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INGROUP LOVE DRIVES INGROUP BIAS WITHIN NATURAL GROUPS

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Abstract: Humans often favor their own group members over others, a preference that drives discrimination and intergroup conflicts. Whether such ingroup bias is a result of elevated concerns for one's group members or diminished concerns for outgroup members remains an open question. We test this experimentally with natural groups in Ethiopia that have varying intergroup relations (neutral vs. enmity) and strengths of group identity (weak vs. strong). We find that ingroup bias manifests as concern toward ingroup but not outgroup members and that a strong group identity amplifies ingroup concerns, whereas enmity has no effect. Our results thus identify shared group identity as a primary driver of concerns for others.

1. Introduction

Across many societies and settings, people tend to favor their ingroup members over others (Balliet, Wu, and de Dreu 2014; Romano et al. 2017; Böhm, Rusch, and Baron 2018). However, especially in uncompetitive settings without salient group identities, most people also show positive concern for the welfare of others (Henrich et al. 2005; Henrich et al. 2006; Engel 2011).

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Whether ingroup bias manifests as elevated concern for the welfare of one's own group or reduced concern for the outgroup, or both, still is an open question (Brewer 2002; Halevy, Bornstein, and Sagiv 2008; de Dreu et al. 2010; Halevy, Weisel, and Bornstein 2012; Buttelmann and Böhm 2014). In this paper, we tackle this question using evidence from a lab-in-the-field experiment with natural groups that have varying intergroup relations (neutral vs. enmity) and strengths of group identity (ethnic homogeneity vs. heterogeneity).

How ingroup bias manifests could be shaped by the nature of the relationship between groups: with neutral outgroups, we would expect some degree of concern for the wellbeing of others (Ahmed 2007; Bernhard, Fischbacher, and Fehr 2006; Charness, Rigotti, and Rustichini 2007; Chen and Li 2009; Goette, Huffman, and Meier 2006, 2012). With rivalry, however, such preferences could be attenuated (Brewer 2002; Böhm, Rusch, and Baron 2018; Weisel and Böhm 2015). Furthermore, facing a member of a rival group could increase ingroup favoritism by invoking one's own group identity, that is, by increasing its salience more strongly compared to facing a member of a neutral outgroup (Alt et al. 2018; Benjamin, Choi, and Strickland 2010; Chang, Chen, and Krupka 2019; Harris et al. 2015). Moreover, ingroup bias could *per se* be larger in groups with strong identities compared to groups with weak identities (Akerlof and Kranton 2000; Ben-Ner et al. 2009; Chowdhury, Jeon, and Ramalingam 2016; Goette et al. 2012; Goette, Huffman, and Meier 2012).

We experimentally test these possible constituents of ingroup bias in a region where group relations and identities play a crucial role in daily life. We recruited male participants belonging to one of three natural groups inhabiting the South Omo Valley in Ethiopia. Two of these groups, Daasanach and Nyangatom, are long-standing enemies with a long history of lethal raids between each other (Doğan, Glowacki, and Rusch 2018; Glowacki et al. 2016). Conflicts are usually motived by a desire to capture livestock or obtain revenge for earlier acts of violence. Both Nyangatom and Daasanach are ethnically homogeneous with strong group identities (Houtteman 2011; Yntiso 2016), and have been recognized by the Ethiopian government as ethnic groups with the right to self-governance at the local level. The third group, Highlanders, has neutral relations with the other two groups. Highlanders are ethnically heterogeneous and have only weak social ties between each other.

Behavior in neutral group pairings forms our benchmark and comes closest to the setups of existing studies on ingroup bias utilizing W.E.I.R.D. samples (Balliet, Wu, and de Dreu 2014; Henrich,

Heine, and Norenzayan 2010). By comparing behavior in neutral and enemy group pairings we can measure the directional and level-effects of intergroup relations on ingroup bias. The natural variation in the strength of group identities in our sample allows us to test whether ingroup bias increases with the strength of group identity.

We find that participants show a universal lack of concern for the outgroup welfare irrespective of intergroup relations. Ingroup concerns are not affected by enmity whereas a strong group identity is associated with a larger ingroup concern. In sum, ingroup bias manifests as positive welfare concerns for the ingroup for the majority of participants and it is stronger in groups with a strong group identity. Our study contributes to the literature on ingroup bias by investigating its determinants in natural groups where group membership is an important feature of one's identity. To the best of our knowledge, we are also the first to study groups with long-standing real-life conflict to show its effect on ingroup bias.

2. Experimental sample and design

This study was conducted in Nyangatom and Daasanach Woredas (governmental units) of southwest Ethiopia. Nyangatom and Daasanach are small ethnic groups, living primarily as nomadic pastoralists and inhabiting largely ethnically homogenous regions. They have a long history of violent conflicts with each other that primarily take the form of tit-for-tat raiding (Glowacki et al. 2016; Tornay 1979). Though they also have trading relationships occasionally, they recognize each other as enemies; in fact, the Nyangatom refer to Daasanach as "emoit", literally meaning 'enemy'. Ethiopian Highlanders reside in both Nyangatom and Daasanach areas and primarily engage in wage labor or work as shopkeepers and do not engage in intergroup conflict with either Daasanach or Nyangatom. They are usually recent immigrants to the area who have relocated from other areas of Ethiopia, and primarily identify as Wolayta, which is a significantly larger ethnic group numbering over two million (Population Census Commission, Addis Ababa 2008).

We recruited only adult male participants to best simulate real-world between-group decision making processes, where only adult men are involved in intergroup conflict. In total, 192 males participated in the experiment who belong to one of three natural groups; Daasanach (N=48), Nyangatom (N=96) and Highlanders (N=48). Nyangatom and Highlander participants were

recruited from the town of Kangaten while Daasanach participants were recruited from the town of Omorate. Participants from the same cultural group were assembled in groups of 12 in a private area and participated in the study individually. Verbal informed consent was obtained from all participants and the Committee on the use of Human Subjects at Harvard University approved this study. The experiment was conducted using verbal instructions with neutral framing; all possible choices and their payoff consequences were common knowledge. Participants remained anonymous and did not learn the decisions of anyone else throughout the experiment. A local research assistant who was familiar with the purposes and procedures of the study translated study instructions and participant responses on the spot. Participants were informed of the study procedures and told that they would be paid on the basis of one randomly chosen allocation decision they made. For each of the four choices they made, they were told the cultural identities (Nyangatom, Daasanach, or Highlander) of all other players involved. After completing all four choices which were presented in a counterbalanced order, participants were debriefed and asked not to talk about the experiment. Participants then received a show-up fee of 20 birr (approx. 1 USD) and payments were based on random selection of one condition and were made after the conclusion of data collection for all participants. Verbal instructions and payment procedures can be found in the Appendix.

We employed a simple group decision-making task, a variant of the multiple dictator game (Dana, Weber, and Kuang 2007). In our task, two players decide whether to expropriate the endowment of a passive third player, the 'victim' for short. In the experimental instructions, this choice was denoted as "taking" the tokens of the third player in a group of three. Initially, each player has 10 tokens. The victim's endowment is equally redistributed to the two decision-makers only if both choose to expropriate. Thus, with redistribution, decision-makers each earn 15 tokens and the victim earns zero. Conditional on group identities of all players, three motives play a role in players' decisions: a selfish motive, a concern for the welfare of one's ingroup members, and a (lack of) concern for the welfare of the outgroup members.

Using a within-subject manipulation, we varied the group memberships of the decision-makers and the victim. Each participant made four decisions, one for each of the following cases: Out-In, In-In, In-Out, and Out-Out. Herein, the first word denotes the co-decision-maker's group membership and the second denotes the victim's group membership, both relative to the participant. At the end of the experiment, one group constellation was randomly chosen for

payment (see Appendix for detailed procedures). Observing players' choices in these four group constellations enables us to classify participants according to their concern for the welfare of members of their ingroup and the outgroup. Using a between-subject manipulation, we varied the group relations (neutral vs. enmity). Participants were informed of the identity of the outgroup (Nyangatom, Highlander, Daasanach) prior to decision-making.

3. Model

We use a straightforward, linearly additive utility model to organize our hypotheses and results. Thus, individuals derive utility from their own payoff, x_i, based on a concave function f, $f_1>0$, $f_{11}<0$, and from the total payoff of their ingroup excluding themselves, X_I, and outgroup, X_O. Parameters μ_i and β_i depict the level of concern for the welfare of ingroup and outgroup players, respectively. Thus:

$$U_i = f(x_i) + \mu_i X_I + \beta_i X_O .$$

In the absence of competition or conflict, most individuals show a concern for others' welfare regardless of group membership (Cooper and Kagel 2016; Engel 2011; Falk et al. 2018). To account for such concerns, assume that individuals have a preference for the welfare of the outgroup, but at a lower level than their preference for the welfare of their own group, which is at a lower level than their preference for their own payoff, thus, $1>\mu_i>\beta_i$. We assume that participants exhibit ingroup love, that is, μ_i is non-negative. We also assume β_i to be non-negative in neutral group pairings based on the findings of previous research on ingroup bias using the minimal group paradigm (Chen and Li 2009; Otten 2016). Finally, we assume β_i and therefore μ_i are high enough for some *i* to prefer the equal outcome over expropriation; that is, in our setup, there exist μ_i such that $f(10) + 5\mu_i > f(15)$ holds. Assume μ_i is continuously distributed between 0 and 1 in the population, and β_i, if positive, is drawn from a continuous distribution between 0 and μ_i.

Then, in neutral group pairings the behavioral predictions are straightforward and as follows: Given the same co-decision-maker, taking money from an outgroup victim is weakly preferred over taking money from an ingroup victim. Likewise, given the same victim, an ingroup co-decision-maker is weakly preferred over an outgroup co-decision-maker. Notice that the higher the concerns for ingroup members in the group, the lower the expropriation rate of ingroup members.

Prediction 1: Assume β_i is positive for all *i*. Then, group constellations ordered according to predicted expropriation rates are: Out-In < In-In < Out-Out < In-Out.

A strong group identity could lead players to care less about the outgroup, i.e., β_i is drawn from a continuous distribution between 0 and $\mu_i' < \mu_i$. Moreover, outgroup hate, as possible in the case of enmity, would lead to a negative β (Brewer 2002; Buttelmann and Böhm 2014; Halevy, Bornstein, and Sagiv 2008; Halevy, Weisel, and Bornstein 2012). We would then expect groups with a stronger identity to expropriate more often in group constellations with an outgroup victim, and less in the group constellation with an ingroup victim and outgroup collaborator.

Prediction 2: Consider a group with a strong identity whose members have smaller β than the members of a group with a weaker group identity. Then, in the group with a stronger group identity expropriation rates are higher in Out-Out and In-Out, unchanged in In-In, and smaller in Out-In group constellation than in the group with a weaker group identity.

Consider now outgroup hate as a special case. With outgroup hate, β is negative. In that case, there is full expropriation of an outgroup victim, i.e., in Out-Out and In-Out. Further, in Out-In expropriation rates are smaller with smaller β_i because of the disutility from the benefit which the outgroup member receives from expropriation.

Enmity or a strong group identity could heighten ingroup concerns. A group could have a larger ingroup concern when facing an enemy than when facing a neutral outgroup (Benjamin, Choi, and Strickland 2010; Chen et al. 2014), i.e., $\mu_i' > \mu_i$. Likewise, members of a group with a strong group identity could have larger ingroup concerns than members of a group with a weak group identity. In such a case, the rate of expropriation of ingroup members will be lower, i.e., in In-In and Out-In, and expropriation in In-Out will be higher with positive β.

Prediction 3: Assume that facing an enemy increases ingroup concerns for all *i* such that $\mu_i' > \mu_i$. Then, expropriation rates in In-In and Out-In are lower, in Out-Out unchanged, and in In-Out larger with μ_i' compared to μ_i.

To sum up, compared to neutral outgroups, if enmity decreases concerns for the outgroup's welfare or leads to outgroup hate, then members of enemy outgroups would be targeted more often, with full expropriation in case of outgroup hate, i.e., in Out-Out and In-Out. Further, if being reminded

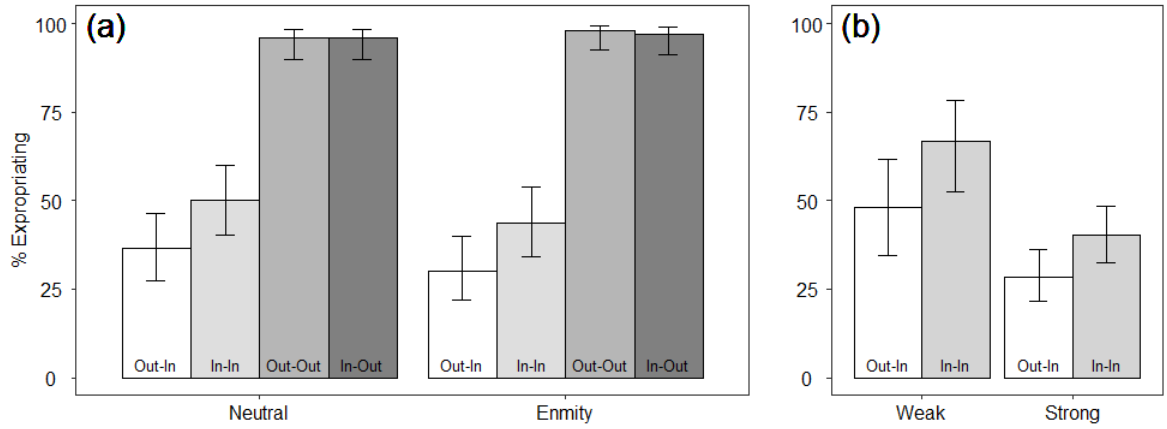
of the enemy makes one's own group identity more salient, thereby increasing concerns for ingroup welfare, ingroup members would be expropriated less often, i.e., in Out-In and In-In. The same pattern would also be obtained in groups with a strong group identity when compared to groups with a weak identity. Notice that expropriation in Out-In is akin to treason in real-life groups with enmity relations, where any such collaboration with the members of enemy groups would be prohibited and highly sanctioned in real-world contexts. Therefore, we would not expect any expropriation in Out-In in the enmity condition.

4. Results

Figure 1a shows the percentage of participants who expropriate per group constellation and per group relationship where group constellations with an ingroup victim are depicted on the left. Figure 1b shows the percentage of participants expropriating from an ingroup member per strength of group identity. Two results stand out: first, remarkably, almost everyone (96.6%) chose to expropriate when the victim is an outgroup member regardless of intergroup relations. Thus, participants do not care enough about the welfare of even the neutral outgroup members in order to establish the equitable outcome, i.e. our participants' β_i's are too low to compensate for foregone earnings from expropriation. Second, ingroup bias introduces positive welfare concerns for one's ingroup for a substantial proportion of participants. As opposed to virtually full exploitation of outgroup victims, only 40.1% of participants chose to expropriate ingroup victims. The difference is highly significant and robust to the type of intergroup relation and strength of group identity (all McNemar exact tests p's < 0.0002; odds ratios > 3.048). Further, participants were indeed reluctant to expropriate ingroup victims when this required coordinating with outgroup members, that is, in Out-In. Nonetheless, such 'treason' is still remarkably prevalent in the enmity condition.

Figure 1. Percentage of expropriators **(a)** per group relationship and group constellation; **(b)** per type of group identity and group constellation with ingroup victims. Daasanach and Nyangatom are enemies, and Highlanders have neutral relationships with both Daasanach and Nyangatom.

Highlanders have a weak group identity, and Daasanach and Nyangatom have strong group identities. Error bars indicate 95% Wilson's confidence intervals for single proportions.



Surprisingly, enmity plays no role in ingroup bias. If the victim is an ingroup member, expropriation rates in enmity are not significantly different from those in neutral (50.0% vs. 43.8% in In-In, 36.5% vs. 30.2% in Out-In in enmity vs. neutral conditions, respectively, and tests of proportions p's > 0.358). Since outgroup members are universally exploited, expropriation rates in enmity and neutral are virtually the same in Out-Out and In-Out.

Finally, a strong group identity increases concerns for one's ingroup members' welfare: the group with the weakest social identity among the three, Highlanders, had the highest rate of expropriation when targeting an ingroup member. Comparing Highlanders and the pooled data of Daasanach and Nyangatom, expropriation rates in the Out-In and In-In constellations are significantly higher for Highlanders (test of proportions p = 0.0133 and p = 0.0015, respectively). Further, about half of the Highlanders collaborate with an outgroup member to expropriate another Highlander, pointing to rather weak concerns for the welfare of their ingroup members.

Next, we classify our subjects into types based on their decisions in the four group constellations. Table 1 shows that 172 out of 192 participants (89.58%) can be classified as one of four types. Expropriating in all cases but Out-In is consistent with a positive but low level of ingroup concerns. Expropriating outgroup members but not ingroup members is consistent with high level of ingroup concerns. Overall, about 60% of our participants exhibit ingroup bias, with most of these showing high levels of concern for their ingroup members. More than a quarter of participants show no ingroup bias in our setup as they always chose the selfish option. Consistent with the aggregate

results, a strong group identity sharply increases ingroup bias: whereas the modal type is selfish in the group with a weak group identity, with a strong group identity, almost half of the participants exhibit a high level of concern for their fellow ingroup members. Thus, ingroup bias is larger in groups with a strong group identity and manifests as a higher level of positive concern for the welfare of one's ingroup members.

Table 1. Percentage of types in the population and per group identity. Number of observations in Overall are 51, 36, 83, 2, and 20, per type, respectively. The corresponding number of observations in Weak group identity are 21, 10, 13, 1, and 3, and in Strong group identity 30, 26, 70, 1, and 17, respectively.

Choice pattern	*Type*	*Overall*	*Weak*	*Strong*
Always expropriate	Selfish	26.56 %	43.75 %	20.83 %
Expropriate except Out-In	Low ingroup concerns	18.75 %	20.83 %	18.05 %
Expropriate outgroup	High ingroup concerns	43.23 %	27.08 %	48.61 %
Never expropriate	Fair	1.04 %	2.08 %	0.69 %
Other	Other	10.42 %	6.25 %	11.81 %

5. Conclusion

Overall, our results support theories that conceive of ingroup bias as a concern for the wellbeing of one's ingroup's members with *no or little* concern for the outgroup, even in neutral group pairings. The almost universal exploitation of outgroup members prevents us from testing whether enmity decreases concerns for the outgroup relative to neutral group relations. In our setup, ingroup bias is larger in groups with a strong group identity. However, the marginal effect of a strong group identity on ingroup bias is much smaller than that of an outgroup victim.

Our participants' revealed preferences differ in important ways from those of more commonly investigated Western samples. In our study, almost all participants chose to expropriate the earnings of another from a neutral outgroup and about half show concerns for ingroup members' welfare. The latter is akin to the rate of fair choices in Western samples with comparable payoff structures and without a salient group identity (Abbink and Doğan 2019; Bartling, Fischbacher,

and Schudy 2015; Dana, Weber, and Kuang 2007; Doğan 2019). Thus, a universal group identity could be the reason why a large proportion of participants in W.E.I.R.D. countries act fair towards others or avoid harming them. Our results suggest that such behavior vanishes if stronger and more exclusive group identities are salient.

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Online Appendix

Verbal instructions

Payment procedures

Data and detailed analysis

Verbal instructions

Instructions were given verbally by a translator with the experimenter present to answer any questions.

You will make four decisions. We will pick one decision and you will get money on the basis of that decision. The first decision is as follows.

First decision:

You will be in a group with two other people from [ingroup name]. There is no way of knowing who else is in your group. But the two other persons in your group are also [ingroup name].

Everyone in your group is given 10 red coins [show coins]. One coin is worth 2 birr. That means that your 10 coins together are worth 20 birr. The decision that we will ask you to make is this: here in front of you, you see your 10 coins, the 2nd group member's 10 red coins, and the 3rd group member's 10 red coins. The 2nd group member is [ingroup name], and the 3rd group member is [ingroup name]. You can choose to take 5 red coins from the 3rd group member. You can also choose to take nothing. The second group member will also choose whether they want to take 5 coins from the 3rd group member.

> If both of you take 5 coins from the third group member, then you will have 15 coins each, and the 3rd person will have no coins. If you decide to take nothing, or the 2nd group member decides to take nothing, then all three group members keep their 10 coins.

Your decision will remain private. You will not learn the decisions of the other members of your group neither during nor after the experiment.

Payment:

You and the 2nd group member in your group make the decision just described. You will earn 15 coins if both you and the 2nd group member chose to take. The 3rd group member will then earn nothing. If you chose not to take, or the 2nd group member chose not to take, all three group members earn 10 coins each.

Any questions?

Second decision:

Now, you will make the second decision. Remember, we will pick one of the decisions and pay for that. Now, you are in a group with one person from [ingroup name], and one person from [outgroup name]. There is no way of knowing who else is in your group.

Everyone in your group is given 10 fresh red coins [show coins and make it clear that they are not the earnings from the previous part]. One coin is worth 2 birr. That means that your 10 coins together are worth 20 birr. The decision that we will ask you to make is this: here in front of you, you see your 10 coins, the 2nd group member's 10 red coins, and the 3rd group member's 10 red coins. The 2nd group member is [ingroup name], and the 3rd group member is [outgroup name]. You can choose to take 5 red coins from the 3rd group member. You can also choose to take nothing. The second group member will also choose whether they want to take 5 coins from the 3rd group member.

> If both of you take 5 coins from the third group member, then you will have 15 coins each, and the 3rd person will have no coins. If you decide to take nothing, or the 2nd group member decides to take nothing, then all three group members keep their 10 coins.

Your decision as before will remain private. You will not learn the decisions of the other members of your group neither during nor after the experiment.

Payment:

You and the 2nd group member in your group make the decision just described. You will earn 15 coins if both you and the 2nd group member chose to take. The 3rd group member will then earn nothing. If you chose not to take, or the 2nd group member chose not to take, all three group members earn 10 coins each.

Any questions?

Third decision:

Now, you will make the third decision. Remember, we will pick one of the decisions and pay for that. Now, you are in a group with one person from [outgroup name], and one person from [ingroup name]. There is no way of knowing who else is in your group.

Everyone in your group is given 10 fresh red coins [show coins and make it clear that they are not the earnings from the previous parts]. One coin is worth 2 birr. That means that your 10 coins together are worth 20 birr. The decision that we will ask you to make is this: here in front of you,

you see your 10 coins, the 2nd group member's 10 red coins, and the 3rd group member's 10 red coins. The 2nd group member is [outgroup name], and the 3rd group member is [ingroup name]. You can choose to take 5 red coins from the 3rd group member. You can also choose to take nothing. The second group member will also choose whether they want to take 5 coins from the 3rd group member.

> If both of you take 5 coins from the third group member, then you will have 15 coins each, and the 3rd person will have no coins. If you decide to take nothing, or the 2nd group member decides to take nothing, then all three group members keep their 10 coins.

Your decision as before will remain private. You will not learn the decisions of the other members of your group neither during nor after the experiment.

Payment:

You and the 2nd group member in your group make the decision just described. You will earn 15 coins if both you and the 2nd group member chose to take. The 3rd group member will then earn nothing. If you chose not to take, or the 2nd group member chose not to take, all three group members earn 10 coins each.

Any questions?

Fourth decision:

Now, you will make the fourth decision. Remember, we will pick one of the decisions and pay for that. Now, you are in a group with two persons from [outgroup name]. There is no way of knowing who else is in your group.

Everyone in your group is given 10 fresh red coins [show coins and make it clear that they are not the earnings from the previous parts]. One coin is worth 2 Birr. That means that your 10 coins together are worth 20 Birr. The decision that we will ask you to make is this: here in front of you, you see your 10 coins, the 2nd group member's 10 red coins, and the 3rd group member's 10 red coins. The 2nd group member is [outgroup name], and the 3rd group member is also [outgroup name]. You can choose to take 5 red coins from the 3rd group member. You can also choose to take nothing. The second group member will also choose whether they want to take 5 coins from the 3rd group member.

If both of you take 5 coins from the third group member, then you will have 15 coins each, and the 3rd person will have no coins. If you decide to take nothing, or the 2nd group member decides to take nothing, then all three group members keep their 10 coins.

Your decision as before will remain private. You will not learn the decisions of the other members of your group neither during nor after the experiment.

Payment:

You and the 2nd group member in your group make the decision just described. You will earn 15 coins if both you and the 2nd group member chose to take. The 3rd group member will then earn nothing. If you chose not to take, or the 2nd group member chose not to take, all three group members earn 10 coins each.

Any questions?

After Game:

Finally, remember you must keep the card with your number on it. After everyone from your group and [outgroup name] has played their game I will look at what everyone did and see which decisions are paid for. I will come here and pay you the coins you won.

Payment procedures

We picked one of the 3 conditions randomly for payment according to the following rules. If the 3rd condition is picked, randomly determine which group is paid by the 3rd and which by the 4th condition.

Consider there are 24 people in group 1, and 24 in group 2. Let us number the subjects from 1 to 24, and let's denote the group number as 1 or 2. Person 1 from group 1 is shown as 1-1, person 1 from group 2 as 1-2 etc.

Condition 1: In condition 1, everyone is from the same group, and we pay them as follows: Each row is a matching group. This is the solution for group 1. We pay each row according to the outcome of the multiple dictator game, that is check what group members 1 and 2 do and determine the payments of all three players. The identical solution applies to group 2. Notice that persons 1,3,5,7,….17,19,21,23 get paid twice, once as a decision-maker, once as a victim. They do not know that they are paid as a victim, so for them it is a surprise extra.

Table A1. Payment procedure for condition 1

Group member 1	*Group member 2*	*Victim*
1-1	2-1	3-1
3-1	4-1	5-1
5-1	6-1	7-1
7-1	8-1	9-1
9-1	10-1	11-1
11-1	12-1	13-1
13-1	14-1	15-1
15-1	16-1	17-1
17-1	18-1	19-1
19-1	20-1	21-1
21-1	22-1	23-1
23-1	24-1	1-1

Condition 2: In condition 2, the decision-makers are from the same group, and the victim is outgroup. Each row is a matching group. Below you see the solution for group 1 and group 2. We

pay each row according to the outcome of the multiple dictator game, that is check what group members 1 and 2 do and determine the payments of all three players. The identical solution applies to group 2. Notice that persons 1,3,5,7,….17,19,21,23 in each group get paid twice, once as a decision-maker, once as a victim. They do not know that they are paid as a victim, so for them it is a surprise extra.

Table A2: Payment procedure for condition 2

Solution for group 1		
Group member 1	*Group member 2*	*Victim*
1-1	2-1	3-2
3-1	4-1	5-2
5-1	6-1	7-2
7-1	8-1	9-2
9-1	10-1	11-2
11-1	12-1	13-2
13-1	14-1	15-2
15-1	16-1	17-2
17-1	18-1	19-2
19-1	20-1	21-2
21-1	22-1	23-2
23-1	24-1	1-2

Solution for group 2		
Group member 1	*Group member 2*	*Victim*
1-2	2-2	3-1
3-2	4-2	5-1
5-2	6-2	7-1
7-2	8-2	9-1
9-2	10-2	11-1
11-2	12-2	13-1
13-2	14-2	15-1
15-2	16-2	17-1
17-2	18-2	19-1
19-2	20-2	21-1
21-2	22-2	23-1
23-2	24-2	1-1

Condition 3 and 4:

In condition 3, one decision-maker is outgroup, and the victim is ingroup. Here the solution does not work for both groups at the same time. So if condition 3 is chosen to be paid, we would pay some of them using condition 3 and some with 4.

Each row is a matching group. Below you see the solution for both groups. We pay all players according to the outcome of the multiple dictator game, that is check what group members 1 and 2 do and determine the payments of all three players. Notice: group member 1 makes the decision for condition 3, and group member 2 makes the decision for condition 4. Label the group 1 members who played condition 3 as from 1 to 12, and group 1 members who played condition 4 from 13 to 24. Likewise for group 2.

Notice that players 1,3,5,7,…23 in both group 1 and group 2 are paid twice, once as a decision-maker, once as a victim. They do not know that they are paid as a victim, so for them it is a surprise.

Solution for both groups are depicted in Table A3.

Table A3. Payment procedure for conditions 3 and 4

Pay this member	*Do not pay this member*	*Pay this member*	*Pay this member*	*Do not pay this member*	*Pay this member*
Group member	*Group member*	*Victim from Group 1*	*Group member*	*Group member*	*Victim from Group 2*
1-1	13-2	23-1	1-2	13-1	23-2
2-1	14-2	21-1	2-2	14-1	21-2
3-1	15-2	19-1	3-2	15-1	19-2
4-1	16-2	17-1	4-2	16-1	17-2
5-1	17-2	15-1	5-2	17-1	15-2
6-1	18-2	13-1	6-2	18-1	13-2
7-1	19-2	11-1	7-2	19-1	11-2
8-1	20-2	9-1	8-2	20-1	9-2
9-1	21-2	7-1	9-2	21-1	7-2
10-1	22-2	5-1	10-2	22-1	5-2
11-1	23-2	3-1	11-2	23-1	3-2
12-1	24-2	1-1	12-2	24-1	1-2

Data and detailed analysis

Table A4 contains the full data of the experiment.

Table A4. Participants' choice data per group pairing. Participants' choices are depicted in the order of Out-In, In-In, Out-Out, and In-Out group constellations, where 1 denotes a take decision, and 0, not take decision. Each cell depicts the number of participants per choice category. Daasanach and Nyangatom are groups with strong group identities, and Highlanders have a weak group identity. In a group pairing, the first group name indicates the experimental group and the second group name indicates the outgroup participants were facing when making their decisions. For example, the data collected from Daasanach when they were facing Nyangatom is depicted in the column Daasanach-Nyangatom. Types are determined according to the model presented in the paper and Table A2; low bias refers to a low level of μ_i, and high bias refers to a high level of μ_i.

		Enmity		*Neutral*	
Choices	*Type*	*Daasanach-Nyangatom*	*Nyangatom-Daasanach*	*Nyangatom-Highlanders*	*Highlanders-Nyangatom*
1-1-1-1	Selfish	10	15	5	21
0-1-1-1	Low bias	6	10	10	10
0-0-1-1	High bias	28	20	22	13
0-0-0-0	Fair	0	0	1	1
0-0-1-0	Other	2	0	2	0
1-0-1-0	Other	0	1	0	0
1-0-0-1	Other	1	0	0	0
1-0-1-1	Other	0	2	7	2
0-1-0-1	Other	1	0	1	0
		N=48	N=48	N=48	N=48

To compare the outgroup victims to ingroup victims, we pool the Out-Out and In-Out data and compare this to the pooled data of Out-In and In-In. In particular, pooled outgroup victim data indicates whether a participant chose expropriation 0, 1 or 2 times in total in the Out-Out and In-Out decisions, and likewise pooled ingroup victim data indicates whether a participant chose expropriation 0, 1 or 2 times in total in the Out-In and In-In decisions. Table A5 depicts the

corresponding expropriation percentages and the p-values of the Mc-Nemar tests. The results are qualitatively similar using other specifications.

Table A5. Expropriation rates of an ingroup victim, an outgroup victim, and the statistical comparison across categories.

	Victim ingroup vs. outgroup	*Mc-Nemar p*
Pooled	103/192 vs. 190/192	< 0.0001
Neutral	46/96 vs. 96/96	< 0.0001
Enmity	57/96 vs. 94/96	< 0.0001
Strong	69/144 vs. 143/144	< 0.0001
Weak	34/48 vs. 47/48	= 0.0002

Finally, Table A6 depicts the participants' choices in the Out-In and In-In conditions separately. The rows in the table correspond to the comparison between the experimental conditions.

Table A6. Number of participants who expropriate in Out-In and In-In constellations and the corresponding p-values based on two-sided test of proportions.

	Out-In	*p-value*	*In-In*	*p-value*
Neutral vs. Enmity	35/96 vs. 29/96	0.3583	48/96 vs 42/96	0.3855
Weak vs. Strong	23/48 vs. 41/144	0.0133	32/48 vs 58/144	0.0015