Costs, needs, and integration efforts shape helping behavior toward refugees

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Recent political instabilities and conflicts around the world have drastically increased the number of people seeking refuge. The challenges associated with the large number of arriving refugees have revealed a deep divide among the citizens of host countries: one group welcomes refugees, whereas another rejects them. Our research aim is to identify factors that help us understand host citizens’ (un)willingness to help refugees. We devise an economic game that captures the basic structural properties of the refugee situation. We use it to investigate both economic and psychological determinants of citizens’ prosocial behavior toward refugees. In three controlled laboratory studies, we find that helping refugees becomes less likely when it is individually costly to the citizens. At the same time, helping becomes more likely with the refugees’ neediness: helping increases when it prevents a loss rather than generates a gain for the refugees. Moreover, particularly citizens with higher degrees of prosocial orientation are willing to provide help at a personal cost. When refugees have to exert a minimum level of effort to be eligible for support by the citizens, these mandatory “integration efforts” further increase prosocial citizens’ willingness to help. Our results underscore that economic factors play a key role in shaping individual refugee helping behavior but also show that psychological factors modulate how individuals respond to them. Moreover, our economic game is a useful complement to correlational survey measures and can be used for pretesting policy measures aimed at promoting prosocial behavior toward refugees.

Significance

The recent flow of refugees around the world evokes diametrically opposed reactions by the host countries’ citizens. Many people are willing to help refugees, whereas many others are not. Yet, the underlying mechanisms that lead to refugee helping versus rejection are not well understood. We use an economic game to investigate how economic and psychological factors shape citizens’ helping behavior toward refugees. We find that costs associated with refugee helping are a key determinant of citizens’ willingness to do so. It is especially people with a higher degree of prosociality that are willing to bear the personal cost of helping. Emphasizing the neediness of refugees as well as their integration efforts increases the willingness among citizens to provide help.

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similarities and differences regarding their views and motivations in specific social settings (e.g., Europeans’ support of refugees based on characteristics such as refugees’ education, political orientation, or country of origin; ref. 14). However, attitude measures only allow for detecting correlations and are limited in predicting actual prosocial behavior (17, 18). For example, one important shortcoming is that survey responses are hypothetical and have no actual consequences.

Here, we utilize an economic game that models helping behavior toward refugees. The focus of the game is on the monetary consequences of helping refugees for both the citizens of the host country and the refugees. Naturally, we do not want to suggest that citizens and refugees construe their situation exclusively as an economic question. Instead, we use monetary costs and benefits to model the basic interdependence structure of the refugee situation. This allows us to experimentally manipulate specific properties of the situation, both for citizens (e.g., the degree to which helping refugees is personally costly) and for refugees (e.g., their neediness). Thus, our game provides a valuable tool for understanding which economic and psychological factors are causally involved in shaping prosocial helping behavior toward refugees and for pretesting policy measures aimed at increasing refugee acceptance and helping.

Experimental Paradigm

The Refugee Game is played by two types of players: \( c = 5 \) citizens and a variable number \( r \) of refugees. Only citizens are active players, i.e., citizens’ behavior determines the payoff of both citizens and refugees.

In stage one, citizens, but not refugees, complete a real-effort task (19), in which each citizen \( i, i \in \{1, 2, 3, 4, 5\} \), earns a piece-rate loan \( w \). Thus, depending on their efforts \( e_i \), citizens earn a gross salary of \( p_i = w e_i \) in stage one. However, analogous to a general income tax, 40% of citizens’ gross salaries are withheld. The amount collected through this “tax,” \( G = \sum_{i=1}^{5} 0.4 p_i \), is available for redistribution among all players, i.e., citizens and refugees, in stage two. The remainders of their salaries, \( 0.6 p_i \), are directly transferred to citizens’ private accounts after the completion of stage one.

In stage two, citizens individually and privately make redistribution decisions concerning \( G \). To prevent strategic decision-making, one citizen’s redistribution decision is randomly chosen and implemented. Depending on the experimental condition (see below), we either model \( G \) as a private good or as a club good (20). In both conditions, citizens have the power to exclude the refugees from benefitting from the redistribution of \( G \) within the group of players, and refugees may at most receive as much of the collective good as citizens do. The difference between the conditions is whether sharing access to \( G \) with refugees reduces the share of \( G \) that citizens themselves obtain (private good) or not (club good), i.e., whether \( G \) is rivalrous or not, respectively. For instance, refugees may benefit from infrastructure, e.g., public transportation, that is provided through citizens’ tax payments. The additional costs for each citizen caused by refugees’ use of this infrastructure are negligible. In contrast, other helping measures, e.g., building new houses for refugees or granting them access to public health systems, may generate non-negligible additional costs to the citizens.

Redistribution decisions are elicited as follows: In the club good case, citizens each receive a fixed share of one-fifth of \( G \) and decide about the proportion \( s, 0 \leq s \leq 1 \), of one-fifth of \( G \) that each refugee shall receive. The resulting stage-two payoffs thus are as follows: \( G s / 5 \) per refugee and \( G / 5 \) per citizen. In the private good case, citizens decide about the proportion \( s, 0 \leq s \leq 1 \), of an equal share of \( G \) that each refugee shall receive. Thus, when citizens opt to share with the refugees in this scenario, their own shares fall below one-fifth. When \( s = 1 \), for example, this results in the minimum payoff for citizens and the maximum payoff for refugees, which is \( 1 / (5 + r) \) of \( G \) per person. The general stage-two payoffs are the following: \( sG/(5 + r) \) per refugee and \( (G − sG/(5 + r))/5 \) per citizen.

Despite being costly, each citizen’s share of \( G \) may at most reduce from one-fifth to one-sixth when \( r = 1 \), and from one-fifth to one-eighth when \( r = 3 \), meaning relative costs of 16.7% and 37.5%, respectively. When additionally considering citizens’ payoffs from their private accounts, the overall costs to citizens are rather low. This mirrors realistic conditions in which the individual cost of helping refugees is typically small because costs are shared among all citizens.

Results

We conducted three laboratory studies using the Refugee Game. In our studies, we investigated both economic (i.e., citizens’ costs of helping, refugees’ neediness, and the number of refugees seeking refuge) and psychological (i.e., citizen’s prosocial attitudes, their perception of the situation manipulated through framing, and refugees’ integration efforts) determinants of prosocial behavior toward refugees. In fact, in real-world refugee situations, host citizens vary substantially in their perceptions, i.e., in how they transform the objective situation into their psychological reality (21, 22). Our studies provide insights into whether people with different subjective representations of the actual situation will also differ in their willingness to help. The experimental manipulations put economic and psychological determinants under scrutiny that may contribute to the large heterogeneity in citizens’ reactions to refugees.

In study 1 (\( n = 114 \)), we used a 2 (costs of helping: cost-free vs. costly; within-subjects) × 2 (number of refugees: 1 vs. 3 refugees; between-subjects) mixed design. The first manipulation addresses citizens’ (perceived) costs of helping refugees. Recent evidence from survey research in Germany suggests that some individuals expect personal economic costs due to refugee intake, whereas others do not (23, 24). In reality, citizens’ perceived job security or their socioeconomic status might affect this perception. To account for this variety in subjective perceptions regarding personal costs associated with helping refugees and its potential impact on actual prosocial helping behavior, we manipulated the citizens’ objective costs of helping refugees. In the cost-free condition, participants faced the club good version of the Refugee Game (see above). Hence, helping refugees increased refugees’ payoffs but did not decrease citizens’ payoffs. In contrast, in the costly condition, citizens faced the private good version, where helping refugees reduced citizens’ personal payoffs.

The second manipulation addresses the substantial differences in refugee intake between countries (e.g., refugee intake in Lebanon amounts to about 21% of the host population, whereas it is less than 1% in Germany; ref. 25), which may further intensify in different regions within countries. Beyond these objective differences, the intensity of refugee intake can be perceived differently between individuals (mediated, e.g., by exposure to different media). To capture such differences, we varied the number of refugees in the Refugee Game, with \( r = 1 \) vs. \( r = 3 \) (at a constant level of \( c = 5 \) citizens across conditions). We also explored how individuals’ personality may contribute to different subjective representations of the actual refugee situation and, hence, helping behavior toward refugees. As a personality trait potentially associated with helping refugees, we assessed citizens’ general prosocial orientation (operationalized as individuals’ social value orientation, SVO; ref. 26), i.e., how they value their own welfare relative to the welfare of others. Accordingly, we can distinguish between people with a higher degree of prosociality (prosocials) and people with a lower degree of prosociality (proselfs). Although such preferences have been shown to predict prosocial behavior in a variety of social situations (27), research on attitudes and behaviors in the context of refugee helping and migration so far has not taken into
account the role of citizens’ differences in prosocial orientation (14–16).

As shown in Fig. 1A, the mean share s of G that citizens are willing to provide to each refugee, “helping” for short, was more than five times larger in the cost-free condition compared with the costly condition \( M_{\text{cost-free}} = 81.63, \text{SD} = 33.45; M_{\text{costly}} = 15.16, \text{SD} = 26.46; P < 0.001, \eta_p^2 = 0.75; \) model 1 in Table 1). The number of refugees did not affect citizens’ willingness to provide help \( M_{\text{1 refugee}} = 48.96, \text{SD} = 23.95; M_{\text{2 refugees}} = 47.81, \text{SD} = 20.84; P = 0.786, \eta_p^2 < 0.01; \) model 1). Moreover, citizens with a higher degree of prosocial orientation were more willing to provide costly help, indicated by a significant interaction between costs of helping and SVO \( (P = 0.004, \eta_p^2 = 0.07; \) model 2). As displayed in Fig. 1B, helping of citizens classified as prosocials vs. proselfs did not differ when helping was cost-free. However, when helping was costly, prosocials helped more than proselfs did. Helping was independent of citizens’ performance in the real-effort task (SI Appendix, Tables S1 and S2).

In study 2 \((n = 116)\), we focused on costly helping in the game version with \( r = 3 \) refugees to explore possibilities of increasing citizens’ willingness to help refugees. We applied a 2 (valence: positive vs. negative; within-subjects) \( \times \) 2 (framing: neutral vs. refugee; between-subjects) mixed design. Survey research indicates that the willingness to accept refugees increases with their neediness \((e.g., \) being a victim of torture; ref. 14). Therefore, we varied refugees’ neediness by manipulating the valence of refugees’ financial endowment. In the negative valence condition, refugees’ endowment was \( -20 \) points and therefore helping them would reduce a loss, whereas in the positive valence condition, refugees’ endowment was \( 0 \) points \((\text{as in study } 1)\) and helping them would provide them with a gain \( (\text{both relative to the status quo of providing no help}).\)

As a second factor, we varied the framing of the game. So far, it is not known whether the label “refugee” alone can evoke a higher willingness to help. Moreover, note that the basic structure of the Refugee Game is similar to other real-world collective helping situations, such as contributing to social security (e.g., supporting unemployed fellow citizens). Therefore, framing the game explicitly as a refugee situation may reveal context-aware helping situations, such as contributing to social security. The number of refugees did not affect citizens’ willingness to provide help \( (M_{\text{1 refugee}} = 48.96, \text{SD} = 23.95; M_{\text{2 refugees}} = 47.81, \text{SD} = 20.84; P = 0.786, \eta_p^2 < 0.01; \) model 1). Moreover, citizens with a higher degree of prosocial orientation were more willing to provide costly help, indicated by a significant interaction between costs of helping and SVO \((P = 0.004, \eta_p^2 = 0.07; \) model 2). As displayed in Fig. 1B, helping of citizens classified as prosocials vs. proselfs did not differ when helping was cost-free. However, when helping was costly, prosocials helped more than proselfs did. Helping was independent of citizens’ performance in the real-effort task (SI Appendix, Tables S1 and S2).

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As shown in Fig. 2A, we found a greater willingness to provide help in the negative valence condition compared with the positive valence condition \( (M_{\text{positive valence}} = 16.37, \text{SD} = 27.39; M_{\text{negative valence}} = 20.73, \text{SD} = 31.21; P = 0.002, \eta_p^2 = 0.08; \) model 1 in Table 2). Additionally, costly helping was more pronounced in the refugee framing condition compared with the neutral framing condition \( (M_{\text{neutral framing}} = 12.97, \text{SD} = 25.87; M_{\text{refugee framing}} = 24.14, \text{SD} = 29.87; P = 0.033, \eta_p = 0.04; \) model 1, Fig. 2B). Replicating the finding of study 1, we found a main effect of SVO, indicating that helping behavior increased with citizens’ degree of prosocial orientation \( (P = 0.001, \eta_p^2 = 0.09, \) model 2, Fig. 2B). Moreover, prosocials were more sensitive to the framing manipulation, i.e., they provided more help than proselfs in the refugee framing condition compared with the neutral framing condition, indicated by the significant interaction of SVO and framing \( (P = 0.016, \eta_p^2 = 0.05, \) model 2, Fig. 2B). Helping behavior was again independent of citizens’ performance in the real-effort task (SI Appendix, Tables S1 and S3).

In study 3 \((n = 123)\), we tested for behavioral and psychological effects of a policy intervention aimed at increasing citizens’ willingness to help refugees. In several countries, e.g., Austria, Germany, Norway, and Sweden, integration courses have been made mandatory for refugees to improve their language skills and basic qualifications for successful labor market integration (28). Moreover, from a psychological perspective, integration is often perceived as necessary—for example, because it facilitates positive contact between citizens and refugees (29). Therefore, we tested whether citizens’ mere knowledge of refugees’ integration efforts increases their willingness to provide help.

In the control condition, citizens engaged in a framed Refugee Game with extended instructions (Materials and Methods) and faced the same helping decision as in studies 1 and 2. The integration effort condition was identical, except that refugees also completed the real-effort task, in which they had to exert a certain effort level to be eligible for support by the citizens. In contrast to the citizens, however, refugees did not receive any pay for their effort and thus could not contribute to the collective account G. The monetary incentives for citizens are identical in both conditions: any long-term benefits and/or reciprocity potentially resulting from refugees’ successful integration are ruled out by design. In addition, we assessed participants’ prosocial orientation (26), political left-right orientation (30), and empathy (31) to explore their effects on helping behavior. We also measured behavioral motivations (21) after each helping decision (i.e., competition, egoism, fairness, and altruism) to see how motivations are affected by the different conditions and whether they account for different degrees of helping behavior.

We applied a one-factorial design on two subsequently played Refugee Games. In the first game, the integration policy was
randomly varied (between-subjects) to test for the isolated effect of refugees’ integration efforts. In the second game, participants learned about the second policy and made a decision in this setting as well. This was implemented to test the effectiveness of a policy change after participants had already made a helping decision under a specific policy.

In the first decision, citizens’ helping intent almost doubled when refugees had to complete the real effort task without pay ($M_{\text{integration effort}} = 40.82$, $SD = 40.89$; $M_{\text{control}} = 21.40$, $SD = 29.52$; $p = 0.003$, $\eta_p^2 = 0.07$, model 1 in Table 3). As shown in Fig. 3, this effect was moderated by citizens’ prosocial orientation ($P = 0.033$, $\eta_p^2 = 0.04$, model 2 in Table 3), i.e., citizens classified as prosocials increased their willingness to help when refugees showed effort ($M_{\text{prosocials, integration effort}} = 50.65$, $SD = 40.08$; $M_{\text{prosocials, control}} = 24.31$, $SD = 30.42$), whereas prosolls did not ($M_{\text{prosolos, integration effort}} = 15.94$, $SD = 32.10$; $M_{\text{prosolos, control}} = 16.67$, $SD = 27.97$). Independent of prosocial concerns, helping intent was greater when participants had a rather liberal/left political orientation ($P = 0.043$, $\eta_p^2 = 0.03$) or had greater levels of empathy ($P = 0.027$, $\eta_p^2 = 0.04$; see model 3 in Table 3). Citizens’ prior performance in the real-effort task had no significant effect ($SI$ Appendix, Tables S1 and S4).

Moreover, a multiple moderated mediation analysis suggests that prosocials’ increased helping intent in the integration effort condition is mediated by their reduced egoistic concerns (index of moderated mediation; ref. 32: 0.39, SE = 0.22, 95% CI = [0.060, 0.907], based on 5,000 bootstrap iterations). The other motivations, i.e., competition, fairness, and altruism, were not significant mediator variables.

Lastly, in the second decision, we also found that integration effort had a positive effect on citizens’ helping intent ($M_{\text{integration effort}} = 33.92$, $SD = 40.14$; $M_{\text{control}} = 21.86$, $SD = 30.41$; $P = 0.002$, $\eta_p^2 = 0.08$, $SI$ Appendix, Table S5). However, for the most part, helping behavior in the second decision was determined by helping in the first decision ($P < 0.001$, $\eta_p^2 = 0.90$), indicating a strong consistency/reference point effect. We found no other significant effects for second decisions.

**Discussion**

Migration is a pervasive societal challenge. Our results suggest that both economic and psychological factors need to be included to understand the divide in host populations’ reactions to incoming refugees. In three experimental studies, we show that individual costs strongly affect citizens’ helping behavior toward refugees. Trenchantly put: helping is not only a matter of values but also personal cost of helping was quite low compared with their overall earnings. Thus, our results indicate that the perception of even small individual costs may decrease citizens’ willingness to support refugees substantially.

Relatively, the results show that there is considerable interindividual heterogeneity in the reactions to the costs of helping. Individuals with a larger degree of prosocial orientation are more likely to provide costly help to refugees. Hence, helping refugees is—at least to a certain degree—motivated by a general prosocial concern toward others. This insight goes beyond previous survey research on individuals’ attitudes toward refugees. Moreover, it contributes to recent discussions about whether individuals’ prosocial orientation is universal or bounded by group membership (35). Our finding that prosocials helped more than prosolls did, especially when the game was framed as an intergroup interaction (i.e., when players were labeled as citizens and refugees), supports the perspective of a universal prosocial orientation—at least under some circumstances (i.e., when outgroup members are in strong need of help and when they exert effort toward integration).

Our findings also provide insights for policymakers on how to promote positive attitudes and behaviors toward refugees. First, acceptance of and support for refugees are likely to be higher when policymakers can credibly communicate that individual costs for citizens are negligible, or at least much smaller than many might anticipate. Second, we show that costly helping increases when refugees are more in need, i.e., helping that reduced a loss for refugees was more pronounced than helping that increased a gain. The external validity of this finding is supported by recent survey evidence that people’s attitudes toward asylum seekers are more positive when asylum-seekers are more vulnerable, e.g., when they have been victims of torture (14). Hence, policies aimed specifically at helping migrants in need of humanitarian aid may be more likely to be accepted by voters compared to policies that benefit migrants who are not as much perceived as needy. Lastly, the results suggest that mandatory integration courses for refugees may not only benefit refugees directly (e.g., by improving their chances for successful labor market integration) but also indirectly, by increasing citizens’ willingness to provide help. The communication of refugees’ integration efforts could increase refugee acceptance particularly among individuals with larger prosocial concerns.

We had to limit our focus to some specific variables presumably relevant to refugee helping behavior. The Refugee Game can be easily adapted to test further aspects and potential interventions regarding individuals’ willingness to support refugees. For instance, the game can be extended to investigate several groups of citizens (e.g., nations) that have to decide independently whether to help refugees or not. Citizens from different nations could be modeled as differing in their payoffs from the real-effort task to capture differences in wealth.

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**Table 2. Repeated-measures analyses of (co)variance predicting helping behavior in study 2 (n = 116)**

| Predictor            | Model 1 |          |          | Model 2 |          |          |
|----------------------|---------|----------|----------|---------|----------|----------|
|                      | $F$     | $p$      | $\eta_p^2$ | $F$     | $p$      | $\eta_p^2$ |
| Framing (A)          | 4.6     | 0.033    | 0.04     | 5.7     | 0.019    | 0.05     |
| Valence (B)          | 9.9     | 0.002    | 0.08     | 10.3    | 0.002    | 0.08     |
| A × B                | 2.8     | 0.097    | 0.02     | 2.9     | 0.094    | 0.03     |
| SVO (C)              | 11.0    | 0.001    | 0.09     | 11.0    | 0.001    | 0.09     |
| A × C                | 5.9     | 0.016    | 0.05     | 5.9     | 0.016    | 0.05     |
| B × C                | <1      | 0.800    | <0.01    | <1      | 0.800    | <0.01    |
| A × B × C            | 3.1     | 0.080    | 0.03     | 3.1     | 0.080    | 0.03     |

Framing, between-subjects factor; valence, within-subjects factor; SVO, continuous covariate (mean-centered).

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Table 3. Analyses of (co)variance predicting first-round helping behavior in study 3 (n = 123)

| Predictor                  | Model 1 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                            | F       | P     | η²    | F     | P     | η²    | F     | P     | η²    | F     | P     | η²    | F     | P     | η²    |
| Integration effort (A)     | 9.2     | 0.003 | 0.07  | 10.1  | 0.002 | 0.08  | 7.9   | 0.006 | 0.06  |       |       |       |       |       |       |
| SVO (B)                    | 9.6     | 0.002 | 0.08  | 3.3   | 0.073 | 0.03  |       |       |       |       |       |       |       |       |       |
| A × B                      | 4.7     | 0.033 | 0.04  | 6.1   | 0.015 | 0.05  |       |       |       |       |       |       |       |       |       |
| Political Orientation      | 4.2     | 0.043 | 0.03  |       |       |       |       |       |       |       |       |       |       |       |       |
| Empathy                    | 5.0     | 0.027 | 0.04  |       |       |       |       |       |       |       |       |       |       |       |       |

Integration effort, between-subjects factor; SVO, political orientation, and empathy, continuous covariates (all mean-centered).

Moreover, the Refugee Game can also be played repeatedly with refugees being allowed to contribute to the group’s collective account in later rounds. Refugees might also differ in their ability to contribute to the collective account, which could affect the willingness to help them (14). Finally, underscores the validity of the Refugee Game, study 3 also suggests that interindividual differences in political orientation and empathy predict refugee helping. Given that the study findings point to be first, future research could focus on identifying circumstances that increase citizens’ willingness to provide help to refugees, irrespective of, for instance, their political orientation.

Overall, the present research makes a first step toward a better understanding of the interplay of economic and psychological factors in predicting helping behavior toward refugees. Our method facilitates investigating the independent and joint effects of such factors under controlled laboratory conditions and provides a flexible “sandbox” for testing interventions aimed at promoting refugee support. Our experiments show that personal costs for helpers, but also the neediness and efforts of refugees matter. How they matter, however, depends on the degree to which a person is inclined to value others’ welfare. Thus, a nexus of economic and psychological factors explains helping behavior toward refugees.

Materials and Methods

Ethics Statement. The studies included human subjects and were conducted in accordance with the guidelines of the Helsinki Declaration and the German Psychological Association. All participants gave written informed consent to use and share their data for scientific purposes without disclosure of their identity. The studies were conducted at a German university, where institutional review boards or committees are not mandatory.

Study 1.

Participants. Participants in the role of citizens are statistically independent because they received no feedback about others’ performance or behavior before decision-making. An a priori power analysis advised n = 98 participants for sufficient test power (1 − β = 0.80, given α = 0.05) to detect a medium-sized effect (f = 0.25) in a repeated-measures analysis of variance with one additional between-subjects factor. To have a balanced number of participants across conditions and to be able to divide sessions into groups of five citizens, we recruited n = 120 participants (50 females; age: median (Mdn) = 23 y, range = [19, 55]) in six experimental sessions (i.e., three sessions per between-subjects factor). We excluded n = 6 participants who negatively deviated more than two SDs from the mean value of mistakes in the test questions (see below; first version: M = 1.53, SD = 2.23, second version: M = 1.08, SD = 0.51). Specifically, participants had to answer three test questions for both the cost-free condition and the costly condition. Since the within-subjects factor was counterbalanced, the first version may refer to either the costly condition or the cost-free condition, respectively. Results do not change qualitatively when including all participants in the analyses.

Procedures. Participants were invited via email to the experimental sessions. Upon arrival, they drew an index card that assigned them to a private computer cubicle. The whole experiment was computer-mediated with audio-video instructions (using headphones), implemented via the software z-Tree (36).

First, participants completed the SVO Slider Measure to assess their general prosocial orientation (ref. 26 and SI Appendix). In this task, participants could earn between 15 and 100 points, with a conversion rate of 100 points = 1 Euro. Next, participants learned about the second part of the experiment, in which they engaged in two independent versions of the Refugee Game. In case of a negative payoff, which was only possible in the negative endowment condition of study 2, the amount was subtracted from the accumulated payoff of the first part of the study. Each version represented one of the within-subjects conditions (cost-free vs. costly helping, counterbalanced order). Only after participants completed the first version of the Refugee Game, they learned about how the second one differed. Before they started, they completed a practice round of the real-effort task in stage 1 of the Refugee Games (Slider Task, ref. 19; for details, see SI Appendix). To assure that all participants understood the structure and consequences of their helping decisions (i.e., stage 2 of the Refugee Game), they had to correctly answer three test questions. The attempts to correctly answer the questions were tracked by the software, and the experimenter only helped participants to answer questions if they did not find the correct answers within a reasonable time. Afterward, participants made their helping decision by indicating how much they wanted to share with the refugees. At the end of the experiment, it was randomly determined which game version became payoff-relevant, with a conversation rate of 100 points = 10 Euro. Note that neutral terms were used to refer to the citizens (i.e., contributing players) and refugees (i.e., noncontributing players).

At the end, participants answered a postexperimental questionnaire (including demographics), which was followed by payoff information and private payment. Experimental sessions lasted for about 60 min. Participants earned on average 9.00 Euro. The instructions and test questions are available in SI Appendix. Note that because refugees had an inactive role in the game, they were not part of the actual experimental sessions. Participants from a different study received the payments as refugee players. In detail, in the first part, individuals participated in another, unrelated task, in which they accumulated positive payoffs due to some fixed show-up fee and an additional behavior-contingent payoff. In the second part, they were paid the payoff as a refugee player depending on the helping behavior of the citizens in the Refugee Game.

Study 2.

Participants. Because the experimental design was structurally identical to study 1, we built our sample size estimation on the same power analysis. Accordingly, we recruited n = 120 (46 females; age: Mdn = 24 y, range = [17, 58]) participants in six experimental sessions with 20 participants each. We excluded n = 4 participants who negatively deviated more than two SDs from the mean value of mistakes in the test questions (first version: M = 1.53, SD = 2.46, second version: M = 1.13, SD = 0.79). Specifically, participants had to answer four test questions for both the positive and negative valence condition. Since the within-subjects factor was counterbalanced, the first version may refer to either the positive or negative valence condition.
respectively. Results do not change qualitatively when including all participants in the analyses.

**Procedure.** The procedure of study 2 was identical to that of study 1. Participants earned on average 8.70 Euro for the 60-min study.

**Study 3.**

**Participants.** An a priori power analysis advised \( n = 128 \) participants for sufficient test power (\( 1 - \beta = 0.80 \), given \( \alpha = 0.05 \)) to detect a medium-sized effect (\( f = 0.25 \)) in an analysis of variance. We conducted seven experimental sessions with a total of \( n = 130 \) participants (55 females; age: \( \text{Mdn} = 23 \) years, range = [18, 32]). We excluded \( n = 7 \) participants who negatively deviated more than two SDs from the mean value of mistakes in the test questions (\( M = 1.06, \text{SD} = 0.13 \)). There were 11 test results. Results do not change qualitatively when including all participants in the analyses.

**Procedure.** The procedure of study 3 was largely identical to that of studies 1 and 2, except for the following changes. First, we used extended instructions to make sure that participants (i) did not erroneously believe that refugee players would be real refugees and (ii) did understand the payoff structure properly. This was tested using an extended battery of test questions. Second, we additionally assessed participants’ behavioral motivation after each decision (ref. 21; competition, egoism, fairness, and altruism), as well as interindividual differences in political orientation (30) and empathy (31) in a postexperimental questionnaire (for details on these measures, see SI Appendix, Table 56). The experiment took about 60 min. Participants earned on average 10.20 Euro.

**Data Access.** The data of all studies are publicly available at https://osf.io/7a94r/.

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1. Neumayer E (2005) Bogus refugees? The determinants of asylum migration to Western Europe. Int Stud Q 49:389–409.
2. Schooler J, Heering L, Esveldt I, Groenewold G, van der Erf R (2000) Push and pull factors of international migration: A comparative report. Available at https://www. popline.org/node/180911. Accessed October 6, 2017.
3. UNHCR (2016) Global Trends: Forced displacement in 2015. Available at www.unhcr.org/statistics/unhcrstats?576408c7dunhcr-global-trends-2015.html. Accessed June 1, 2017.
4. International Organization for Migration (2009) Migration, environment and climate factors of international migration: A comparative report. Available at www.popline.org/node/180911. Accessed May 11, 2017.
5. Refugees Welcome (2017) Refugees Welcome. Available at www.refugeesarewelcome.org/. Accessed May 11, 2017.
6. Anzahl der Gewalttaten mit extremistischem Hintergrund aus dem Bereich “politisch motivierte Ausländer/Innenvandalismus” von 2009 bis 2015 nach Art des Delikts [Number of acts of violence with an extremist background, particularly politically motivated violence against foreigners, between 2010 and 2016 by type of crime]. Available at https://de.statista.com/statistik/daten/studie/4732/umfrage/entwicklung-der-anzahl-von-extremistischer-politischer-auslaenderstraftaten/. Accessed May 11, 2017. German.
7. Refugees Welcome (2017) Refugees Welcome. Available at www.refugeesarewelcome.org/. Accessed May 18, 2017.
8. Fiske ST, Cuddy AJC, Glick P, Xu J (2002) A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. J Pers Soc Psychol 82:378–902.
9. Brown R, Zagarكافa H (2011) The dynamics of acculturation: An intergroup perspective. Adv Exp Soc Psychol 44:129–184.
10. Plomin R, Rohmann A, Flora AK (2002) Concordance of acculturation attitudes and perceived threat. Group Processes Intergroup Rel 5:221–232.
11. Kauff M, Wagner U (2012) Valuable therefore not threatening: The influence of di- mensional approach. J Pers Soc Psychol 44:113–126.
12. Bansak K, Hainmueller J, Hangartner D (2016) How economic, humanitarian, and religious concerns shape European attitudes toward asylum seekers. Science 354:217–222.
13. Ceobanu AM, Escandell X (2010) Comparative analyses of public attitudes toward immigrants and immigration using multinational survey data: A review of theories and research. Annu Rev Sociol 36:309–328.
14. Esse VM, Hamilton LK, Gaucher D (2017) The global refugee crisis: Empirical evidence and policy implications for improving public attitudes and facilitating refugee re-settlement. Soc Issues Policy Rev 11:78–123.
15. Peattie K (2010) Green consumption: Behavior and norms. Annu Rev Environ Resour 35:195–228.
16. Shepard P (2002) Intention—behavior relations: A conceptual and empirical review. Eur Rev Soc Psychol 12:1–36.
17. Gill D, Prose V (2012) A structural analysis of disappointment aversion in a real effort competition. Am Econ Rev 102:469–503.
18. Samuelson PA (1954) The pure theory of public expenditure. Rev Econ Stat 36:387–389.
19. Kelley HH, Thibaut JW (1978) Interpersonal Relations: A Theory of Interdependence (John Wiley & Sons, New York).
20. Rusburn CE, Van Lange PAM (2003) Interdependence, interaction, and relationships. Annu Rev Psychol 54:351–375.
21. Bertelsmann Stiftung (2017) Willkommenskultur im “Stressest”; Einstellungen in der Bevölkerung 2017 und Entwicklungen und Trends seit 2011/12 [Stress testing the culture of welcome: Citizens’ attitudes in 2017 and changes since 2012]. Available at https://www.bertelsmann-stiftung.de/fileadmin/files/2017/81_Einwohner@und_Vielfalt_II,Umfrage_Willkommenskultur_2017.pdf. Accessed May 19, 2017. German.
22. Wilke R, Stokes B, Simmons K (2016) Europeans fear wave of refugees will mean more terrorism, fewer jobs: Sharp ideological divides across EU on views about minorities, diversity and national identity. Available at www.pewresearch.org. Accessed Sep- tember 6, 2017.
23. UNHCR (2016) UNHCR - Mid-year trends, June 2015. Available at www.unhcr.org/statistics/ unhcrstats/s56701b669mid-year-trends-june-2015.html. Accessed June 1, 2017.
24. Murphy RO, Ackermann KA, Handgraaf MJU (2011) Measuring social value orienta- tion. Judgm Decis Making 6:771–781.
25. Pletzer JL, et al. (2018) Social value orientation, expectations, and cooperation in social dilemmas: A meta-analysis. Eur J Pers 32:62–83.
26. European Parliament (2018) Study in focus: Integration of refugees in Austria, Ger- many, Sweden. Available at www.europarl.europa.eu/RegData/etudes/ATAG/2018/ 614206/IPOL_ATA%282018%29614206_EN.pdf. Accessed March 12, 2018.
27. Dixon J, et al. (2010) A paradox of integration? Intercultural contact, prejudice reduction, and perceptions of racial discrimination. J Soc Issues 66:401–416.
28. Kroh M (2003) Measuring left-right political orientation: The choice of response format. Public Opin Q 71:204–220.
29. Davis MH (1983) Measuring individual differences in empathy: Evidence for a multi- dimensional approach. J Pers Soc Psychol 45:351–361.
30. Hayes AF (2015) An index and test of linear moderated mediation. SI Appendix, Table S6).
31. Davis MH (1983) Measuring individual differences in empathy: Evidence for a multi- dimensional approach. J Pers Soc Psychol 45:351–361.
32. Hayes AF (2015) An index and test of linear moderated mediation. Multivariate Behav Res 50:1–22.
33. Jenkins GDJ, Mitra A, Gupta N, Shaw JD (1998) Are financial incentives related to performance? A meta-analytic review of empirical research. J Appl Psychol 83:777–787.
34. Giles EL, Robalino S, McColl E, Sniehotta FF, Adams J (2014) The effectiveness of fi- nancial incentives for health behaviour change: Systematic review and meta-analysis. PLoS One 9:e90347.
35. Rusch H (2014) The evolutionary interplay of intergroup conflict and altruism in hu- mans: A review of parochial altruism theory and prospects for its extension. Proc Biol Sci 281:20141539.
36. Fischbacher U (2007) zTree: Zurich toolbox for ready-made economic experiments. Exp Econ 10:171–178.