbamer & Müller (2020) report that around two-thirds of a representative German sample exhibit various degrees of inequality aversion. Furthermore, Blanco, Engelman, & Normann (2011) find that inequality aversion can explain outcomes in dictator games on an aggregate level quite well. Nevertheless, we do not explicitly test theories that could potentially rationalize participants' behavior as this does not constitute the research objective of this paper.



**Fig. 3.** Mean in-group transfers between native and immigrant dictators under equal and unequal opportunities in the task. Possible transfers range from € 0 to € 12. The whiskers represent the 95% confidence intervals. Transfers under unequal opportunities contain transfers from dictators with and without bad luck themselves.  $N = 889$  (494 immigrants, 395 native Germans).

**Table 3**

Tobit regression on treatment effects with in-group transfers by native Germans and immigrants with and without bad luck as dependent variables. UNOP is a binary dummy taking the value of 1 for unequal opportunities and 0 for equal opportunities. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native German and 0 if the dictator is an immigrant. DIC\_NATIVE#UNOP is an interaction variable between DIC\_NATIVE and UNOP. Control variables are self-reported age, education, parents' education, gender, income, inhabitants in the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. "Permute  $p$ " reports the  $p$ -values of the corresponding treatment dummy coefficient, obtained from permutation tests with 1,000 random draws.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I)	Model (II)	Model (III)	Model (IV)	Model (V)	Model (VI)
UNOP	1.173*** (0.374)	1.397*** (0.383)	1.591** (0.599)	1.818*** (0.591)	1.490** (0.535)	1.660*** (0.533)
DIC_NATIVE					0.226 (0.452)	0.032 (0.466)
DIC_NATIVE#UNOP					-0.304 (0.651)	-0.231 (0.640)
Constant	0.778*** (0.275)	4.287*** (1.397)	0.218 (0.433)	-0.014 (2.426)	0.500 (0.370)	3.676*** (1.223)
Control Variables	No	Yes	No	Yes	No	Yes
Permute UNOP	0.002	0.001	0.012	0.004	0.000	0.000
Observations	395	395	494	494	889	889
Prob > Chi <sup>2</sup>	0.002	0.004	0.008	0.014	0.001	0.000

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: INGROUP\_TRANSFERS. Standard errors in parentheses.

Moreover, we observe qualitatively similar transfer patterns between the two groups with respect to unequal opportunities as well (see the right bars in Fig. 3). Native Germans and immigrants share more with matched receivers from their own group under unequal opportunities than under equal opportunities.

In order to statistically examine the effect of unequal opportunities on transfers, we run multivariate Tobit regression models with transfers to one's own social group in the dictator game as the dependent variable (see Table 3 for both subject pools separately and for a joint analysis). UNOP is a binary dummy taking a value of 1 for transfers under unequal opportunities and 0 for transfers under equal opportunities. DIC\_NATIVE is a binary dummy taking a value of 1 if the dictator is a native German and 0 if the dictator is an immigrant. DIC\_NATIVE#

UNOP is an interaction variable between DIC\_NATIVE and UNOP. For the main treatment analyses, we pool the dictator decisions of dictators without and with bad luck (i.e., the latter group got a deduction of six sliders) in the task under unequal opportunities.

Supporting the visual impressions from Fig. 3, we find that there is a strong and highly statistically significant effect of unequal opportunities on willingness to transfer among dictators from both subject pools (see coefficient UNOP in models (I) and (III) in Table 3). This effect becomes even slightly more pronounced when we add the set of control variables in models (II) and (IV). Specifically, the regression predicts that native and immigrant dictators are expected to transfer more (native Germans = € 1.40; immigrants = € 1.82) to in-group recipients when unequal initial opportunities are prevalent. Moreover, we do not find a

**Table 4**

Tobit regression on treatment effects with in-group transfers by native Germans and immigrants with and without bad luck as dependent variables. Possible transfers range from € 0 to € 12. UNOP is a binary dummy taking the value of 1 for unequal opportunities and 0 for equal opportunities. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native and 0 if the dictator is an immigrant. DIC\_NATIVE#UNOP is an interaction variable between DIC\_NATIVE and UNOP. Control variables are self-reported age, education, parents' education, gender, income, inhabitants in the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. "Permute *p*" reports the *p* values of the corresponding coefficient, obtained from permutation tests with 1,000 random draws.

	Native Dictator		Immigrant Dictator		Joint	
	Bad Luck		Bad Luck		Bad Luck	
	No	Yes	No	Yes	No	Yes
UNOP	1.295*** (0.411)	1.462* (0.572)	1.263* (0.531)	2.169* (1.009)	1.236* (0.528)	2.474** (0.942)
DIC_NATIVE					0.082 (0.456)	-0.022 (0.465)
DIC_NATIVE#UNOP					0.102 (0.655)	-0.984 (1.023)
Constant	2.919 (1.502)	5.481*** (1.653)	3.152 (1.888)	-2.325 (3.221)	3.226** (1.237)	4.323*** (1.526)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Permute UNOP	0.002	0.004	0.019	0.007	0.001	0.000
Observations	317	246	395	296	712	542
Prob > Chi <sup>2</sup>	0.010	0.099	0.024	0.159	0.002	0.047

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.005. Dependent variable: INGROUP\_TRANSFERS. Standard errors in parentheses.

statistically significant interaction coefficient DIC\_NATIVE#UNOP in models (V) and (VI), which confirms the similar transfer patterns in terms of compensation of unequal opportunities across the two groups shown in Fig. 3.

In addition, as a robustness check, we apply randomization inference and run permutation tests with all specifications from Table 3.<sup>18</sup> We test the null that there are no treatment differences by simulating 1,000 draws of in-group transfer outcomes under EQOP and UNOP based on randomized treatment allocations ex-post and recording the 1,000 treatment effects. The less often the simulated treatment effects are larger than the actual treatment effects, the lower the permutation *p* values for the treatment dummy UNOP (see row "Permute *p* UNOP" in Table 3). The lower these *p* values, the higher the probability (1 - *p*) that the actual treatment allocation caused the observed effect. This probability is equal to or above 98.80% in all 6 specifications, pointing at a strong effect of the presence of unequal opportunities on dictator transfers.

We also analyze whether the coefficient of UNOP is driven by dictators with and without bad luck (i.e., the latter group got a deduction of 6 solved sliders). This is important because pooling transfers from dictators with and without own bad luck and comparing them with transfers under EQOP can be susceptible to confounding effects. Own bad luck might influence preferences for redistribution in various undesirable ways: first, dictators may feel particularly entitled if, despite bad luck, they have reached the threshold for membership in the high-score group (Cherry et al., 2002; Schurter & Wilson, 2009). Second, being affected by bad luck oneself can make the existence of unequal opportunities more tangible through one's own experience and thus make dictators more sensitive to the presence of these unequal opportunities.

Therefore, we run the regression on the influence of unequal opportunities on transfers separately for dictators without bad luck and for dictators with bad luck. Table 4 indicates that even though we lose statistical power when splitting the samples, the positive effects of unequal opportunities on transfers are statistically significantly associated with native and immigrant dictators with and without bad luck. This is confirmed by the results of the randomization inference visible from the row "Permute *p* UNOP". The results shown in row (I) and (III) in Table 4 imply a positive effect of unequal opportunities on transfers, which is causally attributable to preferences to compensate for the presence of

unequal opportunities. This is the case because uncertainty about the opportunities of receivers is the only factor that differs for participants without bad luck under UNOP compared to decision makers under EQOP. Furthermore, we test for differences in transfers under unequal opportunities between dictators with and without bad luck and apply Tobit regressions with the in-group transfers of native German and immigrant dictators and of both groups jointly as dependent variables. The dummy BAD\_LUCK, which equals 1 for dictators with bad luck and 0 for dictators without bad luck, and the set of controls serve as explanatory variables (for details, see Table A.10 in the Appendix). We find that among native dictators the coefficient of BAD\_LUCK (0.32) with *p* = 0.60 (*t* = 0.53, *N* = 227) is statistically insignificant. Therefore, there is no difference in transfers between native dictators with and without bad luck, so we find no statistical evidence of either of the two effects of entitlement or sensitivity to inequality of opportunity discussed. Among immigrants, we also find statistically insignificant differences based on a coefficient of BAD\_LUCK (1.58) with *p* = 0.09 (*t* = 1.68, *N* = 297).

Next, we analyze whether beliefs about the source of inequality are a potential mediator variable that can explain in-group transfers under unequal opportunities. In Table A.11 in the Appendix, we report no statistically significant relationship between beliefs in bad luck (INTERNAL\_BELIEF) and transfers to the in-group among native Germans and immigrants to Germany, also after adding the set of control variables in Model (II). This result implies that the higher transfers of native Germans and immigrants under unequal opportunities are not driven by specific beliefs about the source of inequality, but may reflect a more general norm to compensate for potential factors beyond one's control that are present under UNOP (i.e., the random occurrence of bad luck).

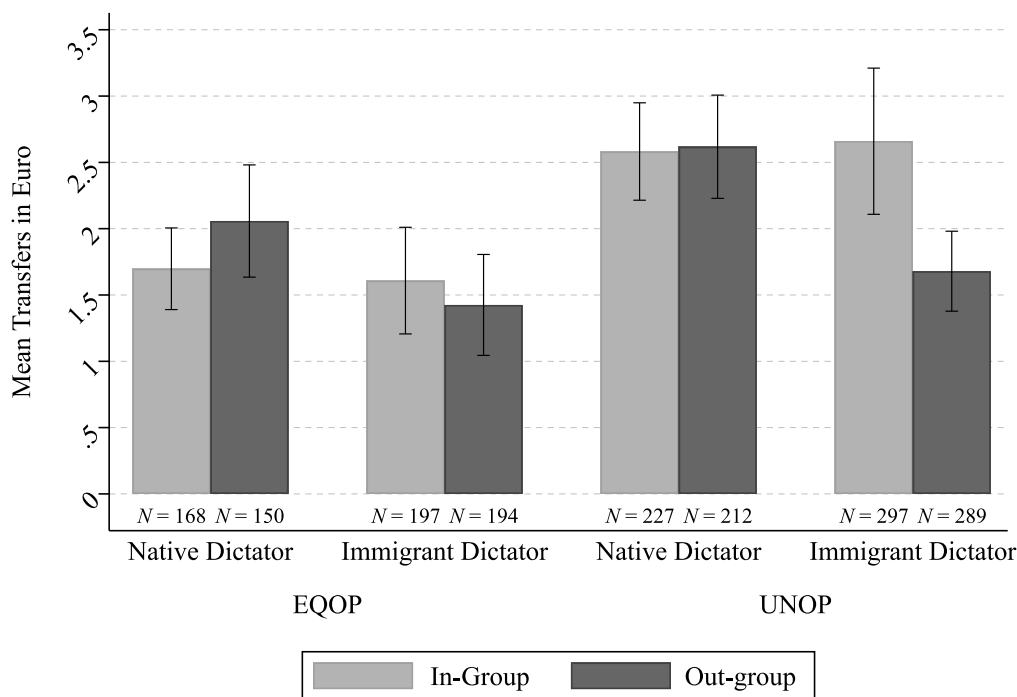
### 3.3. In-group vs. out-group receivers and transfers

**Result 2.** Under equal opportunities, native Germans and immigrants do not distinguish between in- and out-group receivers. Under unequal opportunities, however, transfers are higher to the in-group among immigrant dictators. In contrast to native dictators, immigrant dictators do not compensate for unequal opportunities of the out-group.

In Fig. 4, we combine transfers to members of the in-group (light gray bars) with transfers to members of the out-group (dark gray bars). It is visible that native dictators transfer slightly more to members of the out-

<sup>18</sup> We use the user-written program ritest in Stata (Heß, 2017).





**Fig. 4.** Mean in- and out-group transfers across opportunities in the task and origins of dictators. Possible transfers range from € 0 to € 12. The whiskers represent the 95% confidence intervals.  $N = 1,734$  (977 immigrants, 757 native Germans).

**Table 5**

Tobit regression on social group effects with transfers by native Germans, immigrants and both groups jointly as the dependent variables. Possible transfers range from € 0 to € 12. OUTGROUP is a binary dummy which equals 1 for transfers to out-group members and 0 for transfers to in-group members. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native and 0 if the dictator is an immigrant. DIC\_NAT#OUT is an interaction variable between DIC\_NATIVE and OUTGROUP. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. "Permute  $p$ " reports the  $p$  values of the corresponding coefficient, obtained from permutation tests with 1,000 random draws.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I) EQOP	Model (II) UNOP	Model (III) EQOP	Model (IV) UNOP	Model (V) EQOP	Model (VI) UNOP
OUTGROUP	0.327 (0.381)	0.053 (0.369)	-0.078 (0.472)	-1.317** (0.509)	-0.127 (0.481)	-1.116* (0.482)
DIC_NATIVE					-0.043 (0.440)	-0.274 (0.488)
DIC_NAT#OUT					0.489 (0.619)	1.165 (0.612)
Constant	3.593* (1.414)	4.001** (1.471)	0.280 (1.750)	1.758 (1.812)	3.032* (1.184)	4.011*** (1.201)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Permute OUTGROUP	0.465	0.853	0.660	0.009	0.458	0.002
Observations	318	439	391	586	709	1025
Prob > Chi <sup>2</sup>	0.019	0.001	0.301	0.097	0.022	0.000

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: TRANSFERS. Standard errors in parentheses.

group than to members of the in-group under equal opportunities, while the opposite is true for immigrant dictators.

When opportunities are unequal, transfers by native Germans do not appear to be dependent on the social group affiliation of the receivers. In contrast, transfers by immigrants depend markedly on the social group membership of the transfer recipient, suggesting a statistically significant difference. Furthermore, for immigrants to Germany, the preference to financially compensate for unequal opportunities of receivers reported in Section 3.2 seems to depend crucially on the social group affiliation of the assigned receivers.

We run multivariate Tobit regressions to statistically test for social group effects on transfers with transfers in the dictator game as the dependent variable among both subject pools separately and jointly in a pooled specification and show the results in Table 5. Analogous to Fig. 4,

we split the specifications across EQOP and UNOP. OUTGROUP is a binary dummy which equals 1 for transfers to out-group members and 0 for transfers to in-group members. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native and 0 if the dictator is an immigrant. DIC\_NAT#OUT is an interaction term between DIC\_NATIVE and OUTGROUP.

We find that native German dictators do not differentiate between in-group and out-group receivers under equal and unequal opportunities (see coefficient OUTGROUP in models (I) and (II) in Table 5). We also find that immigrant dictators under equal opportunities do not exhibit such behavior either, which is evident from model (III). However, immigrant dictators transfer statistically significantly higher amounts to members of their in-group compared to members of their out-group under unequal opportunities (see Model (IV) in Table 5). Again, we

additionally conduct permutation tests with all specifications from Table 5 and 1,000 random draws. These results in row “Permute  $p$  OUTGROUP” underpin the regression analyses. Consequently, we cannot support the results on an influence of social identity on redistributive preferences (see e.g., Luttmer, 2001; Klor & Shayo, 2010; Holm & Geys, 2018; Magni, 2020) for native Germans.

We now turn to potential explanations for our results among both groups. A tentative explanation for this non-significant finding could be that the native Germans do not strongly perceive individuals with an immigration background as members of an out-group. Another speculative explanation could be that there exist other unobserved preferences for norm compliance, such as an inclination to signal to the experimenter a non-discriminatory behavior toward the social group of immigrants to Germany, which could counteract the direction of social group effects found in part of the literature. More generally, in a meta-analysis on discrimination in experiments, Lane (2016) finds that discrimination is stronger in studies in which participants are separated into socially or geographically distinct groups or in which group identities are artificially induced than in studies in which samples are split alongside actual nationalities or ethnicities.

The results for immigrants as a minority could reflect solidarity in the experiment, based on their willingness to compensate for the perceived unequal opportunities of their group in society (Vollhardt, Nair, & Tropp, 2016; Cortland et al., 2017; Burson & Godfrey, 2020). Furthermore, the result may also be explained by the immigrants’ beliefs about the source of inequality in the experiment. Fig. A.1 in the Appendix shows the proportion of beliefs in bad luck for native and immigrant dictators, depending on whether the receivers are from the in-group or the out-group. Based on the visual impression, native Germans are slightly less likely to believe in self-inflicted low-score group membership among immigrant recipients than among native German recipients. This would be consistent with experimental evidence showing that native German student participants are more benevolent in responsibility attribution toward refugees compared to native Germans (Grimm & Klimm, 2019). However, immigrants seem to believe disproportionately in bad luck of in-group members compared to bad luck of out-group members. To statistically test for differences, we run logit regressions with native German and immigrant dictators and the dummy INTERNAL.BELIEF as the dependent variable, along with the dummy OUTGROUP and the set of control variables as independent variables (for details, see Table A.13 in the Appendix). We find that among immigrants the coefficient of OUTGROUP (-0.90) is statistically significant with  $p < 0.005$  ( $t = -3.79$ ,  $N = 586$ ). For native Germans, we do not find a statistically significant coefficient of OUTGROUP (0.37) with  $p = 0.08$  ( $t = 1.75$ ,  $N = 439$ ). Combined with the finding that beliefs about bad luck and in-group and out-group transfers are unrelated among immigrants (see Tables A.11 and A.12 in the Appendix), we rule this out as an explanation for the difference between in-group and out-group transfers among immigrants when opportunities are unequal. Another potential explanation for the distinction between in-group and out-group members among immigrants, which we do not find among native Germans, might be that social group membership plays a more important role in the self-definition of members of minorities (Verkuyten & Zaremba, 2005; Verkuyten, 2008; Koh, Shao, & Wang, 2009). This would indicate that immigrants have an emotional connection to other immigrants, while for native Germans such group affiliations play a more minor role and they view all (natives and immigrants) more equally. However, this does not explain why we find differences in immigrants’ in-group and out-group transfers exclusively when opportunities are unequal. This argues most strongly for the first mentioned theory, of a preference to compensate for the perceived unequal opportunities in society. Overall, when we combine the data of both groups in models (V) and (VI) in Table 5, we find no statistically significant difference between native Germans and immigrants in the propensity to adopt different behavior toward in-group and out-group members (DIC.NAT#OUT) under equal and unequal opportunities, although the

effect under unequal opportunities in Model (VI) approaches conventional levels of significance ( $p = 0.057$ ), and thus, can only be interpreted as suggestive evidence.<sup>19</sup>

Finally, as one of our main research questions, we statistically test whether participants compensate for the presence of unequal opportunities when they are matched with in- and out-group members. We conduct Tobit regressions on treatment dummies with transfers by native Germans and immigrants and both groups jointly as the dependent variables and report the results in Table A.4 in the Appendix. EQOP\_OUT indicates the out-group transfers under equal opportunities, and EQOP\_IN, representing the in-group transfers under equal opportunities, serves as the reference category in the models. UNOP\_IN and UNOP\_OUT represent the in- and out-group transfers under unequal opportunities, respectively. The findings are consistent with Result 1. Furthermore, we confirm the visual impression in Fig. 4. The post-estimation Wald tests in Model (II) and Model (IV) show that only native dictators compensate for unequal opportunities of the out-group (EQOP\_OUT vs. UNOP\_OUT).

#### 4. Discussion and conclusion

In this paper we presented the results of a large-scale online experiment with a real-effort task and a subsequent dictator game. The goal was to examine the influence of unequal opportunities, social group membership of receivers, and their interaction on preferences for redistribution of native Germans and immigrants to Germany.

With respect to the influence of unequal opportunities, we found that dictators from both groups redistributed statistically significantly more to members of their own group in the presence of unequal opportunities than under equal opportunities. With respect to the influence of social group affiliations, we found that for both groups—native Germans and immigrants—dictators’ transfers between recipients of the in-group and the out-group were not distinguishable under equal opportunities. This also applied to transfers by native dictators under unequal opportunities. We found, however, that immigrant dictators under unequal opportunities transferred statistically significantly more to in-group receivers than to out-group receivers. Moreover, immigrants did not compensate for the presence of unequal opportunities when matched with out-group recipients, but native Germans did. Taken together, the results provide new insights into preferences for redistribution. We reported that natives and immigrants to Germany share common characteristics, such as the preference to compensate for the existence of unequal opportunities at least for their own social group. As the key new findings, however, we reported that the transfer decisions of immigrants to Germany, but not of native Germans, differed in terms of the receivers’ social group affiliation under unequal opportunities. Further we reported that the existence of unequal opportunities for out-group members is compensated only by native Germans but not by immigrants to Germany.

These results mainly contribute to two strands of literature. First, by varying individual opportunities in the real-effort task, we contribute to the strand on attitudes toward unequal opportunities. The underlying concept of “equality of opportunity” is commonly based on two principles, namely, the principle of compensation and the principle of reward. The former states that inequality of outcomes (e.g., income or wealth) that arises from circumstances beyond one’s control is due to inequality of opportunities (e.g., gender, family background, or location of birth) and should be removed. The latter principle states that this is not the case for inequality of outcomes that arises due to differences in choices and effort (Fleurbay & Peragine, 2013; Ferreira & Peragine, 2015; Brunori, 2017). Usually, differences in economic outcomes can be

<sup>19</sup> The only qualitative difference between the truncated sample that we analyze in this results section and the full sample is a statistically significant coefficient DIC.NAT#OUT, which can be seen in Table A.7 in the Appendix.

seen as the result of an individuals choices and effort, but also to the varying extent of differences in opportunities (Brunori, Ferreira, & Peragine, 2013). Some scholars argue that the nature of inequality can be understood more adequately if we appreciate the extent to which inequality is caused by factors beyond one's control (Dworkin, 1981a, 1981b; Roemer, 2002; Corak, 2016). Piketty (1995) provides a rational-learning theory that explains the influence of beliefs in individual effort versus predetermined factors not in one's control as the primary determinant of success on attitudes toward inequality. Similarly, Alesina & Angeletos (2005) develop a model that results in multiple equilibria regarding redistribution, based on different beliefs on the sources of inequality. Built on Fehr & Schmidt (1999), who propose a model of outcome fairness, Trautmann (2009) introduces a framework for process fairness and shows that the model explains observed empirical patterns in random ultimatum games. These contributions suggest that differences in the generating process (i.e., the source) of inequality can lead to differences in the normative acceptance of inequality. Existing empirical and experimental literature confirms that individuals categorize not all inequality as undesired. Nevertheless, when individuals know (or believe) that inequality exists due to circumstances beyond one's control (in contrast to a lack of individual effort), they tend to support redistribution in surveys more often (Fong, 2001; Alesina & La Ferrara, 2005; Jencks & Tach, 2006; Alesina, Giuliano, Bisin, & Benhabib, 2011) and act differently in experiments (Krawczyk, 2010; Caballero, 2014; Durante et al., 2014; Mollerstrom, Reme, & Sørensen, 2015; Alan & Ertac, 2017; Alesina, Stantcheva, & Edoardo, 2018; Bartling, Cappelen, Ekström, Sørensen, & Tungodden, 2018; Rey-Biel et al., 2018; Akbaş et al., 2019).

Moreover, Cappelen, Konow, Sørensen, & Tungodden (2013) provide evidence that choices involving risk play a role in fairness preferences as well. The authors show that inequalities between lucky and unlucky risk takers are generally eliminated, while inequalities between risk takers and risk averse participants are not eliminated, which is consistent with the principles of compensation and reward. In related experimental work, Mollerstrom et al. (2015) show that impartial spectators on average eliminate inequality due to uncontrollable bad luck. Nevertheless, the authors also show that seemingly unrelated choices of receivers regarding another controllable risk strongly influence the degree of compensation of uncontrollable bad luck. Consequently, the causes of inequality, but also the choices of beneficiaries, whether or not they are directly related, seem to be relevant for redistributive preferences.<sup>20</sup>

Based on a large sample of the German population, we contribute to this literature on unequal opportunities by examining the generalizability of some of the results of previous laboratory studies with student participants. In particular, we hypothesized to find that the presence of unequal opportunities increases the willingness to redistribute among native Germans and immigrants to Germany. This was supported by the data. We reported that this effect is based on the general existence of circumstances beyond one's control, without precise information about the specific reason for inequality (bad luck vs. insufficient performance) of the allocated receivers. We presented evidence that argues to some extent for the relevance of the principle of compensation among native Germans and immigrants. Regarding the influence of beliefs, we found that redistributive decisions of natives and immigrants were not mediated by beliefs about the specific source of inequality.

We introduced dictator decisions where participants' earned payoffs

in a real-effort task were at stake. In doing so, we abstracted less from reality than by utilizing other approaches, such as games with windfall endowments (random allocation) or spectator decisions. The particular reason for the latter was to rule out the documented phenomenon of "cheap talk" in redistribution preferences without actual payoff consequences for oneself (Engelhardt & Wagener, 2018). As the authors aptly put it: "People hold cherished views on how large inequality is and ought to be, and they do not change these "expressive" views until they are given reason to think through its consequences for themselves" (Engelhardt & Wagener, 2018, p. 758). Further, regarding the former, Cherry et al. (2002) and Schurter & Wilson (2009) show that dictators behave more in accordance with game-theoretic predictions, thus, act more self-centered, when the stakes in the dictator game are earned rather than simply given by the experimenter.

At first glance, our results contrast with a recent study by Fehr, Müller, & Preuss (2020). In a survey experiment in Germany, the authors find that a successful shift in perceptions toward lower but more accurate levels of social mobility in society, i.e., toward more inequality of opportunity, does not affect either distributional preferences or pro-social attitudes toward the poor and the rich. The authors note, however, that they find no evidence that beliefs about the role of luck in society correlate with perceived inequality of opportunity in their control group. The authors conclude that participants are unlikely to view information about lower social mobility in Germany as evidence that factors beyond one's control predominantly determine the rigidity of the economic distribution, which might explain the absence of an effect. Our experiment shows that if there is information about the presence of bad luck – a factor out of one's own control, this increases revealed pro-social attitudes toward financially worse off participants.

Second, we contribute to the literature on the effects of social identity on behavior toward others. The existing literature suggests that individuals base their feelings of who they are on the groups they belong to or identify with (Sniderman et al., 2004; Markaki & Longhi, 2013). Accompanied by a striving for social dominance (Pratto, Sidanius, & Levin, 2006), such group categorizations induce perceptual effects that promote the adaption of beliefs in negative out-group traits (Schaller, 1991; Glynn, 1997), which can lead to a differential treatment of in- and out-group members (Fiske, Cuddy, Glick, & Xu, 2002; Charness, Rigotti, & Rustichini, 2007; Cuddy, Fiske, & Glick, 2007; Chen & Li, 2009; Abbink & Harris, 2019; Cettolin & Suetens, 2019). Heidhues, Koszegi, & Strack (2019) provide a theoretical explanation for such beliefs by showing that overconfidence, which is widespread empirically (Svenson, 1981), leads to a tendency to explain one's bad outcomes by discriminatory behavior against oneself or one's in-group rather than by a lack of one's ability compared to others. In addition, theoretical, experimental, and empirical work on social identification suggests that social identity exerts an influence on preferences for redistribution (Luttmer, 2001; Bernhard, Fehr, & Fischbacher, 2006; Shayo, 2009; Klor & Shayo, 2010; Lindqvist & Östling, 2013; Holm & Geys, 2018; Magni, 2020). We add to this literature by varying the actual social group membership of receivers in decisions on redistribution. Incorporating natural group identities instead of inducing trivial identities such as "blue group and red group" allowed us to arrive at a more realistic picture of the impact of social group effects on redistribution in society. We reported that native Germans and immigrants to Germany partially exhibit heterogeneous attitudes toward out-groups when it comes to redistributing earned money. By interacting the two dimensions of equality of opportunities and social group membership we found that native Germans but not immigrants compensate for unequal opportunities of the other group. Thus, we provided evidence that, conditional on whether equal or unequal opportunities prevail, certain subgroups of the German population, such as immigrants, are influenced in their redistributive decisions by the recipient's affiliation to a social group, while this is not the case for others (native Germans). Thereby, we could not confirm the findings in Magni (2020). However, the mechanism described by Magni (2020) seems to reflect the behavior among the

<sup>20</sup> In addition to fairness considerations, Aiyar & Ebeke (2019) argue that unequal opportunities could potentially exert an influence on economic growth, because the growth-inhibiting effects of inequality might be mediated by actually present inequality of opportunities, thus possibly providing an explanation for the partially mixed results regarding the influence of inequality on growth (Perotti, 1996; Patridge, 1997; Figini, 1999; Berg, Ostry, Tsangarides, & Yakshilikov, 2018).

minority group - the immigrants.

In addition to examining the interaction of unequal opportunities and social identity, what distinguishes this study crucially from most of the cited literature is the fact that previous studies mainly involved student experiments and artificially induced social groups in the laboratory. We presented evidence that the results of the majority of empirical studies on the influence of unequal opportunities on redistribution also apply to post-stratified samples of native Germans and immigrants to Germany.

A possible limitation of our study is that we did not invite EU immigrants. The aim was to achieve a clearer out-group framing of native

Germans among immigrants. Thus, our sample of immigrants is only representative of the respective strata of non-EU immigrants to Germany and the findings may not apply to the same extent to immigrants from countries that are geographically and culturally closer to Germany. Also note that we measured the redistributive decisions in a specific time period (between February and June 2019). As the perception of inequality of opportunities and social groups in real life can change over time, we cannot exclude that our results are at least partly affected by the prevailing sentiments and narratives in the population at the time of the experiment.

## Appendix A

### A.1. Other exploratory results

In this section of the Appendix we investigate whether political preferences, determinants of economic success in life, out-group stereotypes and social ties can explain transfers in the dictator game. After the experiment, we administered a questionnaire on attitudes toward economic success in life and social groups, as well as a series of demographic data including a question on political preferences. This questionnaire forms the basis for the exploratory results in this section of the Appendix. Specifically, we asked both groups about their perception of native Germans in terms of competence (COMPETENCE\_NAT), self-confidence (CONFIDENCE\_NAT), warmth (WARMTH\_NAT), honesty (HONESTY\_NAT), success (SUCCESS\_NAT), and education (EDUCATION\_NAT), and about their perception of immigrants in terms of their competence (COMPETENCE\_IMM), their self-confidence (CONFIDENCE\_IMM), their warmth (WARMTH\_IMM), their honesty (HONESTY\_IMM), their success (SUCCESS\_IMM) and their education (EDUCATION\_IMM) on 7-point Likert scales (Fiske et al., 2002).

On the basis of the international social survey program (Gimpelson & Monusova, 2014) we also gathered perceptions of upward social mobility by asking which circumstances or characteristics the participants considered relevant determinants of economic success in life. The variables WEALTHY\_FAMILY, EDUCATED\_PARENTS, EDUCATED, AMBITIOUS, HARD\_WORK, RIGHT\_PEOPLE characterize the perceived importance of being born into a wealthy family, having educated parents, being educated, being ambitious, working hard, and knowing the right people to have economic success in life on 5-point Likert scales. In addition, we asked questions about the social ties regarding the respective out-group in the public (TIES\_NAT\_PUB; TIES\_IMM\_PUB), professional (TIES\_NAT\_PROF; TIES\_IMM\_PROF) and private (TIES\_NAT\_PRIV; TIES\_NAT\_PRIV) domains on 5-point Likert scales (Eurobarometer, 2018). The specific wording of these questions can be found in the instructions in this Appendix.

First, we analyze whether political preferences have an impact on transfers. In Table A.9 we show the results of the Tobit regressions we conduct on political preferences with in- and out-group transfers of native Germans and immigrants across equal and unequal opportunities as dependent variables. We exclude political preferences from the set of control variables in the regressions and report point estimates instead. Specifically, the dummy variable POL\_LEFT represents dictators who describe themselves as politically left (Likert scale < 4), while the dummy variable POL\_RIGHT represents dictators who describe themselves as politically right (Likert scale > 4) on a 7-point Likert scale from left to right. The reference category is contained in the constant (Likert scale = 4). As shown in Table A.9 and the post-estimation Wald test in row two, we find that politically left-wing native dictators transfer more to out-group members than politically right-wing native dictators under the aspect of equal opportunities. Under unequal opportunities we find that native dictators who identify themselves as leftist transfer more to members of the out-group than those who identify themselves in the political center, which serves as a reference category. From the post-estimation Wald test reported in row four, we can deduce that left-wing dictators also transfer statistically significantly more to out-group members than those who identify themselves as right-wing. This result could indicate a solidarity with immigrants to Germany by leftist native dictators and reflects results, which show that political preferences are linked to attitudes toward the welfare state and increasingly toward social groups (De Vries, Hakhverdian, & Lancee, 2013; Otto & Steinhardt, 2014; Halla et al., 2017; Edo, Giesing, Öztunc, & Poutvaara, 2019). For immigrant dictators Among immigrants we do not find any association between political preferences and transfer decisions.

Second, we analyze whether attitudes toward upward social mobility, which have been empirically demonstrated to co-determine attitudes toward inequality (Gimpelson & Monusova, 2014), play a role in shaping in-group transfers for equal and unequal opportunities among native Germans and immigrants to Germany. Table A.14 in the Appendix contains the results of Tobit regressions with transfers to the in-group as a dependent variable and the six covered instruments of upward social mobility as explanatory variables. We find that world views on determinants of economic success have no association with transfers among native Germans. Immigrants who believe that hard work is a relevant determinant of success share statistically significantly lower amounts under equal opportunities, which is partly contradictory to the positive sign of the coefficient AMBITIOUS. We test for multicollinearity by calculating Variance Inflation Factors (VIFs), which indicate that multicollinearity is not a concern (the VIFs of all independent variables in all four specifications are below 2).

In further exploratory analyses, we investigate the influence of real social contact with members of the out-group on the willingness to transfer to recipients of the out-group in the dictator game. Table A.15 in the Appendix shows that native Germans transfer highly statistically significantly lower amounts to out-group members under unequal opportunities when they report having more social contacts with immigrants in public space. We do not find any influence of real social contact on transfers among immigrants.

Furthermore, we investigate the relationship between self-reported out-group perceptions along the dimensions of competence and warmth and out-group transfers in the dictator game. In Table A.16 in the Appendix we report that native dictators who perceive immigrants as more self-confident transfer significantly lower amounts of money to immigrants in the dictator game under unequal opportunities. Among immigrants we find a rather contradictory effect. Immigrant dictators, who perceive natives as warmer, transfer statistically significantly lower amounts to natives under unequal opportunities. Under equal opportunities, immigrant dictators share more with native German receivers if they perceive native Germans as more successful. We calculate the variance inflation factors (VIF) and multicollinearity does not seem to be a major problem (the VIF's of all independent variables in all four specifications are below 4.7).

A2. Additional figures and tables

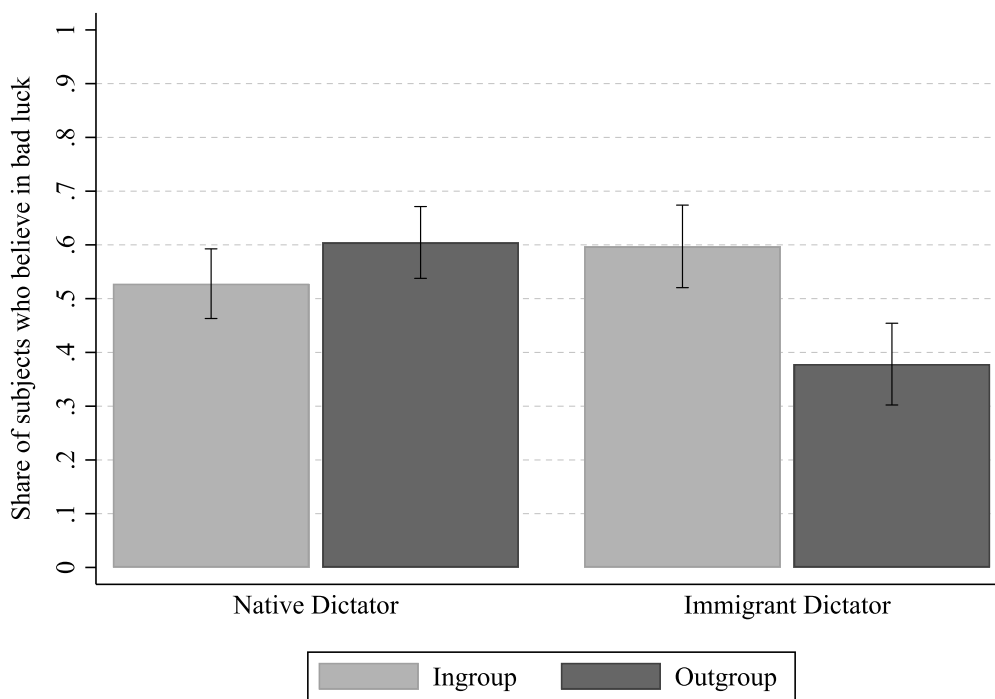


Fig. A1. Fraction of participants under unequal opportunities who believe that the decisive reason why their allocated receiver did not receive any payoff for the task was bad luck. The whiskers represent the 95% confidence intervals.

Table A1

Sample balancing checks of demographic variables across treatments. AGE represents the participants age in years. The variable POL\_LEFT-RIGHT represents a 7-point Likert scale on political preferences from left to right. MALE represents a dummy variable for gender taking a value of 1 for male participants and 0 for female participants. INCOME indicates the self-reported income of participants on a 5-point scale. INHABITANTS indicates the number of inhabitants of the participants' town of residence. EDUCATION and EDUCATION\_PARENTS represent the education level of the participant and her parents, respectively. STATE\_OF\_RESIDENCY is a categorical variable indicating the self-reported state of residence of participants in Germany. PROFESSION is a categorical variable indicating self-reported profession of participants. PERFORMANCE represents the number of solved sliders in the task.

Group	Variable	Test	Test-Statistic	N
Native	INCOME	Kruskal-Wallis Test	$chi^2 = 2.76$	757
Immigrant	INCOME	Kruskal-Wallis Test	$chi^2 = 1.73$	977
Native	MALE	Pearsons $\chi^2$ Test	$chi^2 = 0.24$	757
Immigrant	MALE	Pearsons $\chi^2$ Test	$chi^2 = 0.95$	977
Native	POL_LEFT-RIGHT	Kruskal-Wallis Test	$chi^2 = 8.15^*$	757
Immigrant	POL_LEFT-RIGHT	Kruskal-Wallis Test	$chi^2 = 1.00$	977
Native	EDUCATION	Kruskal-Wallis Test	$chi^2 = 7.56$	757
Immigrant	EDUCATION	Kruskal-Wallis Test	$chi^2 = 0.93$	977
Native	EDUCATION_PARENTS	Kruskal-Wallis Test	$chi^2 = 7.74$	757
Immigrant	EDUCATION_PARENTS	Kruskal-Wallis Test	$chi^2 = 1.65$	977
Native	STATE_OF_RESIDENCY	Pearsons $\chi^2$ Test	$chi^2 = 51.57$	757
Immigrant	STATE_OF_RESIDENCY	Pearsons $\chi^2$ Test	$chi^2 = 41.14$	977
Native	INHABITANTS	Kruskal-Wallis Test	$chi^2 = 5.24$	757
Immigrant	INHABITANTS	Kruskal-Wallis Test	$chi^2 = 2.30$	977
Native	PROFESSION	Pearsons $\chi^2$ Test	$chi^2 = 14.39$	757
Immigrant	PROFESSION	Pearsons $\chi^2$ Test	$chi^2 = 22.11$	977
Native	AGE	Kruskal-Wallis Test	$chi^2 = 4.94$	757
Immigrant	AGE	Kruskal-Wallis Test	$chi^2 = 0.45$	977
Native	PERFORMANCE	Kruskal-Wallis Test	$chi^2 = 32.89^{***}$	757
Immigrant	PERFORMANCE	Kruskal-Wallis Test	$chi^2 = 14.87^{***}$	977

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ .

**Table A2**

Descriptive statistics on the number of solved sliders by native Germans and immigrant dictators across treatments. Solvable sliders range from 0 to 48. EQOP\_IN and UNOP\_IN indicate the treatments were native and immigrant dictators can transfers to participants from the same social group under equal opportunities and unequal opportunities. EQOP\_OUT and UNOP\_OUT indicate the treatments were native and immigrant dictators can transfers to participants from the other social group under equal opportunities and unequal opportunities.

Solved Sliders	Obs	Mean	SD	Median
Overall	1734	17.30	5.41	16
Native Germans	757	17.17	5.52	16
Immigrants	977	17.40	5.33	17
<b>Native Germans</b>	Obs	Mean	SD	Median
EQOP_IN	168	16.22	5.27	15
UNOP_IN	227	18.06	5.88	17
EQOP_OUT	150	15.63	4.92	15
UNOP_OUT	212	18.05	5.39	17
<b>Immigrants</b>	Obs	Mean	SD	Median
EQOP_IN	197	16.41	5.44	15
UNOP_IN	297	17.75	5.27	17
EQOP_OUT	194	17.24	5.27	17
UNOP_OUT	289	17.84	5.30	17

**Table A3**

Tests for differences in demographic variables between native Germans and immigrants. AGE represents the participants age in years. The variable POL\_LEFT-RIGHT represents a 7-point Likert scale on political preferences from left to right. MALE represents a dummy variable for gender taking a value of 1 for male participants and 0 for female participants. INCOME indicates the self-reported income of participants on a 5-point scale. INHABITANTS indicates the number of inhabitants of the participants' town of residence. EDUCATION and EDUCATION\_PARENTS represent the education level of the participant and her parents, respectively. STATE\_OF\_RESIDENCY is a categorical variable indicating the self-reported state of residence of participants in Germany. PROFESSION is a categorical variable indicating self-reported profession of participants.

Variable	Test	Test-Statistic	N
INCOME	Kruskal-Wallis Test	$\chi^2 = 82.92^{***}$	1734
MALE	Pearsons $\chi^2$ Test	$\chi^2 = 30.36^{***}$	1734
POL_LEFT-RIGHT	Kruskal-Wallis Test	$\chi^2 = 7.67^{**}$	1734
EDUCATION	Kruskal-Wallis Test	$\chi^2 = 34.26^{***}$	1734
EDUCATION_PARENTS	Kruskal-Wallis Test	$\chi^2 = 8.20^{***}$	1734
STATE_OF_RESIDENCY	Pearsons $\chi^2$ Test	$\chi^2 = 125.73^{***}$	1734
INHABITANTS	Kruskal-Wallis Test	$\chi^2 = 50.71^{***}$	1734
PROFESSION	Pearsons $\chi^2$ Test	$\chi^2 = 293.20^{***}$	1734
AGE	Kruskal-Wallis Test	$\chi^2 = 427.59^{***}$	1734
PERFORMANCE	Kruskal-Wallis Test	$\chi^2 = 2.25$	1734

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ .

**Table A4**

Tobit regression on treatment dummies with transfers by native Germans and immigrants and both groups jointly as the dependent variables. Possible transfers range from € 0 to € 12. EQOP\_OUT indicates the out-group transfers under equal opportunities, and EQOP\_IN, the in-group transfers under equal opportunities, serves as the reference category in the models. UNOP\_IN and UNOP\_OUT represent the in- and out-group transfers under unequal opportunities, respectively. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. The post-estimation Wald tests show  $p$  values.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I)	Model (II)	Model (III)	Model (IV)	Model (V)	Model (VI)
EQOP_OUT	0.532 (0.422)	0.387 (0.403)	-0.235 (0.524)	-0.118 (0.511)	0.396 (0.364)	0.301 (0.348)
UNOP_IN	1.187*** (0.379)	1.324*** (0.381)	1.514** (0.553)	1.668*** (0.547)	1.241*** (0.330)	1.408*** (0.330)
UNOP_OUT	1.270*** (0.387)	1.342*** (0.381)	0.199 (0.463)	0.303 (0.469)	1.086*** (0.334)	1.219*** (0.329)
Constant	0.727** (0.276)	2.992*** (1.054)	0.434 (0.381)	0.106 (1.361)	0.676** (0.241)	2.652*** (0.878)
Control Variables	No	Yes	No	Yes	No	Yes
Observations	757	757	977	977	1734	1734
Prob > Chi <sup>2</sup>	0.002	0.000	0.010	0.014	0.000	0.000
<i>Post Estimation Wald-Tests:</i>						
UNOP_IN vs. UNOP_OUT	0.828	0.961	0.008	0.005	0.637	0.549
EQOP_OUT vs. UNOP_OUT	0.084	0.019	0.347	0.355	0.059	0.008

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: TRANSFERS. Standard errors in parentheses.

**Table A5**

Tobit regression on treatment dummies with transfers by native Germans and immigrants and both groups jointly as the dependent variables (full sample). Possible transfers range from € 0 to € 12. EQOP\_OUT indicates the out-group transfers under equal opportunities, and EQOP\_IN, the in-group transfers under equal opportunities, serves as the reference category in the models. UNOP\_IN and UNOP\_OUT represent the in- and out-group transfers under unequal opportunities, respectively. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. The post-estimation Wald tests show *p* values.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I)	Model (II)	Model (III)	Model (IV)	Model (V)	Model (VI)
EQOP_OUT	0.357 (0.436)	0.214 (0.419)	0.125 (0.495)	0.194 (0.482)	0.308 (0.373)	0.218 (0.358)
UNOP_IN	1.035** (0.380)	1.180*** (0.382)	1.340** (0.489)	1.443*** (0.480)	1.084*** (0.327)	1.254*** (0.327)
UNOP_OUT	1.310*** (0.392)	1.416*** (0.388)	0.243 (0.441)	0.286 (0.442)	1.122*** (0.337)	1.276*** (0.332)
Constant	0.819*** (0.281)	2.461* (1.070)	0.438 (0.355)	0.182 (1.155)	0.752*** (0.244)	2.305** (0.861)
Control Variables	No	Yes	No	Yes	No	Yes
Observations	867	867	1071	1071	1938	1938
Prob > Chi <sup>2</sup>	0.003	0.000	0.021	0.006	0.001	0.000
<i>Post Estimation Wald-Tests:</i>						
UNOP_IN vs. UNOP_OUT	0.470	0.512	0.012	0.007	0.907	0.944
EQOP_OUT vs. UNOP_OUT	0.029	0.004	0.789	0.834	0.028	0.003

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.005. Dependent variable: TRANSFERS. Standard errors in parentheses.

**Table A6**

Tobit regression on treatment effects with in-group transfers by native Germans and immigrants with and without bad luck as dependent variables (full sample). UNOP is a binary dummy taking the value of 1 for unequal opportunities and 0 for equal opportunities. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native German and 0 if the dictator is an immigrant. DIC\_NATIVE#UNOP is an interaction variable between DIC\_NATIVE and UNOP. Control variables are self-reported age, education, parents' education, gender, income, inhabitants in the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. "Permute *p*" reports the *p*-values of the corresponding treatment dummy coefficient, obtained from permutation tests with 1,000 random draws.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I)	Model (II)	Model (III)	Model (IV)	Model (V)	Model (VI)
UNOP	1.019** (0.373)	1.287*** (0.377)	1.387** (0.515)	1.534*** (0.503)	1.337** (0.483)	1.515*** (0.482)
DIC_NATIVE					0.417 (0.440)	0.151 (0.453)
DIC_NATIVE#UNOP					-0.313 (0.607)	-0.216 (0.594)
Constant	0.886*** (0.277)	4.024*** (1.380)	0.314 (0.385)	0.716 (1.885)	0.446 (0.355)	3.573*** (1.147)
Control Variables	No	Yes	No	Yes	No	Yes
Permute UNOP	0.008	0.001	0.011	0.002	0.003	0.000
Observations	455	455	546	546	1001	1001
Prob > Chi <sup>2</sup>	0.006	0.001	0.007	0.007	0.001	0.000

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.005. Dependent variable: INGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A7**

Tobit regression on social group effects with transfers by native Germans, immigrants and both groups jointly as the dependent variables (full sample). Possible transfers range from € 0 to € 12. OUTGROUP is a binary dummy which equals 1 for transfers to out-group members and 0 for transfers to in-group members. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native and 0 if the dictator is an immigrant. DIC\_NATIVE#OUT is an interaction variable between DIC\_NATIVE and OUTGROUP. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of correctly positioned sliders in the real-effort task. "Permute *p*" reports the *p* values of the corresponding coefficient, obtained from permutation tests with 1,000 random draws.

	Native Dictator		Immigrant Dictator		Joint	
	Model (I) EQOP	Model (II) UNOP	Model (III) EQOP	Model (IV) UNOP	Model (V) EQOP	Model (VI) UNOP
OUTGROUP	0.169 (0.401)	0.264 (0.364)	0.192 (0.468)	-1.089* (0.440)	0.156 (0.487)	-0.917* (0.436)
DIC_NATIVE					0.224 (0.445)	-0.128 (0.435)
DIC_NATIVE#OUT					0.053 (0.634)	1.167* (0.572)
Constant	2.191 (1.574)	3.899** (1.439)	-0.839 (1.736)	2.525 (1.510)	1.554 (1.304)	4.081*** (1.141)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Permute OUTGROUP	0.755	0.417	0.815	0.026	0.765	0.005
Observations	359	508	426	645	785	1153
Prob > Chi <sup>2</sup>	0.056	0.000	0.188	0.042	0.080	0.000

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.005. Dependent variable: TRANSFERS. Standard errors in parentheses.

**Table A8**

OLS regression with number of solved sliders by native Germans, immigrants, and both groups jointly as the dependent variables. Solvable transfers range from 0 to 48. AGE represents the participants' age in years. The variable POL\_LEFT-RIGHT represents a 7-point Likert scale on political preferences from left to right, with higher numbers indicating stronger preferences toward the right-wing political spectrum. MALE represents a dummy variable for gender taking a value of 1 for male participants and 0 for female participants. INCOME indicates the self-reported income of participants on a 5-point scale. INHABITANTS indicates the number of inhabitants of the participants' town of residence. EDUCATION and EDUCATION.PARENTS represent the education level of the participant and her parents, respectively, with higher values indicating higher education. 1st\_GEN\_MIG is a binary dummy taking the value of 1 for transfers by first-generation immigrants and 0 for transfers by second-generation immigrants. DIC\_NATIVE is a binary dummy taking the value of 1 if the dictator is a native German and 0 if the dictator is an immigrant.

	Native Dictator Model (I)	Immigrant Dictator Model (II)	Joint Model (III)
AGE	-0.138*** (0.010)	-0.070*** (0.016)	-0.111*** (0.008)
MALE	1.190** (0.301)	1.080** (0.357)	1.243** (0.230)
INCOME	0.209 (0.124)	0.323* (0.135)	0.347** (0.090)
POL_LEFT-RIGHT	-0.328* (0.129)	-0.708*** (0.114)	-0.559*** (0.086)
EDUCATION	0.535*** (0.116)	0.303* (0.133)	0.416*** (0.087)
EDUCATION_PARENTS	-0.069 (0.107)	0.119 (0.091)	0.080 (0.068)
INHABITANTS	0.058 (0.107)	0.465*** (0.131)	0.230** (0.083)
1st_GEN_MIG		0.171 (0.385)	
DIC_NATIVE			1.328*** (0.283)
Constant	14.747*** (1.029)	11.051*** (0.998)	11.949*** (0.690)
Observations	1996	2039	4035
Prob > F	0.000	0.000	0.000

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: PERFORMANCE. Standard errors in parentheses.

**Table A9**

Tobit regression on the effects of political preferences on transfers across equal and unequal opportunities with in- and out-group transfers by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. The dummy POL\_LEFT represents individuals who describe themselves as left-wing (Likert scale < 4), whereas the dummy POL\_RIGHT represents individuals who describe themselves as right-wing (Likert scale > 4) on a 7-point Likert scale from left to right. Control variables are self-reported age, education, parents' education, gender, income, inhabitants in the town of residency, and the number of solved sliders in the real-effort task. The post-estimation Wald test shows  $p$  values.

	Native Dictator				Immigrant Dictator			
	Equal Opportunities		Unequal Opportunities		Equal Opportunities		Unequal Opportunities	
	In-group	Out-group	In-group	Out-group	In-group	Out-group	In-group	Out-group
POL_LEFT	0.384 (0.607)	1.268 (0.676)	0.833 (0.553)	1.234* (0.586)	0.205 (0.758)	0.132 (0.750)	-0.068 (0.707)	0.270 (0.525)
POL_RIGHT	-0.777 (0.613)	-0.927 (0.861)	0.206 (0.814)	-0.974 (0.767)	0.168 (0.854)	0.443 (0.689)	1.182 (1.431)	0.107 (0.681)
Constant	2.834 (1.564)	0.673 (1.769)	3.659* (1.727)	0.604 (1.992)	1.284 (2.406)	0.677 (1.903)	1.881 (2.481)	-0.817 (1.620)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	168	150	227	212	197	194	297	289
Prob > Chi <sup>2</sup>	0.273	0.046	0.066	0.008	0.348	0.461	0.107	0.595
Post Estimation Wald-Test: POL_LEFT vs. POL_RIGHT	0.093	0.023	0.446	0.004	0.966	0.724	0.391	0.824

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: TRANSFERS. Standard errors in parentheses.



**Table A10**

Tobit regression with in- group transfers under UNOP by native Germans, immigrants, and both groups jointly as the dependent variables. Possible transfers range from € 0 to € 12. BAD\_LUCK is a dummy variable that takes the value of 1 if participants had bad luck in the task themselves and 0 if they had no bad luck in the task themselves. Control variables are self-reported age, education, parent’s education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator Model (I)	Immigrant Dictator Model (II)	Joint Model (III)
BAD_LUCK	0.323 (0.610)	1.583 (0.943)	0.579 (0.550)
Constant	6.083*** (2.061)	1.797 (2.686)	5.469*** (1.702)
Control Variables	Yes	Yes	Yes
Observations	227	297	524
Prob > Chi <sup>2</sup>	0.073	0.089	0.025

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: TRANSFERS. Standard errors in parentheses.

**Table A11**

Tobit regression with in- group transfers by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. INTERNAL\_BELIEF is a dummy variable that takes the value of 1 if participants believe in bad luck of the allocated receivers and 0 if they believe in a lack of performance. Control variables are self-reported age, education, parent’s education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator		Immigrant Dictator	
INTERNAL_BELIEF	0.884 (0.538)	0.406 (0.592)	0.328 (0.903)	0.587 (0.848)
Constant	1.422*** (0.397)	5.944*** (2.095)	1.526* (0.668)	0.048 (3.512)
Control Variables	No	Yes	No	Yes
Observations	227	227	297	297
Prob > Chi <sup>2</sup>	0.100	0.046	0.716	0.088

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: INGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A12**

Tobit regression with out- group transfers by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. INTERNAL\_BELIEF is a dummy variable that takes the value of 1 if participants believe in bad luck of the allocated receivers and 0 if they believe in a lack of performance. Control variables are self-reported age, education, parent’s education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator		Immigrant Dictator	
INTERNAL_BELIEF	0.467 (0.567)	0.064 (0.526)	-0.357 (0.542)	-0.208 (0.550)
Constant	1.700*** (0.412)	2.361 (2.176)	0.953** (0.346)	-0.663 (1.781)
Control Variables	No	Yes	No	Yes
Observations	212	212	289	289
Prob > Chi <sup>2</sup>	0.411	0.013	0.510	0.534

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: OUTGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A13**

Logistic regression with native Germans, immigrants, and both groups jointly and with the dummy INTERNAL\_BELIEF as the dependent variable. INTERNAL\_BELIEF is a dummy variable that takes the value of 1 if participants believe in bad luck of the allocated receivers and 0 if they believe in a lack of performance. OUTGROUP is a binary dummy which equals 1 for transfers to out-group members and 0 for transfers to in-group members. Control variables are self-reported age, education, parent’s education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator Model (I)	Immigrant Dictator Model (II)	Joint Model (III)
OUTGROUP	0.368 (0.210)	-0.895*** (0.236)	0.129 (0.170)
Constant	0.550 (0.854)	1.790* (0.881)	0.926 (0.671)
Control Variables	Yes	Yes	Yes
Observations	439	586	1025
Prob > Chi <sup>2</sup>	0.000	0.017	0.000

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: INTERNAL\_BELIEF. Standard errors in parentheses.

**Table A14**

Tobit regression on the effects of attitudes toward social mobility instruments with in-group transfers under equal and under unequal opportunities by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. The perceived importance of the six instruments was elicited with 7-point Likert-scales, whereby higher values indicate a higher perceived importance of the instrument for success in life. WEALTHY\_FAMILY, EDUCATED\_PARENTS, EDUCATED, AMBITIOUS, HARD\_WORK, RIGHT\_PEOPLE indicate the perceived importance of being born in a wealthy family, having educated parents, being educated, being ambitious, being hard-working and knowing the right people for success in life. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator		Immigrant Dictator	
	Equal Op	Unequal Op	Equal Op	Unequal Op
WEALTHY_FAMILY	0.031 (0.149)	0.261 (0.170)	0.109 (0.174)	-0.503 (0.279)
EDUCATED_PARENTS	-0.169 (0.191)	0.212 (0.218)	0.304 (0.275)	0.126 (0.309)
EDUCATED	-0.371 (0.368)	-0.357 (0.331)	-0.281 (0.453)	-0.451 (0.478)
AMBITIOUS	0.120 (0.249)	0.365 (0.282)	1.074*** (0.276)	-0.095 (0.305)
HARD_WORK	-0.022 (0.231)	0.274 (0.213)	-0.699*** (0.215)	-0.100 (0.323)
RIGHT_PEOPLE	-0.210 (0.220)	-0.442 (0.234)	0.287 (0.278)	0.115 (0.324)
Constant	6.623** (2.463)	5.536* (2.546)	-3.131 (4.238)	4.396 (4.398)
Control Variables	Yes	Yes	Yes	Yes
Observations	168	227	197	297
Prob > Chi <sup>2</sup>	0.379	0.024	0.000	0.101

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: INGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A15**

Tobit regression on the effects of social ties with out-group transfers under equal and under unequal opportunities by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. Self-reported frequency of social contacts with immigrants by native Germans in the private, professional and public domain are indicated by TIES\_IMM\_PRIV, TIES\_IMM\_PROF, TIES\_IMM\_PUB. Self-reported frequency of social contacts with native Germans by immigrants in the private, professional and public domain are indicated by TIES\_NAT\_PRIV, TIES\_NAT\_PROF, TIES\_NAT\_PUB. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator		Immigrant Dictator	
	Equal Op	Unequal Op	Equal Op	Unequal Op
TIES_IMM_PRIV	0.471 (0.279)	0.211 (0.311)		
TIES_IMM_PROF	-0.282 (0.302)	0.276 (0.265)		
TIES_IMM_PUB	0.482 (0.334)	-0.802** (0.286)		
TIES_NAT_PRIV			-0.182 (0.267)	-0.182 (0.267)
TIES_NAT_PROF			0.337 (0.211)	0.337 (0.211)
TIES_NAT_PUB			0.212 (0.368)	0.212 (0.368)
Constant	2.902 (2.260)	3.421 (2.240)	-1.341 (1.814)	-1.341 (1.814)
Control Variables	Yes	Yes	Yes	Yes
Observations	150	212	289	289
Prob > Chi <sup>2</sup>	0.022	0.002	0.294	0.294

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: OUTGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A16**

Tobit regression on the effects of stereotypes along the dimensions competence and warmth with out-group transfers under equal and under unequal opportunities by native Germans and immigrants as the dependent variables. Possible transfers range from € 0 to € 12. Perceptions of native Germans are denoted by COMPETENCE\_NAT, CONFIDENCE\_NAT, WARMTH\_NAT, HONESTY\_NAT, SUCCESS\_NAT and EDUCATION\_NAT for perceived competence confidence, warmth, honesty, success and education of natives on 7-point Likert scales. Perceptions of immigrants are denoted by COMPETENCE\_IMM, CONFIDENCE\_IMM, WARMTH\_IMM, HONESTY\_IMM, SUCCESS\_IMM EDUCATION\_IMM for perceived competence confidence, warmth, honesty, success and education of immigrants on 7-point Likert scales. Control variables are self-reported age, education, parents' education, gender, income, inhabitants of the town of residency, political preferences, and the number of solved sliders in the real-effort task.

	Native Dictator		Immigrant Dictator	
	Equal Op	Unequal Op	Equal Op	Unequal Op
COMPETENCE_IMM	0.173 (0.378)	0.017 (0.454)		
CONFIDENCE_IMM	-0.078 (0.265)	-0.525* (0.247)		
WARMTH_IMM	-0.344 (0.434)	0.519 (0.325)		
HONESTY_IMM	0.005 (0.517)	0.058 (0.292)		
SUCCESS_IMM	-0.115 (0.265)	0.348 (0.255)		
EDUCATION_IMM	0.412 (0.338)	-0.449 (0.258)		
COMPETENCE_NAT			-0.143 (0.401)	0.212 (0.353)
CONFIDENCE_NAT			0.032 (0.294)	-0.379 (0.202)
WARMTH_NAT			-0.470 (0.274)	-0.578* (0.236)
HONESTY_NAT			-0.034 (0.290)	0.555 (0.320)
SUCCESS_NAT			0.530* (0.226)	0.363 (0.243)
EDUCATION_NAT			-0.420 (0.273)	-0.060 (0.218)
Constant	3.021 (3.037)	2.960 (2.524)	1.462 (2.403)	-2.172 (2.077)
Control Variables	Yes	Yes	Yes	Yes
Observations	150	212	194	289
Prob > Chi²	0.067	0.008	0.073	0.003

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ . Dependent variable: OUTGROUP\_TRANSFERS. Standard errors in parentheses.

**Table A17**

Spearman correlation matrix with control variables. AGE represents the participants age in years. The variable POL\_LEFT\_RIGHT represents a 7-point Likert scale on political preferences from left to right. MALE represents a dummy variable for gender taking a value of 1 for male participants and 0 for female participants. INCOME indicates the self-reported income of participants on a 5-point scale. INHABITANTS indicates the number of inhabitants of the participants' town of residence. EDUCATION and EDUCATION\_PARENTS represent the education level of the participant and her parents, respectively. PERFORMANCE indicates the number of correctly positioned sliders in the real-effort task.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MALE	1							
AGE	0.191***	1						
INCOME	0.174***	0.407***	1					
EDUCATION	0.024	-0.029	0.216***	1				
EDUCATION_PARENTS	0.082***	-0.054*	0.105***	0.378***	1			
INHABITANTS	-0.001	-0.112***	-0.020	0.141***	0.144***	1		
POL_LEFT_RIGHT	0.083***	0.129***	0.113***	-0.019	-0.019	-0.086***	1	
PERFORMANCE	0.099***	-0.176***	0.033	0.107***	0.107***	0.079***	-0.003	1

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.005$ .

## Supplementary material

Supplementary material associated with this article can be found, in the online version, at [10.1016/j.socec.2022.101911](https://doi.org/10.1016/j.socec.2022.101911)

## References

- Abbinck, K., & Harris, D. (2019). In-group favoritism and out-group discrimination in naturally occurring groups. *PLoS One*, *14*(9). <https://doi.org/10.1371/journal.pone.0221616>
- Aiyar, S. S., & Ebeke, C. (2019). Inequality of opportunity, inequality of income and economic growth. *IMF Working Paper*, *19/34*.
- Akbaş, M., Arieli, D., & Yuksel, S. (2019). When is inequality fair? an experiment on the effect of procedural justice and agency. *Journal of Economic Behavior & Organization*, *161*, 114–127.
- Alan, S., & Ertac, S. (2017). Belief in hard work and altruism: Evidence from a randomized field experiment. *Working Papers, Human Capital and Economic Opportunity Working Group*, *2017-053*.
- Alesina, A., & Angeletos, G.-M. (2005). Fairness and redistribution. *American Economic Review*, *95*(4), 960–980.
- Alesina, A., Giuliano, P., Bisin, A., & Benhabib, J. (2011). Preferences for redistribution. *Handbook of Social Economics. North Holland*, *1*, 93–131.
- Alesina, A., & La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities. *Journal of Public Economics*, *89*(5–6), 897–931.
- Alesina, A., Miano, A., & Stantcheva, S. (2022). Immigration and Redistribution. *The Review of Economic Studies*. <https://doi.org/10.1093/restud/rdac011>
- Alesina, A., Murard, E., & Rapoport, H. (2020). Immigration and preferences for redistribution in europe. *Working Paper*. [https://scholar.harvard.edu/files/alesina/files/alesina\\_murard\\_rapoport\\_feb2020.pdf](https://scholar.harvard.edu/files/alesina/files/alesina_murard_rapoport_feb2020.pdf)
- Alesina, A., Stantcheva, S., & Edoardo, T. (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review*, *108*(2), 521–554.
- Anderson, J., Burks, S. V., Carpenter, J., Götte, L., Maurer, K., Nosenzo, D., ... Rustichini, A. (2013). Self-selection and variations in the laboratory measure of other-regarding preferences across subject pools: evidence from one college student and two adult samples. *Experimental Economics*, *16*, 170–189.
- Anduiza, E., & Galais, C. (2017). Answering without reading: IMCs and strong satisficing in online surveys. *International Journal of Public Opinion Research*, *29*(3), 497–519.
- Barr, A., Lane, T., & Nosenzo, D. (2018). On the social inappropriateness of discrimination. *Journal of Public Economics*, *164*, 153–164.
- Bartling, B., Cappelen, A. W., Ekström, M., Sørensen Erik, O., & Tungodden, B. (2018). Fairness in winner-take-all markets. *CEPR Working Paper*, (7045).
- Bellemare, C., & Kröger, S. (2007). On representative social capital. *European Economic Review*, *51*, 183–202.
- Berg, A., Ostry, J. D., Tsangarides, C. G., & Yakhshilov, Y. (2018). Redistribution, inequality, and growth: New evidence. *Journal of Economic Growth*, *23*(3), 259–305.
- Bernhard, H., Fehr, E., & Fischbacher, U. (2006). Group affiliation and altruistic norm enforcement. *The American Economic Review*, *96*(2), 217–221.
- Blanco, M., Engelmann, D., & Normann, H. T. N. (2011). A within-subject analysis of other-regarding preferences. *Games and Economic Behavior*, *182*(104076), 321–338.
- Bolton, G., & Ockenfels, A. (2000). ERC: A theory of equity, reciprocity, and competition. *The American Economic Review*, *90*, 166–193.
- Brunori, P. (2017). The perception of inequality of opportunity in europe. *Review of Income and Wealth*, *63*(3), 464–491.
- Brunori, P., Ferreira, F. H. G., & Peragine, V. (2013). Inequality of opportunity, income inequality, and economic mobility: Some international comparisons. In: *Paus E. (eds) Getting Development Right. Palgrave Macmillan, New York*, 85–115.
- Bundesbank, D. (2016). Household wealth and finances in germany: Results of the 2014 survey. *Monthly Report*, *57*.
- Bundesbank, D. (2019). Household wealth and finances in germany: Results of the 2017 survey. *Monthly Report*, *13*.
- Burson, E., & Godfrey, E. B. (2020). Intra-minority solidarity: The role of critical consciousness. *European Journal of Social Psychology*, *00*, 1–16.
- Caballero, G. A. (2014). Information effect regarding inequality of opportunities on redistribution: A lab experiment. *Working Papers from Department of Economics, University of Calgary*, 2014-75.
- Cappelen, A. W., Halvorsen, T., Sørensen, E. O., & Tungodden, B. (2017). Face-saving or fair-minded: What motivates moral behavior? *Journal of the European Economic Association*, *15*(3).
- Cappelen, A. W., Konow, J., Sørensen, E. O., & Tungodden, B. (2013). Just luck: An experimental study of risk-taking and fairness. *American Economic Review*, *103*(4), 1398–1413.
- Cettolin, E., & Suetens, S. (2019). Return on trust is lower for immigrants. *The Economic Journal*, *129*(621), 1992–2009.
- Charness, G., Gneezy, U., & Henderson, A. (2018). Experimental methods: Measuring effort in economics experiments. *Journal of Economic Behavior and Organization*, *149*, 74–87.
- Charness, G., Rigotti, L., & Rustichini, A. (2007). Individual behavior and group membership. *American Economic Review*, *97*, 1340–1352.
- Checchi, D., Peragine, V., & Serlenga, L. (2010). Fair and unfair income inequalities in europe. *IZA Discussion Paper*, (5025).
- Chen, Y., & Li, S. X. (2009). Group identity and social preferences. *American Economic Review*, *99*, 431–457.
- Cherry, T. I., Frykblom, P., & Shogren, J. F. (2002). Hardnose the dictator. *American Economic Review*, *92*(4), 1218–1221.
- Corak, M. (2013). Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic Perspectives*, *27*(3), 79–102.
- Corak, M. (2016). Inequality from generation to generation: The united states in comparison. *IZA Discussion Paper*, (9929).
- Cortland, C. I., Craig, M. A., Shapiro, J. R., Richeson, J. A., Nee, R., & Goldstein, N. J. (2017). Solidarity through shared disadvantage: Highlighting shared experiences of discrimination improves relations between stigmatized groups. *Journal of Personality and Social Psychology*, *113*(4), 547–567.
- Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2007). The BIAS map: Behaviors from intergroup affect and stereotypes. *Journal of Personality and Social Psychology*, *92*(4), 631–648.
- Davis, L., & Deole, S. S. (2018). Immigration and the rise of far-right parties in europe. *ifo DICE Report*, *15*(4), 10–15.
- Dawes, C. T., Johannesson, M., Lindqvist, E., Loewen, P., Östling, R., Bonde, M., & Priks, F. (2012). Generosity and political preferences. *IFN Working Paper*, (941). <http://www.ifn.se/wfiles/wp/wp941.pdf>
- De Vries, C. E., Hakhverdian, A., & Lancee, B. (2013). The dynamics of voters left/right identification: The role of economic and cultural attitudes. *Political Science Research and Methods*, *1*(2), 223–238.
- Dufwenberg, M., & Kirchsteiger, G. (2004). A theory of sequential reciprocity. *Games and Economic Behavior*, *47*(2), 268–298.
- Duncan, G. J., & Murnane, R. J. (2011). *Introduction: The American Dream, then and now. In Whither Opportunity?*, ed. Greg Duncan and Richard Murnane - New York: Russel Sage.
- Durante, R., Putterman, L., & van der Weele, J. (2014). Preferences for redistribution and perception of fairness: An experimental study. *Journal of the European Economic Association*, *12*(4), 1059–1086.
- Dworkin, R. (1981a). What is equality? part 1: Equality of welfare. *Philosophy & Public Affairs*, *10*(3), 283–345.
- Dworkin, R. (1981b). What is equality? part 2: Equality of resources. *Philosophy & Public Affairs*, *10*(4), 283–345.
- Eckes, T. (2002). Paternalistic and envious gender stereotypes: Testing predictions from the stereotype content model. *Sex Roles*, *47*(3–4), 99–114.
- Edo, A., Giesing, Y., Öztunc, J., & Poutvaara, P. (2019). Immigration and electoral support for the far-left and the far-right. *European Economic Review*, *115*, 99–143.
- Engel, C. (2011). Dictator games: A meta study. *Experimental Economics*, *14*, 583610.
- Engelhardt, C., & Wagener, A. (2018). What do germans think and know about income inequality? A survey experiment. *Socio-Economic Review*, *16*(4), 743–767.
- Esping-Andersen, G. (1990). The three political economies of the welfare state. *International Journal of Sociology*, *20*(3), 92–123.
- Eurobarometer. (2018). *Integration of immigrants in the European Union. Special Eurobarometer 469*. <http://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/82537>
- Fehr, D., Müller, D., & Preuss, M. (2020). Perceptions of equality of opportunity and inequality acceptance. *Working Papers in Economics and Statistics*, 2020-02.
- Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics*, *114*(3), 817–868.
- Ferreira, F. H. G., & Peragine, V. (2015). Equality of opportunity: Theory and evidence. *Policy Research Working Paper World Bank Group, Washington, DC*, (7217). <https://openknowledge.worldbank.org/handle/10986/21656>
- Figini, P. (1999). Inequality and growth revisited. *Trinity Economic Paper Series*, *99*(2), 1019–1032.
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, *82*(6), 878902.
- Fleurbaey, M., & Peragine, V. (2013). Ex ante versus ex post equality of opportunity. *Economica*, *80*, 118–130.
- Fong, C. (2001). Social preferences, self-interest, and the demand for redistribution. *Journal of Public Economics*, *82*, 225–246.
- Frick, J. R., & Grabka, M. M. (2009). Wealth inequality on the rise in germany. *Weekly Report, ISSN 1860-3343, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin*, *5* (10), 62–73.
- Fuller, D. A., Alston, R. M., & Vaughan, M. B. (1995). The split between political parties on economic issues: A survey of republicans, democrats, and economists. *Eastern Economic Journal*, *21*(2), 227–238.
- Georg, S. J., Hennig-Schmidt, H., Walkowitz, G., & Winter, E. (2016). In wrong anticipation - miscalibrated beliefs between germans, israelis, and palestinians. *PLoS ONE*, *11*(6), e0156998.
- Gill, D., & Prowse, V. (2012). A structural analysis of disappointment aversion in a real effort competition. *The American Economic Review*, *102*(1), 469–503.
- Gimpelson, V. E., & Monusova, G. A. (2014). Perception of inequality and social mobility. *Higher School of Economics Research Paper, WP BRP(84/EC)*, 1–35.
- Glynn, C. J. (1997). Public opinion as a normative opinion process. *Annals of the International Communication Association*, *20*(1), 157–183.
- Grimm, S., & Klimm, F. (2019). Blaming the refugees? experimental evidence on responsibility attribution. *Journal of Economic Psychology*, *72*, 156–178.
- Grote, J. (2018). The changing influx of asylum seekers in 2014–2016: Responses in Germany. *Working Paper*, *79*.

- Guillen, P., & Ji, D. (2011). Trust, discrimination and acculturation: Experimental evidence on asian international and australian domestic university students. *The Journal of Socio-Economics*, 40(5), 594–608.
- Halla, M., Wagner, A. F., & Zweimüller, J. (2017). Immigration and voting for the far right. *Journal of the European Economic Association*, 15(6), 1341–1385.
- Heidhues, P., Koszegi, B., & Strack, P. (2019). Overconfidence and prejudice. *Papers, arXiv.org*.
- Heß, S. (2017). Randomization inference with stata: A guide and software. *The Stata Journal*, 17(3), 630–651.
- Hoffman, E., McCabe, K., & Smith, V. L. (1996). Social distance and other-regarding behavior in dictator games. *American Economic Review*, 86(3), 653–660.
- Holm, J., & Geys, B. (2018). Social identification and redistribution in heterogeneous federations: Evidence from germany and belgium. *Comparative Political Studies*, 51(9), 1177–1207.
- Jencks, C., & Tach, L. (2006). *Would Equal Opportunity Mean More Mobility?* In S. Morgan, D. Grusky, & Fields (Eds.), *Mobility and inequality: Frontiers of research in sociology and economics*. Palo Alto, CA: Stanford University Press.
- Kerschbamer, R., & Müller, D. (2020). Social preferences and political attitudes: An online experiment on a large heterogeneous sample. *Journal of Public Economics*, 182(104076).
- Klor, E. F., & Shayo, M. (2010). Social identity and preferences over redistribution. *Journal of Public Economics*, 94(3-4), 269–278.
- Koh, J. B. K., Shao, Y., & Wang, Q. (2009). Father, mother and me: Parental value orientations and child self-identity in asian american immigrants. *Sex Roles*, 60, 600–610.
- Krawczyk, M. (2010). A glimpse through the veil of ignorance: Equality of opportunity and support for redistribution. *Journal of Public Economics*, 94, 131–141.
- Kury, H., & Slawomir, R. (2018). *Refugees and Migrants in Law and Policy*. Springer Verlag.
- Lane, T. (2016). Discrimination in the laboratory: A meta-analysis of economics experiments. *European Economic Review*, 90, 375–402.
- Lezzi, E., Fleming, P., & Zizzo, D. J. (2015). Does it matter which effort task you use? a comparison of four effort tasks when agents compete for a prize. *Working Paper series, University of East Anglia, Centre for Behavioural and Experimental Social Science (CBESS)*. 15-05, School of Economics, University of East Anglia, Norwich, UK
- Lindqvist, E., & Östling, R. (2013). Identity and redistribution. *Public Choice*, 155, 469–491.
- Luttmer, E. F. P. (2001). Group loyalty and the taste for redistribution. *Journal of Political Economy*, 109(3).
- Magni, G. (2020). Economic inequality, immigrants and selective solidarity: From perceived lack of opportunity to in-group favoritism. *British Journal of Political Science*, 1–24.
- Markaki, Y., & Longhi, S. (2013). The statistical theory of racism and sexism. *Migration Studies*, 1(3), 311–337.
- Mollerstrom, J., Reme, B.-A., & Sørensen, E. O. (2015). Luck, choice and responsibility: An experimental study of fairness views. *Journal of Public Economics*, 131, 33–40.
- OECD. (2018a). A broken social elevator? how to promote social mobility. *OECD Publishing, Paris*. <https://doi.org/10.1787/9789264301085-en>
- OECD. (2018b). Inequalities in household wealth across OECD countries: Evidence from the OECD wealth distribution database. *Working Paper*, 88.
- Olivera, J. (2015). Preferences for redistribution in europe. *IZA Journal of European Labor Studies*, 4(14).
- Otto, A. H., & Steinhart, M. F. (2014). Immigration and election outcomes evidence from city districts in hamburg. *Regional Science and Urban Economics*, 45, 67–79.
- Patridge, M. D. (1997). Is inequality harmful for growth? comment. *The American Economic Review*, 87(5), 1019–1032.
- Perotti, R. (1996). Growth, income distribution, and democracy: What the data say. *Journal of Economic Growth*, 1(2), 149–187.
- Piketty, T. (1995). Social mobility and redistributive politics. *The Quarterly Journal of Economics*, 110(3), 551–584.
- Pornpattananangkul, N., Chowdhury, A., Feng, L., & Yu, R. (2019). Social discounting in the elderly: Senior citizens are good samaritans to strangers. *The Journal of Gerontology. Series B, Psychological science and social sciences*, 74(1), 52–58.
- Pratto, F., Sidanius, J., & Levin, S. (2006). Social dominance theory and the dynamics of intergroup relations: Taking stock and looking forward. *Review of Social Psychology*, 17, 271–320.
- Rey-Biel, P., Sheremeta, R. M., & Uler, N. (2018). When income depends on performance and luck: The effects of culture and information on giving. *Research in Experimental Economics, Emerald Publishing Limited*, 20, 167–203.
- Roemer, J. E. (1998). *Equality of opportunity*. Cambridge, MA: Harvard University Press.
- Roemer, J. E. (2002). Equality of opportunity: A progress report. *Social Choice and Welfare*, 19, 455–471.
- Saez, E., & Piketty, T. (2014). Inequality in the long run. *Science*, 344(6186), 338–343.
- Saez, E., & Zucman, G. (2016). Wealth inequality in the united states since 1913: Evidence from capitalized income tax data. *The Quarterly Journal of Economics*, 131(2), 519–578.
- Schaller, M. (1991). Social categorization and the formation of group stereotypes: Further evidence for biased information processing in the perception of groupbehavior correlations. *European Journal of Social Psychology*, 21(1), 25–35.
- Scheidel, W. (2017). *The great leveler: Violence and the history of inequality from the stone age to the twenty-first century*. New Jersey 08540: Princeton University Press.
- Schnepf, S. V. (2007). Immigrants' educational disadvantage: an examination across ten countries and three surveys. *Journal of Population Economics*, 20(3), 527–545.
- Schurter, K., & Wilson, B. J. (2009). Justice and fairness in the dictator game. *Southern Economic Journal*, 76(1), 130–145.
- Shayo, M. (2009). A model of social identity with an application to political economy: Nation, class, and redistribution. *American Political Science Review*, 103(2), 147–174.
- Sniderman, P. M., Hagedoorn, L., & Prior, M. (2004). Predisposing factors and situational triggers: Exclusionary reactions to immigrant minorities. *American Political Science Review*, 98(1), 35–49.
- Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica*, 47(2), 143–148.
- Trautmann, S. T. (2009). A tractable model of process fairness under risk. *Journal of Economic Psychology*, 30, 803–813.
- Verkuyten, M. (2008). Life satisfaction among ethnic minorities: The role of discrimination and group identification. *Social Indicators Research*, 89, 391–404.
- Verkuyten, M., & Zaremba, K. (2005). Interethnic relations in a changing political context. *Social Psychology Quarterly*, 68(4), 375–386.
- Vollhardt, J. R., Nair, R., & Tropp, L. R. (2016). Inclusive victim consciousness predicts minority group members support for refugees and immigrants. *Journal of Applied Social Psychology*, 46(6), 354–368.
- Willinger, M., Keser, C., Lohmann, C., & Usunier, J.-C. (2003). A comparison of trust and reciprocity between france and germany: Experimental investigation based on the investment game. *Journal of Economic Psychology*, 24(4), 447–466.
- Woessmann, L. (2004). How equal are educational opportunities? family background and student achievement in europe and the united states. *IZA Discussion Paper*, (1284).