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Ideological Motives and Group Decision-Making

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Abstract

This paper studies experimentally when and how ideological motives shape outcomes in group decision-making scenarios. Groups play a repeated coordination game in which they can agree on a payoff-dominant or a payoff-dominated but ideologically preferred outcome, or disagree and forego all payoffs. We find that groups which disagree initially are more likely to end up agreeing on the ideologically preferred outcome. We classify subjects into ideologically motivated and payoff motivated types and show that this effect stems from the two types' differential reaction to disagreements. After disagreements, ideologically motivated types are more committed and steer the group towards their preferred outcome. Heterogeneous groups disagree more often and, thus, foster agreements on the ideologically motivated outcome. Our treatments show that, because of this mechanism, large groups are more likely to implement the ideologically preferred outcome than small groups. Furthermore, we show that individual ideological commitment is stronger when it targets the prevention of an outcome in conflict with the ideology than when it targets the implementation of an outcome aligned with the ideology. Theoretically, we study whether fixed or malleable ideological preferences can explain our results.

JEL-Codes: C920, D010, D700, D910.

Keywords: ideology, group decision-making, coordination, heterogeneous types.

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1 Introduction

Ideological beliefs on, e.g., political or moral issues, play an important role in individual decision making (Bénabou and Tirole, 2016; Golman et al., 2016). They influence, for example, voting decisions (Merlo and De Paula, 2017), court decisions (Sunstein et al., 2007; Gennaioli and Shleifer, 2007; Berdejó and Chen, 2017), brand and media consumption decisions (Khan et al., 2013; Gentzkow and Shapiro, 2011), and even organ donation decisions (Chan, 2019). However, also groups, such as governments, management teams, juries, editorial boards, or families often have to decide over outcomes that contain an ideological element. When such groups consist of members with heterogeneous ideological beliefs, the question arises when and how ideological motives shape outcomes in group decision-making scenarios.¹

Answering this question is especially important at a time of increasing ideological polarization.² Furthermore, ideological considerations nowadays enter spheres that were previously seen as unideological, such as the workplace.³ For example, a newspaper’s editorial board might face the decision whether to publish a wide spectrum of political opinions on a given topic or whether to solely cater to the ideological convictions of its readers and workers. The outcome of that decision will depend on the distribution of the board members’ ideological beliefs and their commitment to those beliefs. Furthermore, in times of public feedback through social media, an increasing number of other stakeholders, such as the workforce, might be able to influence the decision.⁴ Thus, there exists a need to understand when and how ideologically motivated people influence group decision-making outcomes and which group characteristics—such as the number of people with influence on the decision—foster or deter their influence.

In this paper, we experimentally study the determinants of group decisions when groups face a trade-off between monetarily or ideologically beneficial outcomes. As a starting point, we focus on groups that lean ideologically in one direction and, thus, conflict arises between more and less ideologically motivated people.⁵ On the individual level, our primary interest lies

¹Studies across many domains show that, compared to individuals, groups make decision that are more in line with standard game-theoretic predictions, and that this is because group decisions are less likely to be influenced by biases, cognitive limitations, or social considerations (for overviews, see Charness and Sutter (2012) and Kugler et al. (2012). If, when, and how ideological considerations shape group outcomes, is, however, a largely open question.

²One area of such polarization is politics (Fiorina and Abrams, 2008). For example, in 2019, 78% of respondents of a nationally representative survey say divisions between Republicans and Democrats in the U.S. are increasing, while just 6% say they are decreasing (Pew Research Center, 2019). Furthermore, fully 73% say that most Republican and Democratic voters not only disagree over plans and policies, but also disagree on “basic facts”, and an increasing share of partisans sees members of the other party as “closed-minded” and “immoral”.

³See, e.g., <https://www.theatlantic.com/ideas/archive/2020/10/should-professional-be-political/616810/> and <https://hbr.org/2020/02/how-do-consumers-feel-when-companies-get-political>.

⁴For example, after the New York Times published a controversial opinion column calling for military intervention against protestors in U.S. cities, backlash from reporters and staffers led to the announcement that the column “did not meet our standards” and the resignation of editorial page editor James Bennet (<https://www.washingtonpost.com/media/2020/06/03/new-york-times-tom-cotton/>). Subsequently, former New York Times op-ed staff editor Bari Weiss lamented in her resignation letter that “[w]hat rules that remain at The Times are applied with extreme selectivity. If a person’s ideology is in keeping with the new orthodoxy, they and their work remain unscrutinized. Everyone else lives in fear of the digital thunderdome.” (<https://www.bariweiss.com/resignation-letter>).

⁵Ideologically biased group compositions are better suited to cleanly identify the mechanisms behind such group decisions compared to groups with opposing ideologies. Biased groups often arise when groups are formed endogeneously, e.g., through self-selection. For example, journalists join newspapers, people choose friends, and politicians choose parties according to whether the group aligns with their preferred ideology. Of course, this does not hold for all groups, especially not those that are exogenously determined, like panels of judges and certain

in understanding how different types of individuals—such as *ideologically motivated* and *payoff motivated* types—act in such situations and how they solve potential initial disagreement over time. On the group level, we seek to understand the determinants of group decision outcomes and potential ideological dominance. Furthermore, we study how the group size and composition affect individual behavior and agreement outcomes.

To address these questions, we employ a laboratory experiment. As a proxy for an ideologically charged outcome, we use a donation to an organization that a considerable fraction of subjects in our student subject pool opposes—the National Rifle Association (NRA).⁶ The experiment consists of two parts: Part I uses an individual donation choice to elicit the subjects’ views about the organization. Our elicitation method affords us to classify subjects into *ideologically motivated* types, i.e., those who are willing to incur costs to donate nothing to the organization, and *payoff motivated* types, i.e., those who donate some positive amount if it increases their own payoff but who are not willing to sacrifice own payoff to increase the donation further.

Part II implements the treatment variation using a coordination game that is repeated for 20 periods in fixed groups. Each period, group members choose between two options, which we call the *payoff motivated* and the *ideologically motivated* option. With their choice group members can either agree on a *payoff motivated* outcome that generates a high payoff for each group member but comes with a negative externality—again a donation to the organization—or on an *ideologically motivated* outcome that generates a lower payoff but avoids the externality. Finally, if groups disagree, no donation is made and group members receive no payoffs. Our treatments vary whether the groups consist of two (N2–NRA) or four (N4–NRA) players. In addition, the random formation of groups, in combination with the independent type-classification in Part I, exogenously varies the fraction of *ideologically motivated* types within a group, allowing us to study how the group composition affects behaviors and group outcomes.

We find that the two types behave very differently. Not surprisingly, *payoff motivated* types are initially more likely to choose *payoff motivated* option than *ideologically motivated* types. Interestingly, however, over time, the fraction of *ideologically motivated* types who choose the *payoff motivated* option remains constant, while the corresponding fraction of *payoff motivated* types decreases significantly in both treatments. Across treatments, there is no significant difference in the choices of *ideologically motivated* types, but *payoff motivated* types choose the *payoff motivated* option significantly less often in treatment N4–NRA compared to treatment N2–NRA. The mechanism behind these findings lies in the differential reaction of *payoff motivated* and *ideologically motivated* types to disagreement. After disagreement, *payoff motivated* types are significantly more likely to give in, while *ideologically motivated* types are steadfast in their insistence on the *ideologically motivated* outcome, which we interpret as evidence for *individual ideological commitment*.

Ideologically motivated types, therefore, have a bigger influence on the group outcome than *payoff motivated* types. In fact, one *ideologically motivated* type in a group of four suffices to

committees. For example, Chen et al. (2016) study the voting behavior of randomly composed and ideologically diverse panels of judges and find that ideological disagreements drive dissents against the panel’s decision.

⁶Note that we take our subjects’ ideological beliefs as given and don’t ask how they arise, or whether they are of political, moral, or religious nature. Bénabou (2008) shows theoretically how ideologically distorted beliefs regarding the proper scope of government intervention can exist in equilibrium.

decrease the likelihood of the *payoff motivated* outcome from 100 to 43 percent, while one *payoff motivated* in a group of four only increases the same likelihood from 0 to 8 percent. Thus, we observe the emergence of *ideological dominance* in groups. The effect crucially depends on the prevalence of disagreements. Since small groups less often feature a heterogeneous type composition and thus initially disagree less often, groups of two are about 50% more likely to agree on the *payoff motivated* outcome compared to groups of four.⁷

To test whether individual behavior and group outcomes evolve differently when the *ideologically motivated* outcome does not prevent a negative externality to an organization *in conflict* with the ideology, but generates a positive externality to an organization *aligned* with the ideology, we designed and conducted an additional treatment (“N4-ET”). Treatment N4-ET differs from treatment N4-NRA only insofar as Part I and Part II generate a donation to the anti-gun lobby organization “Everytown for Gun Safety” instead of the NRA. In Part II, the donation is generated whenever all group members agree on the *ideologically motivated* outcome, which again grants a low payoff to themselves. We find that the type of externality indeed matters strongly for the subjects’ behavior and group outcomes. In Part I, significantly fewer subjects are willing to sacrifice own money to increase the donation to Everytown and, thus, much fewer are classified as *ideologically motivated* types. In Part II, those that are classified as *ideologically motivated* types are significantly less committed and more willing to give in compared to *payoff motivated* types, the opposite of what we found before. Consequently significantly fewer *ideologically motivated* outcomes accrue in treatment N4-ET. Comparing identical group compositions across treatments reveals that we cannot detect *ideological dominance* in treatment N4-ET. Hence, whether an externality is aligned or in conflict with an ideology strongly matters for individual ideological commitment and thus group outcomes.

While our experiment was not specifically designed to test different preference theories against each other, our results are also informative about the subjects’ underlying ideological preferences. In Part II, subjects play a coordination game with two Pareto-ranked Nash equilibria. If all subjects had standard preferences of pure monetary self-interest, all subjects would be equally likely to choose the *payoff motivated* option, independent of changes in group size, composition, or the nature of the externality. This is clearly not what we find. Part of our subjects reject the implementation of the *payoff motivated* outcome, even at high monetary costs to themselves.

That some people care not only about their own monetary payoff but also about other dimensions of the implemented outcomes is, of course, well established. For instance, many people are averse to inequity (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000), to violating a social norm (Elster, 1989; Krupka and Weber, 2013), to harming their self-image and identity (Benabou and Tirole, 2011), or to specific acts such as lying (Gneezy et al., 2018; Abeler et al.,

⁷Social psychology has long recognized that, after deliberation and discussion, individuals within groups often hold more extreme views than when alone (an effect called *group polarization*). As a result, groups often make more extreme choices than individuals (an effect called *choice shift*) (see, e.g., Myers and Lamm, 1976; Isenberg, 1986; Zuber et al., 1992). Most relatedly, Kaplan and Miller (1987) find that group polarization and choice shifts are largest for judgmental issues, such as deciding on moral positions, under unanimity rule. They speculate that this is due to individuals who hold extreme positions and who are able to persuade others when unanimity rule gives them the power to hold out. We contribute to this literature by opening up this black box and by providing evidence for which types of individuals are more steadfast, and when, and how their steadfastness can lead to choice shifts on the outcome level.

2019; Khalmetski and Sliwka, 2019). In our case, subjects seemingly bear psychological costs for implementing outcomes that are in conflict with their ideology and, thus, exhibit *ideological preferences*. What is less well understood, however, is whether, in group contexts such as ours, those costs are fixed, or react to group characteristics such as the group size. In fact, a growing literature suggests that psychological costs in the moral domain are malleable and context-dependent (cf. Dana et al., 2007; Shalvi et al., 2011). Specifically, existing evidence suggests that groups implement payoff-maximizing but immoral outcomes more frequently than individuals. To explain this finding, it has been suggested that acting in groups allows people to exploit moral wiggle room and diffuse responsibility (Dana et al., 2007; Hamman et al., 2010; Bartling and Fischbacher, 2012; Conrads et al., 2013; Behnk et al., 2019; Falk et al., 2020), to apply higher levels of reasoning (Sutter, 2009), to satisfy a preference for collaboration (Weisel and Shalvi, 2015), or to help others (Gino et al., 2013; Danilov et al., 2013). In addition, group members can convince others of the acceptability of immoral behavior through communication (Luhan et al., 2009; Kocher et al., 2018), or simply by letting others observe their own behavior (Gino et al., 2009; Soraperra et al., 2017).⁸

Many of the suggested explanations also predict that members of large groups act less moral than those of small groups. In our setting, however, the group size doesn’t impact the *ideologically motivated* types’ choices. Even though, in groups of four compared to groups of two i) the efficiency gain of implementing the *payoff motivated* outcome is larger, ii) one can help more other group members by choosing the *payoff motivated* option, iii) responsibility is diffused among more group members, and iv) it is more likely to observe a *payoff motivated* choice by others, group size has no effect on the frequency with which *ideologically motivated* types choose the *payoff motivated* option. Thus, on this dimension, the psychological costs of implementing an ideologically averse outcome seem fixed. On the other hand, however, we observe that groups are much less likely to implement an *ideologically motivated* outcome in treatment N4–ET. Thus, the psychological costs of implementing an ideologically conflicting externality seem to be bigger than the psychological benefits of implementing an equally-sized but ideologically aligned externality. This result shows that the choice of externality is of crucial importance and should be considered seriously when studying related research questions.

The paper proceeds as follows: Section 2 summarizes the experimental design. Section 3 develops predictions depending on different preference specifications. The results are presented in Section 4. Section 5 summarizes the design of and the results from the additional treatment. Section 6 discusses the findings and Section 7 concludes.

2 Experimental design

The experiment consists of two parts. Part I uses an incentivized individual decision to study how the subjects perceive our proxy for an ideologically charged outcome absent any strategic considerations and allows us to classify subjects into different types. Part II, our main part,

⁸In some settings, it is possible that a person’s moral costs increase in group settings, e.g., when social-image concerns are present. For example, Cason and Mui (1997) find that team decisions after face-to-face discussions are more altruistic and other-regarding than individual decisions. However, such channels should not be present in our study as we guarantee anonymity to all subjects.

administers the two treatment variations via a coordination game.

2.1 Proxy for an ideologically charged outcome

In the experiment, subjects repeatedly face trade-offs between own money and the implementation of an ideologically charged outcome. Our proxy for this outcome needed to fulfil three main requirements: First, it should impose high ideological costs on at least some of our subjects. Second, the variance in ideological costs should be large enough to allow us to study disagreements in groups. Third, subjects should ideologically lean in one direction to mirror situations in which group members self-selected according to their ideology. Finally, to enable future replication, how subjects feel about the ideologically charged outcome should be stable over time and not depend on current events or personalities.⁹

To fulfil these requirements, we let subjects generate donations to the National Rifle Association (NRA), which is a U.S. nonprofit organization that advocates for gun ownership rights.¹⁰ As of February 2018, the NRA had approximately 5 million members in the U.S. and, in 2016, generated \$163.5 million in membership dues and \$203.4 million in other revenues such as donations (Ingraham, 2018). Gun control and ownership is a highly divisive and ideologically charged topic. For example, in 2017, 47% of respondents in a nationally representative survey in the U.S. state that protecting the right to own guns is more important than to control gun ownership, and 42% state that they live in a household which owns at least one gun (Pew Research Center, 2017). Regarding the NRA, 44% of respondents say it has too much influence over gun legislation, 40% say it has the right amount of influence, and 15% say it has too little influence. Among students, however, the NRA is often viewed more critically than among the general population. Therefore, donations to the NRA were previously used as a proxy for “bad” outcomes by Ariely et al. (2009). Similarly, Kajackaite (2015) used donations to the NRA in the same subject pool as ours and also conducted a survey among potential subject pool members (students of the University of Cologne in Germany). 93 out of 100 respondents stated negative views regarding the NRA. Thus, donations to the NRA fulfil the stipulated requirements from above.¹¹

Importantly, in all individual and group decision involving a potential donation, each participant had the power to prevent the respective donation from being implemented. Hence, we ensured that all donations have the explicit consent of all concerned participants. Participants received a short description of the NRA and its goals before making their decisions.¹²

⁹The last requirement is one reason why we believe donations to a political party are not a good proxy for an ideologically charged outcome. How strongly subjects feel about a party at a given point in time can be influenced by whether there is an upcoming election, whether the party is currently in power, or by whom it is currently led.

¹⁰Letting subjects generate donations to organizations to induce them to care about an outcome independent of its monetary consequences is a standard approach in experimental economics (see, e.g., Eckel and Grossman, 1996; Imas, 2014; Bartling and Özdemir, 2017; DellaVigna and Pope, 2018; Cassar, 2019; Sutter et al., 2020).

¹¹At the time the experiments were run, the University of Cologne did not have an IRB. After an IRB was institutionalized at the Faculty for Management, Economics, and Social Sciences of the University of Cologne, the author sought discussion and guidance from the IRB on whether similar experiments were possible in the future. The IRB did not object but outlined and suggested further experiments. Nevertheless, in order to avoid the impression that research funds were used to support political organizations, the author self-financed all donations that were generated for the NRA. In addition, treatment N4-ET generates donations to an opposing political organization and thus ensures that the experiment is, overall, politically neutral.

¹²English translations of the original German instructions for Part I and the N4-NRA treatment of Part II, together with screenshots of the decision relevant stages of Part I and Part II can be found in Appendix B.

2.2 Part I – Individual choice

In Part I, each subject chooses one of eleven options. The choice determines the subject’s own payoff and the size of a donation to the NRA. Subjects can donate any integer amount between zero and ten Euro. A subject who chooses a donation of zero Euro earns one Euro. With each donated Euro, the individual payoff increases in increments of €0.25 and reaches a maximum of €2.25 for donations of five Euro. For each donated Euro above five Euro, a subject’s own payoff decreases, again in increments of €0.25, and reaches a minimum of one Euro for the greatest possible donation of ten Euro.¹³ Table 1 summarizes all possible payoff consequences in Part I.

Table 1: Payoff consequences of choices in Part I

Option	0	1	2	3	4	5	6	7	8	9	10
Own payoff (in €)	1	1.25	1.50	1.75	2	2.25	2	1.75	1.50	1.25	1
Donation (in €)	0	1	2	3	4	5	6	7	8	9	10

A subject’s choice is informative about his or her views regarding the organization. Subjects who choose Option 5 maximize their own payoff and signal that they do not care enough about increasing or decreasing the donation to the organization to forego own money. Subjects who choose Options 0-4 sacrifice own payoff to decrease the donation and thus signal a distaste of the organization. Similarly, subjects who choose Options 6-10 forego own payoff to increase the donation and thus signal that they like the organization.

2.3 Part II – Coordination game

At the beginning of Part II, subjects are randomly assigned to groups. Subjects then play a coordination game for twenty periods with fixed groups. In each period, all group members face the identical choice between a *payoff motivated* and an *ideologically motivated* option.¹⁴ If all the group members choose the *payoff motivated* option, 8 Euro are donated to the NRA and each group member receives a payoff of 8 Euro. If all the group members choose the *ideologically motivated* option, no donation is implemented and each group member receives 2 Euro. Finally, if the group members choose different options and thus disagree on which outcome should be implemented, no donation is made and participants receive zero Euro. Hence, the following three group outcomes are possible: disagreement (i.e., coordination failure), agreement on the *payoff motivated* outcome, and agreement on the *ideologically motivated* outcome.

After subjects made their choice, we elicit their beliefs about the behavior of the other group members in the current period. Subjects are asked to guess how many of their fellow group members chose Option 1 or Option 2, respectively. If their guess coincides with the actual frequency of choices, subjects earn €0.5. Otherwise they earn €0. At the end of each period, subjects are informed about the individual choice of each of their fellow group members and the implemented outcome. Hence, in in both treatments, subjects could reconstruct the history of choices of their fellow group members and build a reputation for taking certain choices.¹⁵

¹³We chose relatively small own-payoff differences across choices to minimize the chance that payoff differences in Part I lead to income effects in Part II.

¹⁴In the instructions and on the computer screens, the two options were neutrally labelled as “Option 1” and “Option 2”.

¹⁵This is straightforward in treatment N2–NRA. In treatment N4–NRA, each group member is assigned a letter,

At the end of the experiment, the results of the coordination game, i.e., the participants' payoffs and the resulting donation of one randomly selected period are implemented. To avoid hedging, an independently and randomly selected period implements the payoffs from the belief elicitation.

2.4 Treatments

We employ a between-subjects design to administer our two treatments. The treatments solely vary whether, in Part II, the subjects are assigned to groups of two or to groups of four members. We label the two treatments N2–NRA and N4–NRA.

2.5 Procedures

Before the subjects entered the lab, they randomly drew a place card that specified at which computer terminal to sit. Subjects were informed that the experiment consists of two parts, but received instructions about the content of Part II only at the beginning of that part. The instructions for each part were read aloud to ensure common knowledge. Subjects had to correctly answer comprehension questions before each part could start.

We conducted a total of 10 sessions: two sessions in November 2016 and another eight sessions in November and December of 2017. All sessions were conducted at the Cologne Laboratory for Economic Research (CLER) of the University of Cologne. We ran the experiments with the software “z-Tree” (Fischbacher, 2007) and recruited participants from the student subject pool via ORSEE (Greiner, 2015). None of them participated in more than one session. Overall, 278 subjects participated in the experiment: 106 in treatment N2–NRA and 172 in treatment N4–NRA. Given our group sizes, we therefore obtained a total of 96 independent observations (i.e., groups): 53 in N2–NRA and 43 in N4–NRA. Each session lasted approximately 60 minutes.

After the main parts of the experiment, participants filled out a questionnaire which asked for their age, gender, whether they were students, whether they were studying at the Bachelor's or Master's level, their major, the semester they were in, and if they had any previous knowledge about the respective organization. In addition, we employed the preference panel developed by Falk et al. (2016) to elicit subjects' self-reported risk, time, altruism, reciprocity, and trust preferences.

Subjects were paid out anonymously at the end of the experiment. The total payoff from the experiment equaled the sum of the payoffs in the two parts plus the payment of a show-up fee of €4. Subjects earned, on average, €10.20. After each session, we donated the amount that was generated in this session to the organization. To ensure credibility, participants could provide us with their email addresses to receive a receipt of the donation. We only provided receipts for the sum of donations made in a session and thus could not link subjects' email addresses to their specific donation. Hence, we ensured anonymity and the participants were aware of that.

A, B, C, or D, which is then used to display the group member's individual choice on the feedback screen.

3 Predictions of different preference theories

Before presenting the results, we first discuss the game-theoretic predictions of different preference specifications to gain an understanding into what kinds behaviors and outcomes we can expect in our setting. For simplicity, we focus on strict Nash-equilibria in pure strategies in the stage game. We discuss the predictions in a general theoretical framework that incorporates our specific experimental design. There is a finite set I of n players. Each player simultaneously chooses an action a_i which can either be the *ideologically motivated* option, e , or the *payoff motivated* option, u . Together with the strategy space, the stage game is defined by the following payoff function for each of the n players and a third party c (which represents the payoff for the organization):

$$\pi_i(a_i, a_{-i}) = \begin{cases} \pi^h & \text{if } a_i = a_{-i} = u \\ \pi^l & \text{if } a_i = a_{-i} = e \\ 0 & \text{if otherwise} \end{cases}, \quad \pi_c(a_i, a_{-i}) = \begin{cases} \pi^c & \text{if } a_i = a_{-i} = u \\ 0 & \text{if } a_i = a_{-i} = e \\ 0 & \text{if otherwise} \end{cases}$$

where $\pi^h > \pi^l > 0$, $\pi^c > 0$, and $a_{-i} = (a_1, \dots, a_{i-1}, a_{i+1}, \dots, a_n)$. In the following, we speak of “disagreement” if players choose different actions, of “agreement on the *ideologically motivated* outcome” if all players choose e , and of “agreement on the *payoff motivated* outcome” if all players choose u and the externality is implemented.

Standard Preferences. To develop a first benchmark prediction, we start by assuming that the players solely act to maximize their own monetary payoff (i.e., their preferences can be represented by a utility function of the form $u_i(a_i, a_{-i}) = \pi_i(a_i, a_{-i})$). In this case, our game is a coordination game with two strict Nash equilibria. One equilibrium in which all players choose the *payoff motivated* option and another one in which all players choose the *ideologically motivated* option. Several equilibrium-selection criteria have been proposed to predict which equilibrium will be selected in coordination games. In our case, the equilibria can be Pareto-ranked and *payoff-dominance* selects agreement on the *payoff motivated* outcome (Schelling, 1980). Similarly, *risk-dominance* also selects agreement on the *payoff motivated* outcome as choosing the *payoff motivated* option provides a higher expected payoff when a player is uncertain about the other players’ behavior (Harsanyi and Selten, 1988). Importantly, the set of strict Nash equilibria and the results of the selection criteria are *independent of the number of players*.¹⁶ Hence, independent of whether a selection criteria is applied, standard preferences yield the following prediction for the subjects’ choices in our experiment:

Prediction 1 (Standard preferences). *All players are equally likely to choose the payoff motivated option. The fraction of players who choose the payoff motivated option does not differ between treatments N2–NRA and N4–NRA.*

¹⁶There exists an experimental literature showing that, in minimum-effort coordination games, large groups implement the least efficient equilibrium more often than small groups (see, e.g., Van Huyck et al., 1990; Knez and Camerer, 2000; Weber, 2006). The theoretical argument provided as an explanation for this finding is based on *strategic uncertainty* (Van Huyck et al., 1990; Crawford, 1995; Heinemann et al., 2009). *Strategic uncertainty* arises when, in a coordination game with multiple equilibria, different equilibrium-selection criteria give conflicting predictions and a player is uncertain about which criterion the other players will apply. Importantly, the same argument does not apply to our setup as all selection criteria select the *payoff motivated* outcome. Hence, strategic uncertainty doesn’t exist in our setup and can therefore also not predict a group size effect.

Fixed ideological preferences. Next, we consider that some people care about avoiding the potential externality for ideological reasons and pay psychological costs, $c(\pi_c(a_i, a_{-i}))$, if it is implemented. Such preferences can be represented by the following utility function:

$$u_i(a_i, a_{-i}) = \pi_i(a_i, a_{-i}) - \rho_i c(\pi_c(a_i, a_{-i})) \quad (1)$$

with $c(0) = 0$ and $c(\pi^c) > 0$. The individual-specific preference parameter $\rho_i \geq 0$ describes how much player i cares about the externality.

We categorize players into two types. We say that a player is of *ideologically motivated* type, if his psychological cost of implementing the externality outweighs the monetary benefits of the *payoff motivated* outcome (i.e., it holds that $\rho_i > \frac{\pi^h}{c(\pi^c)} = \bar{\rho}$). An *ideologically motivated* player will choose the, for him, dominant action e , independent of his beliefs about the other players' choices. On the other hand, we say a person is of *payoff motivated* type, if the monetary benefits from implementing the *payoff motivated* outcome outweigh any concerns about the externality (i.e., $\rho_i \leq \bar{\rho}$). A *payoff motivated* player's choice depends on his belief about the other players' choices. He will choose u or e depending on whether he believes the other players do the same.

In the complete information case, all players' preferences are common knowledge.¹⁷ With the potential presence of *ideologically motivated* types in a group, the group composition then matters for the equilibrium predictions: If a group only consists of *payoff motivated* types, the equilibrium predictions are the same as in the standard case and we expect those groups to coordinate on the *payoff motivated* outcome. However, if there is *at least one ideologically motivated* type in a group, all playing u is no Nash Equilibrium as the *ideologically motivated* type would deviate. Hence, in this case, the game ceases to be a coordination game and there exists a *unique* strict Nash equilibrium in which all agree on the *ideologically motivated* outcome.

Since, in our experiment, groups are formed randomly, the group size can impact the group composition and thus the equilibria of the game. Let F be the distribution of ρ_i in the population and let's assume that there exists a fraction of *ideologically motivated* types in the population (i.e., $0 < F(\bar{\rho}) < 1$). If this is the case, then randomly formed larger groups are more likely to entail an *ideologically motivated* type ($1 - F(\bar{\rho})^n < 1 - F(\bar{\rho})^{n+1}$). Since a single *ideologically motivated* type in a group is enough to induce the group to agree on the *ideologically motivated* outcome, larger groups are therefore also more likely to agree on the *ideologically motivated* outcome.

The group size effect for agreement outcomes influences our predictions for the individual choices of the two types in Part II. However, in our experiment, we cannot classify subjects as *ideologically motivated* or *payoff motivated* types based on whether they choose the *ideologically motivated* or *payoff motivated* option in Part II, as those choices could be influenced by their beliefs about the other players' behavior. Therefore, we use the independent individual choice in Part I to classify subjects. We can then test whether the fraction of *payoff motivated* choices in Part II depends on the type classification. Under fixed ideological preferences, this fraction should be constant across treatments for *ideologically motivated* types and change for *payoff*

¹⁷The game in our experiment is repeated over 20 periods with the same group members and feedback about all group members' choices at the end of each period. Therefore, it is reasonable to assume that, over time, preferences are revealed and the complete informations case holds.

motivated types, which yields the following prediction:

Prediction 2 (Fixed ideological preferences). *There exist independently identifiable ideologically motivated players who are less likely to choose the payoff motivated option compared to payoff motivated players. The fraction of ideologically motivated players who choose the payoff motivated option does not differ between treatments N2–NRA and N4–NRA. However, the fraction of payoff motivated players who choose the payoff motivated option is smaller in treatment N4–NRA than in treatment N2–NRA.*

Malleable ideological preferences. While the notion of fixed psychological costs is appealing and makes a clear prediction, many experimental results discussed in the introduction suggest that moral decision making is context-dependent and that group size could be an important factor. In our setting, *ideologically motivated* subjects could care less about the *payoff motivated* outcome in larger groups i) because of the larger payoff gain (24 Euro in groups of four vs 12 Euro in groups of two), ii) because one can help more other group members in larger groups by choosing the *payoff motivated* option, iii) because responsibility is potentially diffused among more people, and iv) because larger groups make it more likely to observe someone else choosing the *payoff motivated* option. Since our experiment does not allow to control for each of these mechanism separately, we simply assume that psychological costs decrease with group size. We capture such malleable ideological preferences with the following utility function:

$$u_i(a_i, a_{-i}, n) = \pi_i(a_i, a_{-i}) - \rho_i c(\pi_c(a_i, a_{-i}), n) \quad (2)$$

with $\frac{\partial c(\pi_c(a_i, a_{-i}), n)}{\partial n} < 0$. Due to the decrease in psychological costs, the threshold value of ρ_i that separates *ideologically motivated* from *payoff motivated* types is greater in larger groups ($\bar{\rho}_n < \bar{\rho}_{n+1}$). Hence, the fraction of *ideologically motivated* types is smaller in larger groups ($1 - F(\bar{\rho}_n) > 1 - F(\bar{\rho}_{n+1})$). Whether larger groups are more likely to entail an *ideologically motivated* type—and thus only allow the *ideologically motivated* outcome as a strict Nash equilibrium—now depends on which of two counteracting forces dominates ($1 - F(\bar{\rho}_n)^n \gtrless 1 - F(\bar{\rho}_{n+1})^{n+1}$). On the one hand, as before, randomly formed larger groups make it more likely to entail an *ideologically motivated* type because a larger sample is drawn. On the other hand, however, that larger sample is drawn from a distribution in which each drawn individual is less likely to be *ideologically motivated*. Hence, whether larger groups are more or less likely to agree on the *payoff motivated* outcome and whether *payoff motivated* types are more or less likely to choose the *payoff motivated* option, depends on the strength of the shift in types. As before, we cannot directly test for changes in the type composition in Part II. Therefore, we make the following alternative prediction using our fixed type-classification from Part I:

Prediction 3 (Malleable ideological preferences). *The fraction of ideologically motivated players who choose the payoff motivated option is smaller in treatment N2–NRA than in treatment N4–NRA. Whether the fraction of payoff motivated players who choose the payoff motivated option is smaller or larger in treatment N4–NRA than in treatment N2–NRA depends on strength of the shift in choices of ideologically motivated types.*

In the next section, we present our results and discuss how they relate to our predictions.

4 Results

The results section is organized as follows: we first summarize subjects' choices in Part I and Part II. Then, we explore the resulting group agreement outcomes in Part II. Finally, we show how different group compositions affect group outcomes in Part II.

4.1 Individual decisions

4.1.1 Part I – Type classification

We hypothesized that some subjects incur ideological costs when implementing a donation to the NRA. Consistent with this, we find that, in Part I, a majority of subjects is willing to sacrifice own money to avoid a donation to the NRA. Subjects' choices are concentrated on two options: Overall, 52.9% of subjects choose Option 0 and, thereby, sacrifice the maximum amount of money to prevent any donation to the NRA. Another 30.2% of subjects choose Option 5, which maximizes their own payoff and implements a donation of five Euro. 16.2% of subjects donate some amount between zero and five Euro (Options 1-4). Only two subjects (<1%) sacrifice own money to donate an amount above five Euro (Options 6-10). Figure 1 shows the fraction of subjects' choices for each of the eleven options in Part I for both treatments separately. As expected, there are no significant treatment differences regarding the distribution and the mean of the donations to the NRA between treatments N2–NRA and N4–NRA (Kolmogorov-Smirnov test, $p = 1.000$; Wilcoxon ranksum test, $p = 0.974$).¹⁸ This is unsurprising, as our treatment differences were not introduced until Part II.

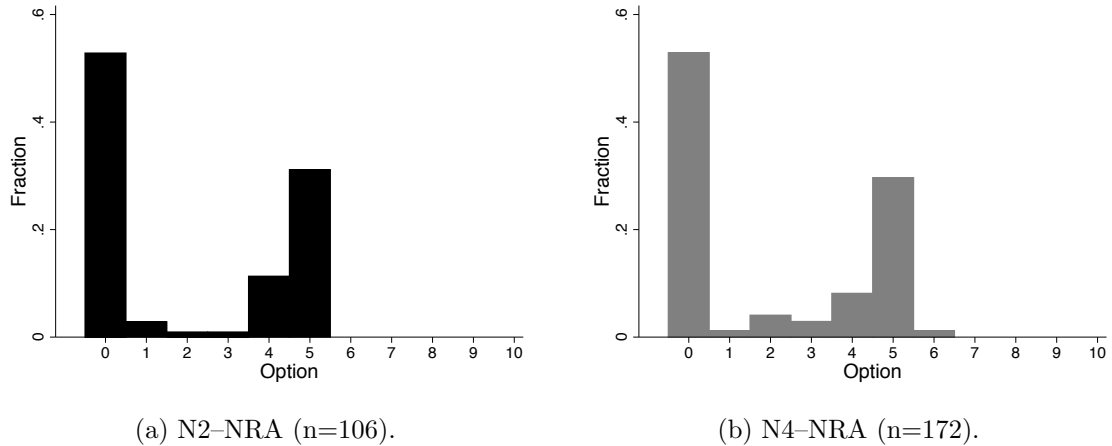


Figure 1: Distribution of choices in Part I.

We classify subjects as *ideologically motivated* if they chose “Option 0” in Part I. Those subjects gave up the maximum amount of own payoff in order to avoid a donation to the NRA.¹⁹ The resulting fractions of *ideologically motivated* types are 52.8% and 52.9% in treatments

¹⁸All reported statistical tests in the paper are two-sided.

¹⁹Table A.1 in Appendix A.1 reports correlations between subjects' individual characteristics and their classification as an *ideologically motivated* type. Female subjects and those with higher self-reported altruism, trust, and positive reciprocity scores are significantly more likely to be classified as *ideologically motivated* types. All other correlations are insignificant. Interestingly, previous knowledge of the NRA is no significant predictor of the classification. This indicates that the information we provided to the subjects about the NRA in the instructions was enough to make an informed decision.

N2-NRA and N4-NRA, respectively, and they do not differ significantly (Chi-squared test, $p = 0.990$). Consequently, we classify subjects as *payoff motivated* if they accept a positive donation to the NRA in order to increase their own payoff.²⁰

4.1.2 Part II - Choices of all subjects

We start our analyzes of Part II with a short summary of the overall behavior of the subjects. Figure 2(a) shows the fraction of subjects that choose the *payoff motivated* option over the 20 periods of Part II.²¹ In Period 1, about 50% of subjects in both treatments choose the *payoff motivated* option without any significant difference across treatment (Pearson χ^2 test, $p = 0.805$). Over time, the fraction of *payoff motivated* choices in treatment N4-NRA decreases significantly, while it remains constant in treatment N2-NRA (Spearman's rho, N2-NRA: $\rho = -0.017$, $p = 0.442$; N4-NRA: $\rho = -0.108$, $p < 0.001$). Due to this difference in the dynamics, in the last five periods, subjects in treatment N2-NRA are about 45% more likely to choose the *payoff motivated* option than subjects in treatment N4-NRA. However, the difference does not reach statistical significance (42% vs 29%, Clustered Pearson χ^2 test, $p = 0.138$). Thus, while there is a strong directional effect, we, so far, cannot reject Prediction 1 which predicted no difference in choices between treatments.²²

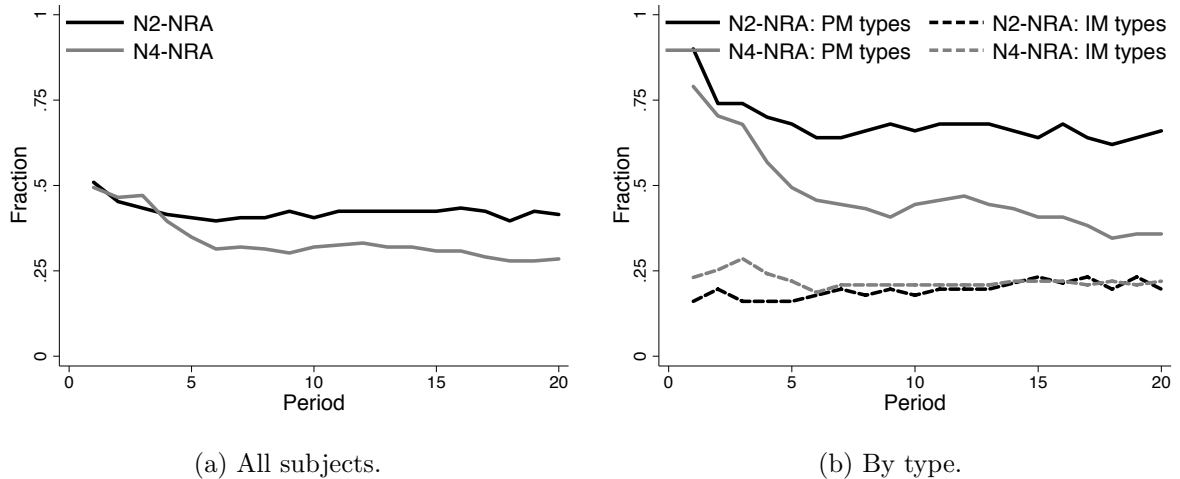


Figure 2: Fraction of *payoff motivated* choices in Part II.

²⁰The following results are quantitatively and qualitatively robust to several other classifications. For example, we don't find quantitative or qualitative differences when classifying those as *ideologically motivated* who choose Options 0-4 in Part I. Details of the robustness checks are provided in Appendix A.2.1.

²¹For brevity, we sometimes use PM and IM for *ideologically motivated* and *payoff motivated*, respectively.

²²The left part of Table A.2 in Appendix A.2 reports the average choices of all subjects for all periods and the four five-period bins, and presents p-values of nonparametric treatment comparisons. Parametric regressions are displayed in Table A.4 in Appendix A.2. Throughout the paper, we use linear regression models. While our outcome variables are mostly binary, we decided against using nonlinear models, such as probit or logit, because we are often interested in interaction effects, and, as Ai and Norton (2003) point out, the magnitude, sign, and statistical significance of the coefficients of interaction terms are not readily interpretable in nonlinear models. We present each regression with and without controls. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). When the dependent variable is a group outcome, these controls are group averages.

4.1.3 Part II - Behaviors of PM and IM types

Next, we use the classification from Part I to study, separately, the behavior of *payoff motivated* and *ideologically motivated* types in Part II. Figure 2(b) separates the subjects' choices by type.²³ We first describe type-based findings that are common to both treatments and then discuss treatment differences. Clearly, in the first period, *payoff motivated* types are significantly more likely than *ideologically motivated* types to choose the *payoff motivated* option in both treatments (N2–NRA: 90.0% vs 16.1%; N4–NRA: 79.0% vs 23.1%, Pearson χ^2 tests, $p < 0.001$). Hence, our classification procedure makes sensible predictions for subjects' behavior at the beginning of Part II.²⁴ Interestingly, the two types differ starkly in the dynamics of their choices over time. The fraction of *ideologically motivated* types who choose the *payoff motivated* option remains surprisingly constant and shows no significant trend in either direction (Spearman's rho, N2–NRA: $\rho = 0.045$, $p = 0.137$; N4–NRA: $\rho = -0.021$, $p = 0.372$). In contrast, the corresponding fraction of *payoff motivated* types decreases strongly and significantly over time (Spearman's rho, N2–NRA: $\rho = -0.080$, $p = 0.012$; N4–NRA: $\rho = -0.197$, $p < 0.001$). Table 2 uses parametric regression methods to corroborate these findings (see columns (3) and (4) for *ideologically motivated* types and columns (7) and (8) for *payoff motivated* types).

Table 2: Individual choices in Part II

Dependent variable:	IM types				PM types			
PM choice	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
N2–NRA	0.194***	0.380	0.162***	0.348	0.681***	0.439	0.749***	0.507**
(constant)	(0.055)	(0.317)	(0.052)	(0.315)	(0.068)	(0.317)	(0.062)	(0.316)
N4–NRA	0.026	0.058	0.074	0.106*	-0.207**	-0.217**	-0.095	-0.106
	(0.076)	(0.066)	(0.068)	(0.057)	(0.094)	(0.093)	(0.082)	(0.082)
Period			0.003*	0.003*			-0.006**	-0.006**
			(0.002)	(0.002)			(0.003)	(0.003)
N4–NRA \times Period			-0.005	-0.005			-0.011**	-0.011**
			(0.003)	(0.003)			(0.005)	(0.005)
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Observations	2.940	2.940	2.940	2.940	2.620	2.620	2.620	2.620
Clusters	83	83	83	83	80	80	80	80
Overall R^2	0.001	0.120	0.002	0.121	0.041	0.077	0.067	0.104

Notes: Random effects GLS regressions with individual random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Across treatments, there is no significant difference in the choices of *ideologically motivated* types in the first period (Pearson χ^2 test, $p = 0.306$), and no significant difference emerges over time. Hence, in all five-period bins, there is no significant difference in the choices of *ideologically motivated* types across treatments (Clustered Pearson χ^2 test, $p \geq 0.248$). Columns (1) and (2) of Table 2 confirm parametrically that there is no overall difference in the choices of *ideologically*

²³The middle and right part of Table A.2 in Appendix A.2 reports the average choices of *payoff motivated* and *ideologically motivated* types in the three periods for all periods and the four five-period bins, and presents p-values of the respective nonparametric treatment comparisons.

²⁴That still 22.9% of *ideologically motivated* types choose the *payoff motivated* option at the beginning of Part II is potentially driven by the fact that the monetary incentive to choose the *payoff motivated* option in Part II is greater than in Part I.

motivated types across treatments.

In the first period, the choices of *payoff motivated* types do also not differ significantly across treatments (Pearson χ^2 test, $p = 0.102$). However, the decrease in *payoff motivated* choices over time is significantly stronger in treatment N4–NRA (see columns (7) and (8) of Table 2). Due to this difference in the trend, significantly less *payoff motivated* types choose the *payoff motivated* option in N4–NRA compared to N2–NRA after period five and overall (Clustered Pearson χ^2 test, $p \leq 0.041$). Columns (5) and (6) of Table 2 confirm parametrically that there is an overall difference in the choices of *payoff motivated* types across treatments. In fact, the decrease in treatment N4–NRA is so strong that, in the last five periods, there is no significant difference anymore between the choices of *payoff motivated* and *ideologically motivated* types (Clustered Pearson χ^2 test, $p = 0.247$). We summarize these findings in Result 1:

Result 1. *The fraction of ideologically motivated types who choose the payoff motivated option remains constant over time. In contrast, the fraction of payoff motivated types who choose the payoff motivated choices decreases significantly in both treatments. Across treatments, there is no significant difference in choices for ideologically motivated types, but payoff motivated types choose the payoff motivated option significantly less often in treatment N4–NRA compared to treatment N2–NRA.*

Results 1 directly relates to our predictions. Clearly, it is possible to identify, using an independent classification procedure, which subjects will be more likely to choose the *payoff motivated* option in Part II. This speaks against the prediction of standard preferences (Prediction 1) and suggests that some subjects are motivated by ideological preferences. Regarding the question whether these preferences are fixed or malleable in our context, the findings support the predictions of fixed ideological preferences (Prediction 2), but not those of malleable ideological preferences (Prediction 3)—*ideologically motivated* types are equally likely to choose the *payoff motivated* option in both treatments. Fixed ideological preferences also correctly predict that the fraction *payoff motivated* types who choose the *payoff motivated* option will decrease with group size.

4.1.4 Part II - Individual ideological commitment

To better understand what generates the differences in choice dynamics between types, we next study whether *payoff motivated* and *ideologically motivated* types differ in their reaction to disagreements.

Choices after initial agreement or disagreement. First, we compare (across individuals) whether the behavior of the two types differs depending on whether their group agreed initially (i.e., in period 1) or not.²⁵ Figure 3 shows, for each treatment, the fraction of subjects that, averaged over all 20 periods, choose the *payoff motivated* option, depending on their type and on whether their groups agreed or disagreed initially.

As expected, if an agreement is already reached in period 1, *payoff motivated* types are, on average, much more likely to choose the *payoff motivated* option compared to *ideologically*

²⁵The random group formation ensures that, whether a group agrees or disagrees initially, is exogenously induced.

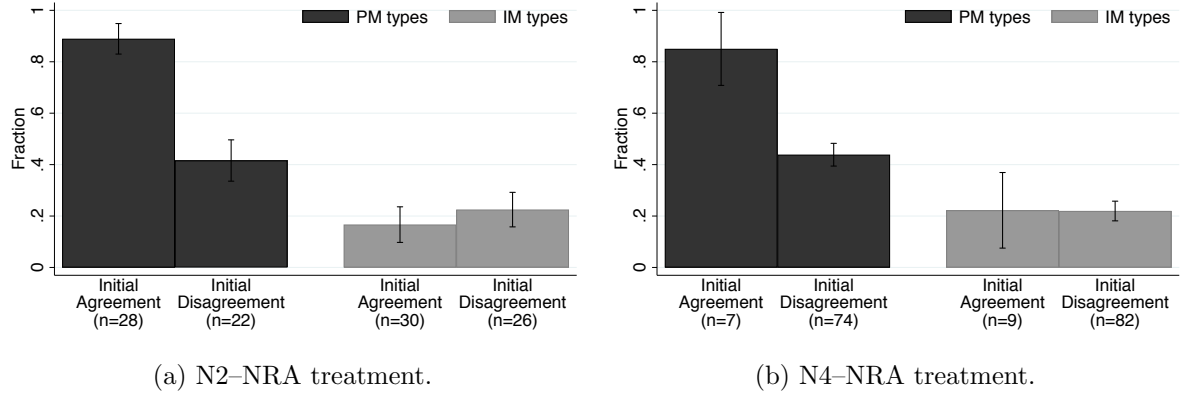


Figure 3: *Payoff motivated* choices by type and initial (dis)agreement.

Notes: The displayed standard errors are not corrected for group clusters.

motivated types (N2-NRA: 89% vs 17%, N4-NRA: 85% vs 22%). However, the two types differ markedly on how they react to an initial disagreement. *Payoff motivated* types whose groups disagree initially are about half as likely to choose the *payoff motivated* option compared to those whose groups agree initially (N2-NRA: 89% vs 42%, N4-NRA: 85% vs 44%). The difference is strongly significant in treatment N2-NRA and, due to the low number of initial agreements, barely insignificant in treatment N4-NRA (Clustered Pearson χ^2 tests, N2-NRA: $p < 0.001$, N4-NRA: $p = 0.116$).²⁶ On the other hand, *ideologically motivated* types who face an initial disagreement continue to choose almost identically as those who don't and the difference is not significant in both treatments (N2-NRA: 17% vs 23%, N4-NRA: 22% vs 22%; Clustered Pearson χ^2 tests, $p \geq 0.603$). Regarding treatment differences, we don't find a significant difference in any of the four possible comparisons (Clustered Pearson χ^2 tests, $p \geq 0.816$).

Table 3: Choices by type and initial (dis)agreement

Dependent variable:	N2-NRA		N4-NRA	
PM choice	(1)	(2)	(3)	(4)
PM type	0.889***	0.720*	0.850***	0.762**
(constant)	(0.077)	(0.375)	(0.153)	(0.308)
Initial disagreement	-0.473***	-0.449***	-0.411**	-0.454***
	(0.110)	(0.120)	(0.166)	(0.157)
IM type	-0.723***	-0.696***	-0.628***	-0.596***
	(0.109)	(0.130)	(0.190)	(0.219)
IM type \times Initial disagreement	0.532***	0.484***	0.409**	0.433**
	(0.121)	(0.146)	(0.193)	(0.217)
Controls	NO	YES	NO	YES
Observations	2.120	2.120	3.440	3.440
Clusters	53	53	43	43
R^2	0.351	0.433	0.100	0.145

Notes: Random effects GLS regressions with individual random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

²⁶Pooling the data from both treatments yields a strongly significant effect (Clustered Pearson χ^2 tests, $p < 0.001$).

Parametric regressions confirm these findings (see Table 3). In both treatments, *payoff motivated* types are significantly less likely to choose the *payoff motivated* option after initial disagreement (see coefficient *Initial disagreement*). On the other hand, *ideologically motivated* types' choices do not differ significantly after initial disagreement (Wald tests, $IM\ type + IM\ type \times Initial\ disagreement = 0$, $p \geq 0.539$).²⁷

Reaction to beliefs. Next, we use the elicited incentivized beliefs to study whether *ideologically motivated* types are more steadfast because their choices are influenced less by their beliefs about the choices of their group members. In each period, we asked subjects how many of their group members they think will choose each of the two option. Figure 4 shows, separately for each treatment, the fraction of subjects' choices that are consistent with their type, depending on those subjects' beliefs about how many of their group members will choose the action that is consistent with their type. For *payoff motivated* (*ideologically motivated*) types the *payoff motivated* (*ideologically motivated*) choice is type-consistent. For example, the lower left dot in Figure 4(a) represents the fraction of *ideologically motivated* types in treatment N2–NRA who choose the *ideologically motivated* option if they believe that the other group member chooses the *payoff motivated* option, and the upper right triangle in Figure 4(b) represents the fraction with which *payoff motivated* types choose the *payoff motivated* option if they believe that all three other group member also choose the *payoff motivated* option.

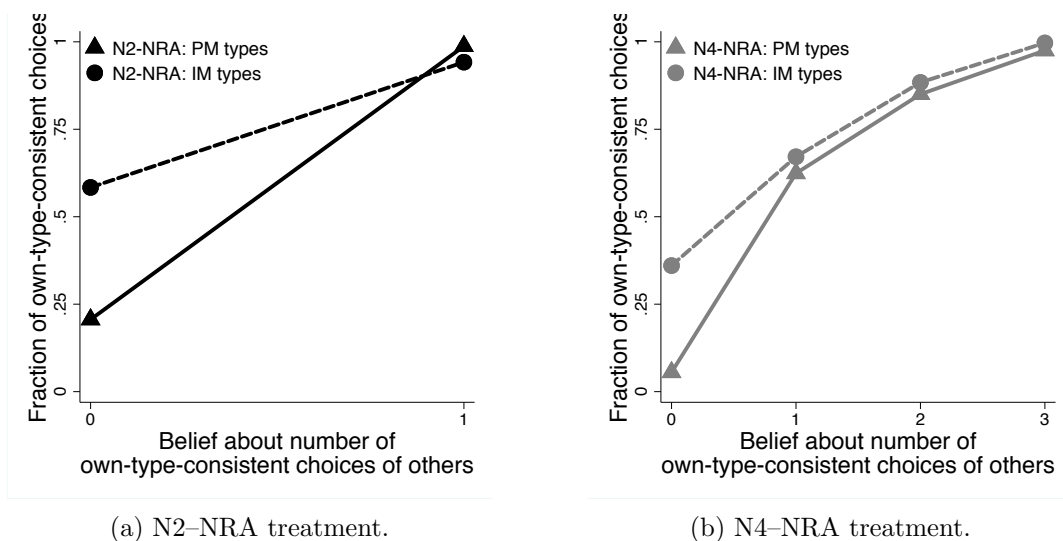


Figure 4: Relationship between beliefs and choices.

Overall, subjects' choices are clearly correlated with their beliefs: In both treatments, subjects of both types are significantly more likely to choose the option that is consistent with

²⁷A slightly different way of studying the same question *within individuals* is to test whether subjects that are classified as *payoff motivated* types are more willing to give in after facing disagreements compared to *ideologically motivated* types. A subject is defined to “give in” when switching from a choice consistent with the subject's type in the previous period—*payoff motivated* choice for *payoff motivated* types and *ideologically motivated* choice for *ideologically motivated* types—towards a choice inconsistent with the subject's type in the current period. We find that, in all treatments, *payoff motivated* types are more likely to give in than *ideologically motivated* types and the difference is always statistically significant (N2–NRA: 47% vs. 17%, $p = 0.033$; N4–NRA: 29% vs. 15%, $p < 0.001$; Clustered Pearson χ^2 tests). Switches after disagreement that constitute no such giving in do not show a significant difference (Clustered Pearson χ^2 tests, N2–NRA: $p = 0.133$, N4–NRA: $p = 0.474$). Unsurprisingly, switching rates after *agreement* are very low (below 2% in both treatments) and not significantly different between types in both treatments (Clustered Pearson χ^2 test, $p > 0.539$).

their type, the greater the number of other group members that they believe will also take that option (Spearman’s rho, $\rho \geq 0.637$, $p < 0.001$). Additionally, both types almost always choose their type-consistent option when they believe that all of the other group members choose that option and their choices in this case do not differ significantly (Clustered Pearson’s χ^2 tests, N2–NRA: $p = 0.451$, N4–NRA: $p = 0.105$). However, when subjects believe that *all other* group members choose the option that is inconsistent with their type, *ideologically motivated* types are more likely to still choose their type-consistent option compared to *payoff motivated* types (N2–NRA: 58% vs 21%; N4–NRA: 36% vs 6%). The difference is statistically significant in treatment N4–NRA, but, despite a large effect size and potentially because of the much smaller sample size, not in the treatment N2–NRA (Clustered Pearson’s χ^2 tests, N4–NRA: $p < 0.001$, N2–NRA: $p = 0.133$). We summarize the findings from these analyses in the following result:

Result 2. *Compared to payoff motivated types, ideologically motivated types are significantly more committed to their preferred choice i) after initial disagreement and ii) when they believe that all other group members will choose differently.*

The result provides an explanation for the difference in choice trends that we identified earlier. Disagreements induce *payoff motivated* types to give in whereas *ideologically motivated* types remain steadfast. In the following, we study how the individual decisions translate into group outcomes and whether group characteristics can, through their effect on disagreement rates, in turn, influence individual behavior.

4.2 Part II – Group level outcomes

We start our analysis of group outcomes in Part II by describing their frequency—unconditionally and conditional on reaching an agreement. Later, we use the fraction of *ideologically motivated* types in a group to test whether we can identify ideological dominance in group outcomes.

4.2.1 Aggregate agreement outcomes

Figure 5 depicts the fractions of the three possible outcomes over the 20 periods of Part II and Table A.3 in Appendix A.2 provides the corresponding averages over all periods and the four 5-period bins including non-parametric tests of treatment differences.

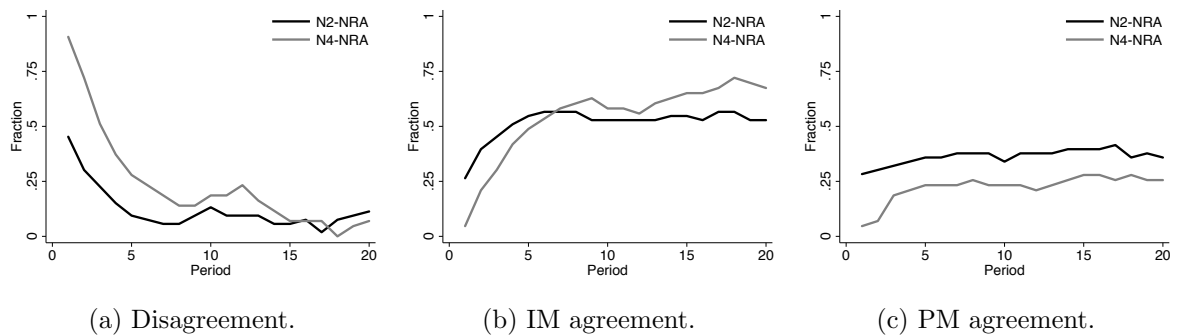


Figure 5: Rates of aggregate outcomes in Part II.

In both treatments, we observe several common patterns: First, while many groups disagree initially, disagreement rates fall quickly and significantly over time as more groups agree on an

outcome (Spearman’s rho, N2–NRA: $\rho = -0.189$, $p < 0.001$; N4–NRA: $\rho = -0.438$; $p < 0.001$). Once reached, agreements are very stable and the probability of a subsequent disagreement is below 3.4% in both treatments. Second, concurrent with the decrease in disagreement rates, we observe a strong and significant increase of *ideologically motivated* agreements (Spearman’s rho, N2–NRA: $\rho = 0.078$, $p = 0.011$; N4–NRA: $\rho = 0.2853$, $p < 0.001$). Third, and importantly, despite starting at levels comparable to *ideologically motivated* agreements, the increase in *payoff motivated* agreements over time is much weaker (Spearman’s rho, N2–NRA: $\rho = 0.047$, $p = 0.128$; N4–NRA: $\rho = 0.105$, $p = 0.002$). In fact, after a small initial increase in the first five periods, the fraction of *payoff motivated* agreements stabilizes at treatment-specific levels and does not change much until the end of Part II. Table 4 reports the corresponding parametric regression results and Result 3 summarizes these patterns.

Result 3. *In both treatments, disagreement rates decrease over time. The decrease mostly stems from additional agreements on the ideologically motivated outcome. Agreements on the payoff motivated outcome happen mostly immediately with no comparable subsequent increase.*

Table 4: Group outcomes in Part II

Dependent variable:	Disagreement		IM agreement		PM agreement	
	(1)	(2)	(3)	(4)	(5)	(6)
N2–NRA	0.233***	-0.195	0.445***	0.686	0.322***	0.509
(constant)	(0.046)	(0.380)	(0.060)	(0.770)	(0.063)	(0.777)
N4–NRA	0.340***	0.343***	-0.152*	-0.158**	-0.178**	-0.191**
	(0.072)	(0.074)	(0.081)	(0.084)	(0.078)	(0.082)
Period	-0.011***	-0.011***	0.007***	0.007***	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
N4–NRA \times Period	-0.022***	-0.022***	0.018***	0.018***	0.004	0.004
	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)
Controls	NO	YES	NO	YES	NO	YES
Observations	1920	1920	1920	1920	1920	1920
Clusters	96	96	96	96	96	96
Overall R^2	0.146	0.163	0.040	0.248	0.028	0.264

Notes: Random effects GLS regressions with group random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The panels of Figure 5 also reveal treatment differences in the initial rates and the dynamics of the outcomes. First, initial disagreement rates are significantly lower in small compared to large groups (45% vs 91%; Pearson χ^2 tests, $p < 0.001$). This is not surprising as it is more likely that the one other group member in treatment N2–NRA initially agrees on which outcome to implement compared to the three other group members in treatment N4–NRA. However, over time, disagreement rates fall significantly faster in treatment N4–NRA (see coefficient “N4–NRA \times Period” in columns (1) and (2) of Table 4) and, in the last five periods, groups of four reach insignificantly different disagreement rates below 8% (Wilcoxon ranksum test, $p = 0.641$). Corresponding to the difference in initial disagreement rates, *payoff motivated* and *ideologically motivated* agreements are initially significantly less frequent in large groups (Pearson χ^2 tests, $p \leq 0.004$). Over time, the increase in *ideologically motivated* agreements is significantly stronger

in large compared to small groups (see coefficient “N4–NRA \times Period” in columns (3) and (4) of Table 4). Therefore, rates of *ideologically motivated* agreements in large groups catch up with and overcome that in treatment N2–NRA by 14 percentage points in the last five periods. In stark contrast, the trend in *payoff motivated* agreement rates does not differ significantly across treatments and hence the rate in large groups never catches up with that in small groups (see coefficient “N4–NRA \times Period” in columns (5) and (6) of Table 4).

Result 4. *Groups in treatment N4–NRA are significantly more likely to disagree initially than groups in treatment N2–NRA. The increase in ideologically motivated agreements over time is significantly stronger in large groups, whereas there is no significant difference in the trend of payoff motivated agreements.*

The results suggest that the ratio of *ideologically motivated* to *payoff motivated* outcomes is higher in large groups. However, the interpretation of any treatment differences in absolute agreement outcomes is confounded by the underlying differences in disagreement rates. Therefore, we next discuss differences in agreement outcomes conditional on reaching an agreement. Conditional on reaching an agreement and averaged over all periods, we find that groups in treatment N2–NRA agree on the *payoff motivated* outcome in 40% of their agreements, whereas groups in treatment N4–NRA only do so in 27% of their agreements.²⁸ Thus, the chance of a *payoff motivated* agreement is about 50% higher in small groups compared to large groups. However, the difference does not reach statistical significance (Wilcoxon ranksum tests, $p = 0.176$). Table 5 regresses treatment dummies on the occurrence of a *payoff motivated* agreement conditional on reaching an agreement and also show no statistical significance (see columns (1) and (2)).²⁹

4.2.2 The effect of disagreements on group outcomes

Results 3 and 4 directly relate to our findings on individual decisions. *Ideologically motivated* types tend to be ideologically committed and less likely to back down when facing disagreements compared to *payoff motivated* types. Larger groups are more likely to disagree initially and thus more often allow the *ideologically motivated* types to “convince” their group members and shape the group outcome. In the following, we test whether initial disagreements indeed foster subsequent agreements on the *ideologically motivated* outcome. Figure 6 shows the fraction of groups that, conditional on agreeing, agree on the *payoff motivated* outcome depending on whether an agreement was reached in the first period, or not.

In both treatments, groups are about half as likely to agree on the *payoff motivated* outcome after an initial disagreement compared to when they agreed initially (N2–NRA: 51.7% vs 26.5 %; N4–NRA: 50.0% vs 25.2%). The difference is significant in treatment N2–NRA, but, potentially due to the very low number of groups that agree initially, not in treatment N4–NRA

²⁸To calculate these averages, we first take, for each group, an average over all the periods in which that group agreed successfully. Then, we take treatment averages over the groups that agreed at least once. Thus, the overall averages reflect which outcomes groups agree on when they agree and are not biased by the frequency with which they agree.

²⁹Since we condition our analysis on reaching an agreement, the results in this section could be confounded by a selection effect if the groups that reach an agreement are different from those that never agree. However, in treatments N2–NRA and N4–NRA all groups at some point agree.

Table 5: Group outcome conditional on a successful agreement

Dependent variable: PM agreement	(1)	(2)	(3)	(4)
N2-NRA	0.403***	0.471	0.517***	0.581
(constant)	(0.067)	(0.837)	(0.088)	(0.798)
N4-NRA	-0.128	-0.134	-0.014	-0.018
	(0.095)	(0.094)	(0.103)	(0.093)
Initial disagreement			-0.251**	-0.283***
			(0.115)	(0.099)
Controls	NO	YES	NO	YES
Observations	1590	1590	1590	1590
Clusters	96	96	96	96
Overall R^2	0.015	0.312	0.068	0.376

Notes: Random effects GLS regressions with group random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

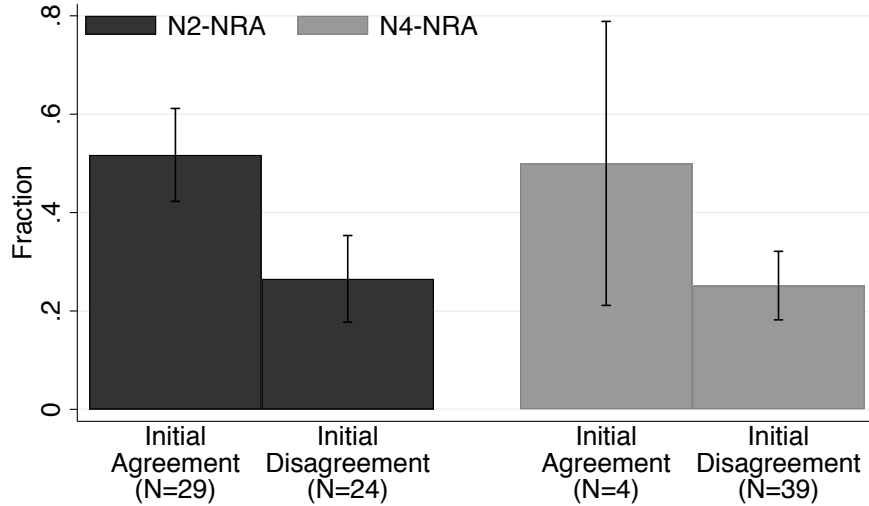


Figure 6: Agreements on the PM outcome after initial agreement or disagreement.

(Fisher’s exact test, $p = 0.037$ and $p = 0.344$).³⁰ Parametric regressions confirm this finding (see coefficient “Initial disagreement” in columns (3) and (4) of Table 5). Furthermore, when accounting for the rate of initial disagreements in the regression, the coefficients for treatment N4-NRA is almost zero and far from being statistically significant. Relatedly, conditional on agreeing or disagreeing initially, there are no significant treatment differences in the fraction of *payoff motivated* agreements (Fisher’s exact test, $p = 1.000$ and $p = 0.701$, respectively). This yields the next result:

Result 5. *Groups that disagree initially are (significantly) more likely to agree on the ideologically motivated outcome compared to groups that agree initially. Large groups initially disagree*

³⁰Pooling the data from both treatments also yields a significant effect (Fisher’s exact test, $p = 0.014$). We are using the Fisher’s exact test instead of the clustered Pearson χ^2 test to account for the low number of observations of large groups that agree initially.

more often than small groups and, therefore, agree more often on the ideologically motivated outcome.

4.2.3 Group composition effects and ideological dominance

Finally, we study how different group compositions leverage the type-based differences in reactions to disagreements to implement different outcomes. As a measure of group composition, we use the fraction of *ideologically motivated* types in a group.³¹ Table 6 summarizes the distribution of group compositions in the two treatments.

Table 6: Frequency of different group compositions per treatment

	Fraction of IM type				
	0	0.25	0.5	0.75	1
N2-NRA	12	-	26	-	15
N4-NRA	1	7	22	12	1

Figure 7(a) and the left column of Table A.7 in Appendix A.2 present the fraction of successful agreements depending on treatment and group composition. Not surprisingly, homogeneous groups are more likely to agree than heterogeneous groups. Small groups are more often homogeneous and hence agree more often on an outcome. This explains the difference in initial agreement rates between treatments N2-NRA and N4-NRA and the subsequent difference in individual decisions and outcomes (Results 1-4).

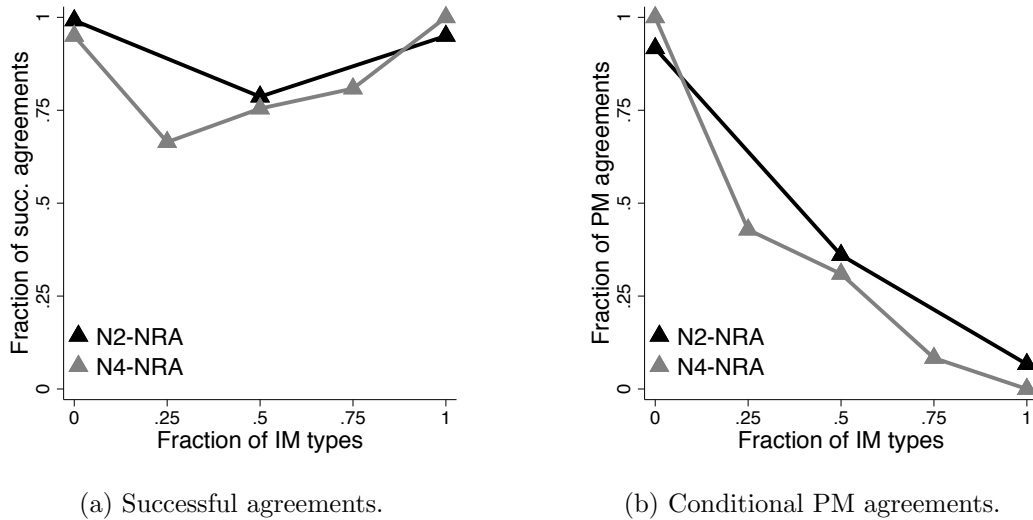


Figure 7: Influence of the fraction of *ideologically motivated* types in a group.

Figure 7(b) and the right column of Table A.7 in Appendix A.2 present the fraction of *payoff motivated* agreements conditional on reaching an agreement. Clearly, the propensity of agreeing on the *payoff motivated* outcome significantly decreases with a rising fraction of *ideologically motivated* types in a group (Spearman's rho, N2-NRA: $\rho = -0.614$, $p < 0.001$; N4-NRA:

³¹Our random assignment of individuals to groups and our independent type-classification ensure that the group composition is exogenously and randomly determined, and does, thus, not suffer from endogeneity problems like selection effects, etc. However, the distribution of group compositions differs on the tails as there is a large number of homogeneous groups in small but not in large groups. This and the fact that certain group compositions are not observed in N2-NRA provides a challenge for meaningful statistical analyses.

$\rho = -0.345$; $p = 0.023$). The agreements of homogeneous groups are very type-consistent—almost all such groups agree on the outcome that coincides with the group members’ type. In heterogeneous groups, *ideologically motivated* types have a disproportionately large influence on the outcome of an agreement. If only one out of four group members is an *ideologically motivated* type, groups agree on the *ideologically motivated* outcome in 57% of all agreements. On the other hand, if one out of four group members is a *payoff motivated* type, those groups agree on the *payoff motivated* outcome in only 8% of all agreements. When half of the group consists of *ideologically motivated* types, the *ideologically motivated* outcome is implemented in 64% and 69% in treatments N2–NRA and N4–NRA, respectively. These fractions are significantly greater than 50% when pooling the data from both treatments (Wilcoxon signrank test, $p = 0.012$).

Result 6. *Ideologically motivated types have a disproportionately large effect on the outcome compared to payoff motivated types.*

Result 6 provides evidence of *ideological dominance*. Ideological dominance arises when heterogeneous groups give committed *ideologically motivated* types the chance to influence the group outcome. Since large groups are more often heterogeneous and hence initially disagree more often, ideological dominance can evolve more easily in larger groups.

5 Additional treatment: Ideologically aligned outcome

The treatments studied thus far show that the presence of *ideologically motivated* group members can, through their “ideological commitment”, impact group decision making processes and lead to “ideological dominance” in group outcomes. In addition, they show that the effects can be stronger in larger groups. However, so far, we only studied situations in which the *ideologically motivated* agreement prevents the implementation of externalities that are in conflict with the types’ ideology. In many circumstances, however, an *ideologically motivated* outcome is preferred because it actively supports ones ideological goals and it is an interesting open question whether individual behavior and group outcomes in such situations are affected in the same way as in our initial treatments. To answer this question, we conducted an additional treatment. In this treatment, while holding everything else constant, implementing the *payoff motivated* outcome produces no externality, but implementing the *ideologically motivated* outcome yields a donation to an organization that is ideologically aligned with the *ideologically motivated* types.³² In the following, we briefly describe the experimental design and the pertaining results.

³²Conducting this treatment yields two additional benefits. First, while we believe that our monetary incentives are strong enough such that subjects’ choices truly reveal their preferences, one could be concerned that, instead, experimenter demand effects could have influenced the choices in the previous treatments. In the new treatment, the framing with which the donation is introduced is identical but the externality produced is “positive” instead of “negative”. Thus, if our results in this new treatment differ from the previous results, it would indicate that the latter are not driven by experimenter demand effects. A second additional benefit of generating donations for two organizations with opposing political goals is that the externalities produced by our study as a whole are politically neutral. The additional treatment received prior approval from the IRB board of the Faculty of Management, Economics, and Social Sciences of the University of Cologne.

5.1 Design and Procedures

The new treatment (called “N4–ET”) mirrors the treatment N4–NRA with four group members in Part II. The subjects’ choice options in Part I and Part II, and those choices’ payoff consequences for the subjects are identical to treatment N4–NRA. However, treatment N4–ET differs in one respect. The donation that is generated does not go to the NRA, but to the organization “Everytown For Gun Safety”. Everytown is an influential US gun control advocacy organizations. It fights against the unrestricted right of all US citizens to acquire, own, carry, share and use firearms. As of 2019, Everytown had approximately 5 million members in the US. In Part I, choosing Option 0 to 10 results in a donation of 0 to 10 Euro to Everytown. In Part II, a donation of 8 Euro is generated whenever all choose the *ideologically motivated* option. Otherwise, no donation is generated. Thus, there again exists a trade-off between a *payoff motivated* agreement and an *ideologically motivated* agreement.

172 subjects across seven sessions participated in treatment N4–ET in July 2019, yielding 43 independent observations (i.e., groups). Participants were recruited in the same way and from the same subject pool as before. However, subjects that participated in an earlier treatment were not invited. Again, donations were implemented after the sessions and participants could sign up to receive a confirmatory receipt.

5.2 Results

In the following, we present the results of treatment N4–ET in comparison to treatment N4–NRA. We summarize the results in the same order as before.

5.2.1 Part I – Type classification

Figure A.5 shows the fraction of subjects’ choices for each of the eleven options in Part I. 40.70% of subjects choose the payoff-maximizing option and 50.0% sacrifice money to increase the donation to Everytown. Interestingly, 9.30% of subjects were willing to give up money to reduce the donation to Everytown.³³

As before, we classify subjects as *ideologically motivated* types, if they are willing to sacrifice the maximum amount of money to further their *ideologically motivated* goals—in this case, a positive donation to Everytown. 14.53% (25 out of 172) of subjects choose Option 10 and are, hence, classified as *ideologically motivated*. The other 85.47% (147 out of 172) of subjects are classified as *payoff motivated*. Thus, we already observe in Part I that subjects from the same subject pool are, on average, less willing to give up own money in order to support a charity that is positively aligned with their ideology than to prevent a donation to a charity in conflict with their ideology. The difference in proportion of *ideologically motivated* types between treatments N4–NRA and N4–ET is statistically significant (Chi-squared test, $p < 0.001$).

5.2.2 Part II – Individual decisions

Figure 8 shows the fraction of subjects who choose the *payoff motivated* option for all subjects and by type. Table A.16 in Appendix A.3 reports the respective average choices in all periods

³³See Figure A.5 in Appendix A.3 for the full distribution of choices.

and the four five-period bins, and presents p-values of the respective treatment comparisons.

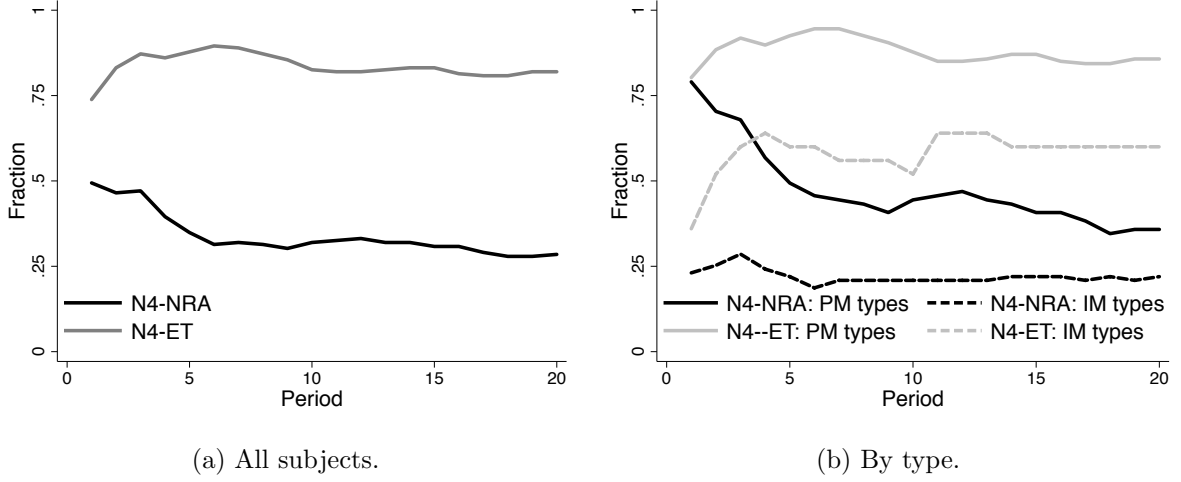


Figure 8: Treatment N4-ET: Fraction of *payoff motivated* choices in Part II.

Table 7: Treatment N4-ET: Individual choices in Part II

Dependent variable:	All subjects		IM types		PM types	
PM choice	(1)	(2)	(3)	(4)	(5)	(6)
N4-NRA	0.432***	0.549***	0.236***	1.105***	0.653***	0.472***
(constant)	(0.048)	(0.167)	(0.043)	(0.349)	(0.054)	(0.181)
N4-ET	0.422***	0.385***	0.296***	0.300***	0.256***	0.253***
	(0.057)	(0.063)	(0.104)	(0.102)	(0.062)	(0.066)
Period	-0.009***	-0.009***	-0.002	-0.002	-0.017***	-0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
N4-ET \times Period	0.007*	0.007*	0.006	0.006	0.014***	0.014***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Period + N4-ET \times Period = 0	0.519	0.520	0.184	0.185	0.339	0.340
Controls	NO	YES	NO	YES	NO	YES
Observations	6880	6880	2320	2320	4560	4560
Clusters	86	86	63	63	85	85
Overall R^2	0.260	0.307	0.107	0.215	0.211	0.243

Notes: Random effects GLS regressions with individual random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). The row “Period + N4-ET \times Period = 0” reports p-values from Wald tests. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Subjects in treatment N4-ET are significantly more likely to choose the *payoff motivated* option initially compared to treatment N4-NRA (Pearson χ^2 tests, $p < 0.001$). Furthermore, due to divergent trends, this difference grows over time and subjects in treatment N4-ET are significantly more likely to choose the *payoff motivated* option in all five-period bins (Clustered Pearson χ^2 tests, $p \leq 0.001$). Columns (1) and (2) of Table 7 provide parametric regression results.

When looking at the behavior of *payoff motivated* and *ideologically motivated* types separately, we still observe that *payoff motivated* types are more likely to choose the *payoff motivated* option in treatment N4-ET, but the difference shrinks over time and is only marginally signif-

icant in the second half of Part II (Clustered Pearson χ^2 tests, periods 1-5 & 6-10: $p < 0.001$, periods 11-15 & 16-20: $p \leq 0.097$). Additionally, we observe a different dynamic pattern in treatment N4-ET compared to treatments N2-NRA and N4-NRA. In both NRA treatments, the fraction of *ideologically motivated* types who choose the *payoff motivated* option remained constant, while the respective fraction of *payoff motivated* types decreased strongly. In treatment N4-ET, on the other hand, *payoff motivated* types' choice of the *payoff motivated* option starts at similar levels, but remains high ($> 85\%$) and constant over all periods, whereas *ideologically motivated* types' choice of the *payoff motivated* option *increases* initially and then also remains constant (between 50% and 60%). Statistically, there is no significant trend for both types in treatment N4-NRA (see row "Period + N4-ET \times Period=0" of Table 7, which provides p-values of Wald tests). Therefore, compared to treatment N4-NRA, both types of subjects in treatment N4-ET choose the *payoff motivated* option significantly more often in all 5-period bins (Clustered Pearson χ^2 tests, $p \leq 0.002$). We summarize these findings in the following result:

Result 7. *Both Payoff motivated and ideologically motivated types are significantly more likely to choose the payoff motivated option when the externality is aligned with the ideologically motivated type's ideology compared to when it is in conflict with it. Furthermore, over time, the fraction of subjects who choose the payoff motivated option shows no trend for both types in treatment N4-ET, while we observed a decreasing trend for payoff motivated types in treatment N4-NRA.*

Result 7 demonstrates that individuals behave differently when the *ideologically motivated* option prevents an ideological averse outcome (N4-NRA) compared to when it implements an ideologically aligned outcome (N4-ET). In the following, we study whether these results are driven by a difference in terms of ideological commitment between the two treatments.

First, we again study the choices of the two types after initial disagreement or agreement. *Ideologically motivated* types are significantly less likely to choose the *payoff motivated* option after an initial disagreement compared to *payoff motivated* types (52.5 % vs 82.5%, Clustered Pearson χ^2 test, $p = 0.024$). However, due to the low number of observations of IM types and the fact that all initial agreements are all on the *payoff motivated* outcome, it is not possible to say which type compromises more after initial disagreements (see Figure A.6 in Appendix A.3). Across treatments, we find that both types are significantly more likely to choose the *payoff motivated* option after initial disagreement in treatment N4-ET compared to treatment N4-NRA (Clustered Pearson χ^2 tests, $p < 0.006$)).

When we study which type is more willing to give in after having faced disagreement in the previous period, we find that, in treatment N4-ET, *ideologically motivated* types are significantly more likely to give in than *payoff motivated* types (N4-ET: 41% vs. 7%, Clustered Pearson χ^2 test, $p = 0.010$), the opposite of what we found in treatment N4-NRA (see footnote 20 on page 15).

Finally, we study how the subjects' choices are influenced by their beliefs about the behavior of their group members.³⁴ As before, subjects of both types are significantly more likely to choose the option that is consistent with their type the greater is the number of other group

³⁴Figure A.7 in Appendix A.3 shows the fraction of subjects' choices that are consistent with their type,

members that they believe will also take that option (Spearman’s rho, $\rho = 0.619$, $p < 0.001$). We also again observe that *ideologically motivated* types tend to be more likely to stick to their own-type-consistent choices than *payoff motivated* types, independent of their beliefs, however, none of the differences is statistically significant (Clustered Pearson’s χ^2 tests, $p \geq 0.159$). Thus, overall, we don’t find convincing evidence for ideological commitment in treatment N4–ET.

Result 8. *Individual ideological commitment is strong when the ideologically motivated agreement prevents an externality in conflict with the ideology but weak when it implements an externality aligned with the ideology.*

5.2.3 Part II – Group level outcomes

Next, we study how group agreement outcomes evolve in treatment N4–ET. Figure 9 depicts the fractions of the three outcomes over the 20 periods of Part II and Table A.17 in Appendix A.3 provides the corresponding averages over all periods and the four 5-period bins including non-parametric tests of treatment differences.

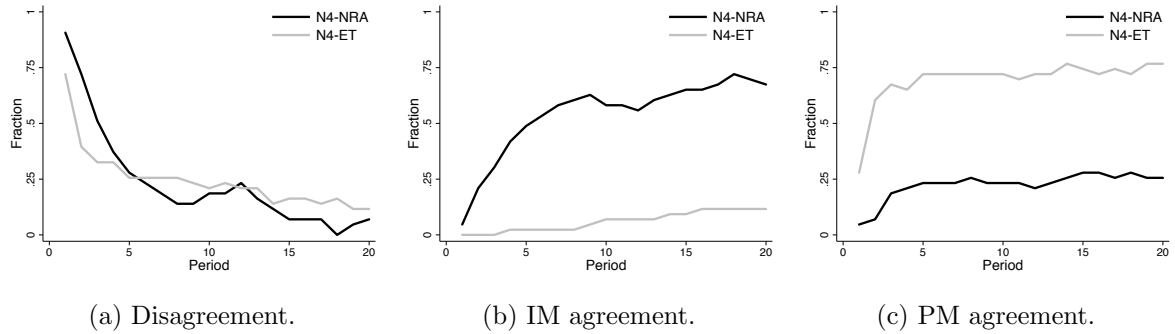


Figure 9: Treatment N4–ET: Group outcomes in Part II.

As in the other two treatments, disagreement rates in treatment N4–ET start high and fall significantly over time (Spearman’s rho, $\rho = 0.973$, $p < 0.001$). Regarding agreement outcomes, we observe a strong and significant initial increase of *payoff motivated* agreements in the first five periods, but no significant trend thereafter (Spearman’s rho, $period \leq 5$: $\rho = 0.267$, $p < 0.001$; $period > 5$: $\rho = 0.029$, $p = 0.460$). On the other hand, *ideologically motivated* agreements do not increase significantly in the first five periods, but do so (at a slow pace) thereafter (Spearman’s rho, $Period \leq 5$: $\rho = 0.103$, $p = 0.133$; $Period > 5$: $\rho = 0.125$, $p = 0.002$).

Groups in treatment N4–ET disagree significantly less in the first five periods compared to groups in treatment N4–NRA (Wilcoxon ranksum test, $p = 0.037$), but the difference loses significance after the first five-period bin (Wilcoxon ranksum tests, $p \geq 0.873$). While disagreement rates are similar, the pattern of agreement outcomes is almost reversed in treatment N4–ET compared to treatment N4–NRA. Over all periods, groups agree on the *payoff motivated* outcome significantly more often in treatment N4–ET (70% vs 22%), while they agree on the *ideologically motivated* outcome significantly less often (6% vs 54%) (Wilcoxon ranksum tests, $p < 0.001$).³⁵ The same pattern emerges, when looking at agreement outcomes *conditional*

depending on those subjects’ beliefs about how many of their group members will choose the action that is consistent with their type.

³⁵Table A.18 in Appendix A.3 presents the corresponding parametric regression results.

on reaching an agreement. When they agree, groups in treatment N4-ET agree on the *payoff motivated* outcome in 87% of their agreements, compared to only 27% in treatment N4-NRA (Wilcoxon ranksum tests, $p < 0.001$).

Result 9. *Groups agree significantly less often on the ideologically motivated outcome, when the outcome implements an externality that is aligned with the ideology compared to when it prevents an externality that is in conflict with the ideology.*

Regarding the effect of disagreements on group outcomes, we find no significant difference between groups that agree initially and those that don't (Clustered Pearson χ^2 tests, $p = 0.365$).

5.2.4 Part II – Group composition effects.

Due to the fact that only 14.53% of subjects are classified as *ideologically motivated* in treatment N4-ET, the distribution of group compositions is heavily skewed. There are 22 groups with only *payoff motivated* types, 17 groups with one *ideologically motivated* type, 4 groups with a 50-50 split of types, and zero groups with three or four *ideologically motivated* types.³⁶

Similar to treatment N4-NRA, in treatment N4-ET homogeneous groups are more likely to agree than heterogeneous groups. However, *ideologically motivated* types have less influence on the fraction of *payoff motivated* agreements conditional on reaching an agreement in treatment N4-ET. Adding one *ideologically motivated* type to a group of otherwise *payoff motivated* types reduces the occurrence of the *payoff motivated* agreement from 100% to 45% in treatment N4-NRA, but only from 95% to 81% in treatment N4-ET. The treatment difference for groups with one *ideologically motivated* type is marginally significant (Wilcoxon ranksum test, $p = 0.063$).

Result 10. *Ideologically motivated types have less influence on the occurrence of the ideologically motivated agreement when the ideologically motivated outcome implements an externality that is aligned with the ideology compared to when it prevents an externality that is in conflict with the ideology.*

Thus, overall, we don't find evidence for *ideological dominance* in treatment N4-ET.

6 Implications for our understanding of ideological preferences

With these results in hand, we can now compare them to the predictions developed in Section 3. Standard preferences of pure monetary self-interest predict that all subjects are equally likely to choose the *payoff motivated* option and that the fraction of subjects who do so does not differ depending on the group size (Prediction 1). This is clearly contrary to our findings and we can therefore conclude that our subjects are not all motivated by pure monetary self-interest.

As a first alternative, we considered that some subjects have fixed ideological preferences and pay, independent of the group size, some psychological costs when the *ideologically motivated* outcome is not implemented. With such *ideologically motivated* types in the population, only groups consisting of only *payoff motivated* types would still agree on the *payoff motivated*

³⁶Table A.19, Table A.20 and Figure A.8 in Appendix A.3 summarize the distribution of group compositions and the respective outcomes conditional on the group composition in treatment N4-ET.

outcome and all other groups on the *ideologically motivated* outcome. As it is more likely for randomly formed larger groups to contain an *ideologically motivated* type—and, thus, to agree on the *ideologically motivated* outcome—we predicted that *payoff motivated* types would be less likely to choose the *payoff motivated* option in treatment N4–NRA compared to treatment N2–NRA, but that *ideologically motivated* types would be equally likely to do so in both treatments (Prediction 2). Result 1 confirms this prediction. *Ideologically motivated* types are committed to their choices in both treatments. *Payoff motivated* types, on the other hand, act indeed as payoff-maximizers who, after realizing that a group member does not accept the *payoff motivated* outcome, prefer a low payoff to no payoff. The combination of these two behaviors leads to the evolution of *ideological dominance* in the group outcomes.

As a second alternative, we considered that subjects have malleable ideological preferences, that larger groups decrease the psychological costs of implementing the *payoff motivated* outcome, and that, therefore, *ideologically motivated* are less likely to choose the *ideologically motivated* option in treatment N4–NRA (Prediction 3). However, even though in treatment N4–NRA i) the efficiency gain of implementing the *payoff motivated* outcome is larger, ii) one can help more other group members by choosing the *payoff motivated* option, iii) responsibility is diffused among more group members, and iv) it is more likely to observe a *payoff motivated* choice by others, we don’t find evidence that *ideologically motivated* types act more often against their ideology in larger groups. Our results from treatments with varying group size are therefore consistent with fixed but not with malleable ideological preferences.³⁷

On the other hand, however, we do observe that subjects’ behavior and group outcomes in treatment N4–ET differ strongly from those in treatment N4–NRA even though the *ideologically motivated* only differs in whether it prevents or implements a negative or positive externality. First, in Part I, significantly fewer subjects are willing to sacrifice own money to donate money to Everytown than are willing to sacrifice own money to prevent a donation to the NRA. Thus, in a non-strategic setting, the benefits from implementing a positive externality seem to be smaller than the costs of implementing an equally-sized but negative externality. This indicates that, on this dimension, individuals’ ideological preferences indeed are malleable. Second, in Part II of treatment N4–ET, those subjects that are categorized as *ideologically motivated* types are more willing to give in than *payoff motivated* types—the opposite of what we found in treatment N4–NRA (Result 8). One explanation for this effect could be that, in treatment N4–ET, implementing the *payoff motivated* outcome is a Nash equilibrium even in the presence of *ideologically motivated* types. The reason for this is that the negative externality that deters *ideologically motivated* types from implementing the *payoff motivated* outcome in treatment N4–NRA is not present in treatment N4–ET. Thus, even in heterogeneous groups two Nash equilibria exist, one is preferred by *payoff motivated* types and the other by *ideologically motivated* types in a group. This might encourage *payoff motivated* types to insist on their preferred outcome and make *ideologically motivated* types more willing compromise. Overall, we conclude that *ideological commitment* and *ideological dominance* seem to be triggered when *ideologically motivated* types are given the chance to act against an organization that is in conflict with their ideology, but not when acting for an organization that is aligned with their ideology.

³⁷Of course, our variation in group size—from two to four—might have not been enough to seriously affect subjects’ ideological costs. It could be that, for much larger group sizes, ideological costs start to decrease.

7 Conclusion

In this paper, we study how groups reach agreements over the implementation of a payoff dominant, or a payoff dominated but ideologically preferred outcome. When the *ideologically motivated* outcome prevents the implementation of ideologically conflicting externality, *ideologically motivated* types are committed. Hence, even when in a minority, they tend to enforce their preferred outcome as *payoff motivated* types eventually back down. Since larger groups more often entail *ideologically motivated* types, they also feature more *ideologically motivated* outcomes. On the other hand, however, we observe that *ideologically motivated* types are much less committed to implement *ideologically motivated* outcomes when the externality is aligned with their ideology. Therefore, fewer *ideologically motivated* agreements are established in this case.

From an applied perspective, our results offer several interesting lessons. First, *ideologically motivated* types could learn that it is possible to implement ones preferred outcome even against a majority of *payoff motivated* types. *Payoff motivated* types are likely to give in once they realize that they are facing a committed type and that they are better off backing down. Second, disagreements favor the implementation of *ideologically motivated* outcomes. Hence, when designing groups, such as committees, one can manipulate the rate with which disagreements occur depending on whether more or less *payoff motivated* outcomes are the goal, e.g., by manipulating the group composition’s heterogeneity. When types are unobservable, one way to do so is to manipulate the group size, making it more or less likely that an *ideologically motivated* is in the group. When types are observable, our results suggest that, if one wants to implement the *ideologically motivated* outcome as often as possible, it is best to distribute the *ideologically motivated* types across groups. If, on the other hand, one favors the *payoff motivated* outcome, it is best to concentrate them in as few groups as possible.

We also observed that *ideologically motivated* individuals seem to be more motivated to act against an outcome that conflicts with than for an outcome that is aligned with their ideology. This finding coincides with and confirms survey evidence on political motivation. For example, in Pew Research Center (2016) the authors conclude that “far more Republicans and Democrats strongly reject the other party’s label than enthusiastically embrace their own.” Furthermore, among independents, more than half of those that lean towards a party cite harm from the opposing party’s policies as a major reason for leaning towards this party. On the other hand, only about one third of such leaners cite the positive effects from their preferred party’s policies as a major reason. This divergence could explain why populist movements often use a bogeyman (e.g., the “elite” or “immigrants”) to incite anger and action among their followers instead of referring to the positive results of their policies. Relatedly, it could also explain specific actions of ideologically motivated groups. For example, ideologically motivated newspapers could be more willing to bias reporting against a political opponent than in favor of a political proponent. Finally, although we have not studied such group compositions, it could imply that in groups that debate over an outcome that is aligned with some of the members’ ideology but in conflict with others’ ideology, the latter ones will win the argument as they are more committed.

Our results are also informative for the experimental literature on moral behavior. Many of the studies in this literature use the prevention of a “positive” externality in the form of

a donation to a positively perceived charity, such as in our treatment N4-ET, as a proxy for immoral or anti-social behavior, e.g., in the contexts of corruption (Lambsdorff and Frank, 2010; Abbink and Wu, 2017) or market externalities (Irlenbusch and Saxler, 2015; Kirchler et al., 2016; Bartling and Özdemir, 2017; Sutter et al., 2020; Falk et al., 2020). Our results show that individuals act decidedly different in individual and group settings when the negative externality is the prevention of a “good” outcome (treatment N4-ET) compared to the implementation of a “bad” outcome (treatments N2-NRA and N4-NRA).³⁸ Therefore, whether the prevention of a good outcome really is a good proxy for the situation of interest very much depends on the specific research question.

Our study presents a starting point for the investigation of the impact of ideological motives on group decision outcomes. Future research could investigate whether different ways to stir initial disagreements also leads to the same effects, how groups containing opposing ideological types behave, and whether our findings differ for other types of externalities and decision rules.

³⁸That there exists a perceptual difference between the omission of a moral and the commission of an immoral act is also established in social psychology (c.f., Spranca et al., 1991).

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A Appendix

A.1 Additional results for Part I

Table A.1: Correlations of individual characteristics with the classification as *ideologically motivated* type

	ρ	p-value
Age	-0.038	(0.531)
Female	0.128	(0.034)
Master	-0.110	(0.069)
Semester	0.004	(0.951)
Business & economics	-0.088	(0.142)
Knowledge of NRA	0.012	(0.839)
Risk	0.074	(0.217)
Patience	0.020	(0.742)
Altruism	0.346	(0.000)
Avg. trust	0.144	(0.017)
Avg. pos. reciprocity	0.123	(0.040)
Avg. neg. reciprocity	-0.012	(0.842)

Notes: The table reports Spearman's rank correlation coefficients. P-values in parentheses.

A.2 Additional results from Part II

Table A.2: Fraction of individual *payoff motivated* choices in Part II.

Treatment / Periods	All subjects					<i>Ideologically motivated</i> types					<i>Payoff motivated</i> types				
	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20
N2-NRA (n=106)	.42 (.044)	.44 (.044)	.41 (.047)	.42 (.047)	.42 (.046)	.19 (.048)	.17 (.044)	.19 (.051)	.21 (.053)	.21 (.053)	.68 (.059)	.75 (.051)	.66 (.065)	.67 (.065)	.65 (.065)
N4-NRA (n=172)	.34 (.030)	.43 (.031)	.31 (.033)	.32 (.034)	.29 (.034)	.22 (.037)	.25 (.036)	.20 (.040)	.21 (.041)	.22 (.043)	.47 (.044)	.65 (.041)	.44 (.050)	.44 (.053)	.37 (.052)
N2-NRA vs N4-NRA	.286	.902	.270	.232	.138	.742	.248	.826	.945	.990	.031	.209	.041	.040	.014

Notes: The top half shows averages over all periods and the respective 5-period bins, and, in parentheses, standard errors. The bottom half presents p-values from Pearson χ^2 tests with adjustment for group clusters.

Table A.3: Fraction of outcomes

	Disagreement					<i>Ideologically motivated</i> agreement					<i>Payoff motivated</i> agreement				
	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20
N2-NRA (N=53)	.12 (.028)	.25 (.045)	.08 (.032)	.08 (.032)	.08 (.027)	.52 (.062)	.43 (.059)	.55 (.067)	.54 (.067)	.54 (.067)	.36 (.063)	.32 (.062)	.37 (.066)	.38 (.067)	.38 (.065)
N4-NRA (N=43)	.23 (.033)	.56 (.052)	.18 (.043)	.16 (.048)	.05 (.023)	.54 (.058)	.29 (.053)	.59 (.067)	.60 (.072)	.68 (.069)	.22 (.058)	.15 (.045)	.24 (.063)	.24 (.063)	.27 (.066)
N2-NRA vs N4-NRA	.000	.000	.042	.125	.641	.644	.111	.801	.499	.140	.064	.049	.237	.160	.185

Notes: The top half shows averages over all periods and the respective 5-period bins, and, in parentheses, standard errors. The bottom half presents p-values from Wilcoxon ranksum tests. We use the fraction of periods in which a group reached the respective outcome as independent unit of observation.

Table A.4: Individual choices in Part II

Dependent variable:		All subjects			
PM choice	(1)	(2)	(3)	(4)	
N2-NRA	0.424***	0.576***	0.439***	0.591**	
(constant)	(0.061)	(0.249)	(0.057)	(0.252)	
N4-NRA	-0.084	-0.095	-0.006	-0.017	
	(0.084)	(0.076)	(0.075)	(0.068)	
Period			-0.001	-0.001	
			(0.002)	(0.002)	
N4-NRA \times Period			-0.007**	-0.007**	
			(0.003)	(0.003)	
Controls	NO	YES	NO	YES	
Observations	5.560	5.560	5.560	5.560	
Clusters	96	96	96	96	
Overall R^2	0.007	0.093	0.014	0.100	

Notes: Random effects GLS regressions with individual random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Probability of “giving in” after disagreement by type.

	N2-NRA	N4-NRA
PM type	.47 [21]	.29 [66]
IM type	.17 [22]	.15 [71]
p-value	.033	.000

Notes: Averages are calculated by first taking individual averages over all periods in which an individual faced disagreement and then taking type averages over all respective individual averages. In brackets is the number of individuals who faced the respective situation at least once. p-values are based on Pearson χ^2 tests on the underlying choice data with adjustment for group clusters.

Table A.6: Reaction to type-consistent beliefs

Belief / Type	N2-NRA		N4-NRA			
	0	1	0	1	2	3
PM type	.21 [25]	.99 [44]	.06 [59]	.62 [50]	.85 [50]	.98 [67]
IM type	.58 [32]	.94 [52]	.36 [52]	.67 [54]	.88 [53]	1.00
p-value	0.133	0.452	0.000	0.472	0.439	0.105

Notes: Averages are calculated by first taking individual averages over all periods in which an individual stated the respective belief and then taking type averages over all individual averages. Thus, the overall averages reflect how individuals react to certain beliefs and are not biased by the frequency with which they stated a belief. In brackets is the number of individuals who inserted the respective belief at least once. p-values are based on Pearson χ^2 tests on the underlying choice data with adjustment for group clusters.

Table A.7: Group composition effects on agreements and conditional outcome

Fraction	Successful agreements					Cond. PM agreement				
	0	0.25	0.5	0.75	1	0	0.25	0.5	0.75	1
N2-NRA	.99	-	.79	-	.95	.92	-	.36	-	.07
N4-NRA	.95	.66	.76	.81	1	1	.43	.31	.08	0

Notes: Averages are calculated by first taking group averages over all periods with successful agreement and then taking treatment averages over all group averages. This ensures that the overall averages reflect what groups agreed on and are not biased by how many periods they agreed on it.

A.2.1 Weaker *ideologically motivated* type classification

In the following, we check whether our results are robust to a weaker classification of *ideologically motivated* types. *Ideologically motivated* type are now all those subjects that chose to donate four Euro or less to the NRA in Part I (by choosing Option 0-4). Thus, *payoff motivated* types are all those that maximized their personal payoff in Part I by choosing Option 5 (and two subjects that chose Option 6). As in the main classification, there is no significant difference in the distribution of types between the two treatments (Chi-squared test, $p = 0.956$).

Table A.8: Weaker classification: Absolute and relative frequencies of types

	PM type	IM type
N2-NRA	33	73
(n=106)	(31.1%)	(68.9%)
N4-NRA	53	119
(n=172)	(30.8%)	(69.2%)
Total	86	192
	(30.9%)	(69.1%)

Table A.9: Weaker classification: Correlations of individual characteristics with the classification as IM type

	ρ	p-value
Age	-0.073	(0.224)
Female	0.148	(0.014)
Master	-0.046	(0.449)
Semester	-0.071	(0.238)
Business & economics	-0.083	(0.166)
Knowledge of NRA	-0.011	(0.854)
Risk	0.010	(0.868)
Patience	-0.035	(0.560)
Altruism	0.256	(0.000)
Avg. trust	0.158	(0.008)
Avg. pos. reciprocity	0.072	(0.229)
Avg. neg. reciprocity	-0.079	(0.192)

Notes: The table reports Spearman's rank correlation coefficients. P-values in parentheses.

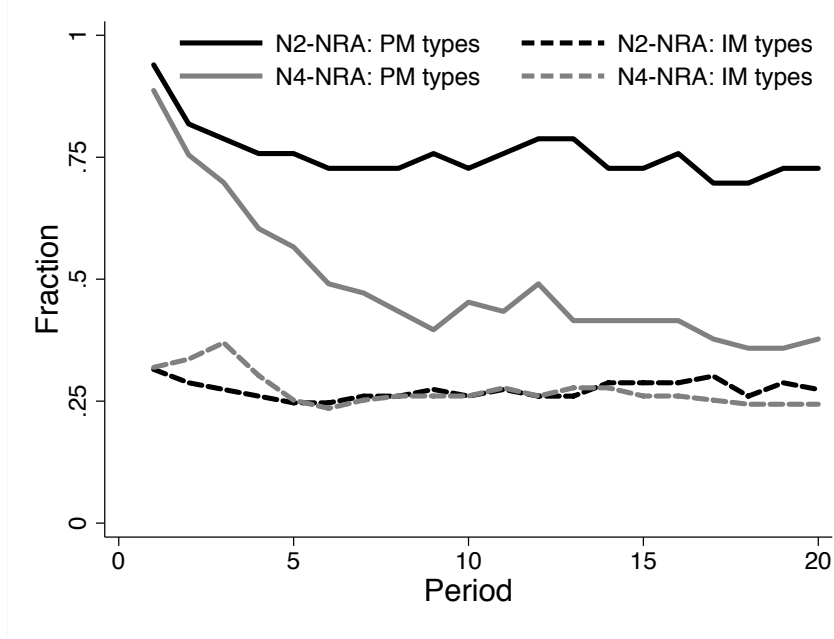


Figure A.1: Weaker classification: Individual choices in Part II by type.

Table A.10: Weaker classification: Individual choices in Part II

Treatment / Period	All subjects					Ideologically motivated types					Payoff motivated types				
	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20
N2-NRA (n=106)	.42 (.044)	.44 (.044)	.41 (.047)	.42 (.047)	.42 (.046)	.27 (.048)	.28 (.046)	.26 (.050)	.27 (.051)	.28 (.050)	.76 (.066)	.81 (.058)	.73 (.074)	.76 (.072)	.72 (.076)
N4-NRA (n=172)	.34 (.030)	.43 (.031)	.31 (.033)	.32 (.034)	.29 (.034)	.27 (.035)	.32 (.035)	.25 (.038)	.27 (.039)	.25 (.039)	.49 (.053)	.70 (.045)	.45 (.061)	.43 (.065)	.38 (.065)
N2-NRA vs N4-NRA	.286	.902	.270	.232	0.138	.990	.579	.941	.969	0.708	.014	.215	.019	.011	.009

Notes: The top half shows averages over all periods and the respective 5-period bins, and, in parentheses, standard errors. The bottom half presents p-values from Pearson χ^2 tests with adjustment for group clusters.

Table A.11: Weaker classification: Individual decision in Part II

Dependent variable PM choice	All subjects		IM types		PM types	
	(1)	(2)	(3)	(4)	(5)	(6)
N2-NRA	0.439***	0.591**	0.269***	0.379	0.814***	0.966**
(constant)	(0.057)	(0.252)	(0.056)	(0.267)	(0.064)	(0.429)
N4-NRA	-0.006	-0.017	0.042	0.055	-0.110	-0.145
	(0.075)	(0.068)	(0.073)	(0.064)	(0.084)	(0.091)
Period	-0.001	-0.001	0.000	0.000	-0.005	-0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
N4-NRA × Period	-0.007**	-0.007**	-0.004	-0.004	-0.015**	-0.015**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)
Controls	NO	YES	NO	YES	NO	YES
Observations	5.560	5.560	3.840	3.840	1.720	1.720
Clusters	96	96	90	90	62	62
Overall R^2	0.014	0.100	0.001	0.122	0.106	0.140

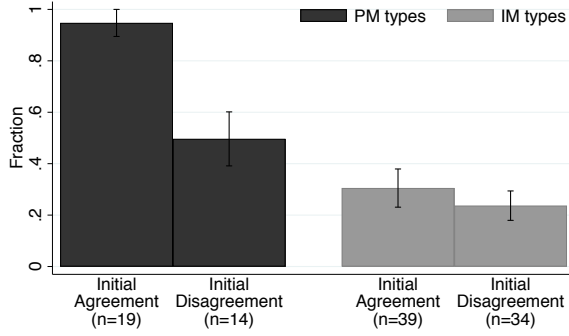
Notes: Random effects GLS regressions with individual random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of NRA), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity).

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

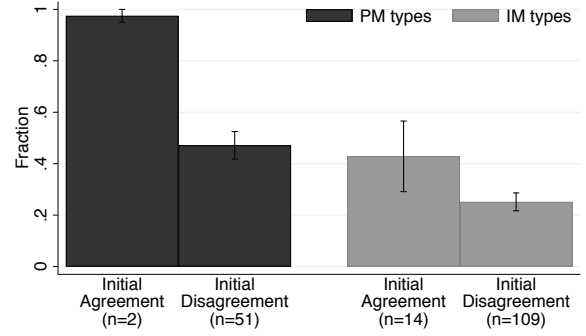
Table A.12: Weaker classification: Probability of “giving in” after disagreement by type.

	N2-NRA	N4-NRA
PM type	.43 [13]	.30 [48]
IM type	.26 [30]	.17 [89]
p-value	0.319	0.000

Notes: Averages are calculated by first taking individual averages over all periods in which an individual faced disagreement and then taking type averages over all respective individual averages. In brackets is the number of individuals who faced the respective situation at least once. p-values are based on Pearson χ^2 tests on the underlying choice data with adjustment for group clusters.

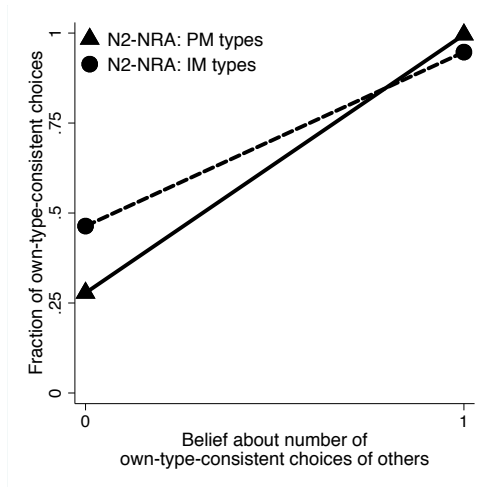


(a) N2-NRA treatment.

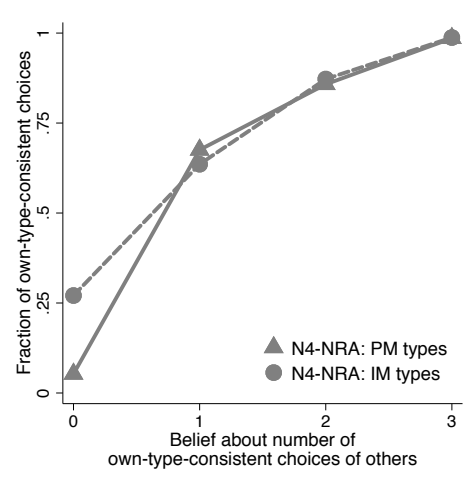


(b) N4-NRA treatment.

Figure A.2: Weaker classification: *Payoff motivated* choices by type and initial (dis)agreement.



(a) N2-NRA treatment.



(b) N4-NRA treatments.

Figure A.3: Weaker classification: Relationship between beliefs and choices.

Table A.13: Weaker classification: Reaction to type-consistent beliefs

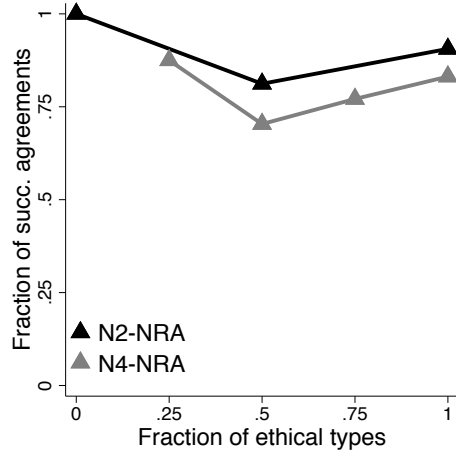
Belief / Type	N2-NRA		N4-NRA			
	0	1	0	1	2	3
PM type	.28	1	.05	.67	.86	.99
	[14]	[31]	[37]	[34]	[33]	[47]
IM type	.46	.95	.27	.64	.87	.99
	[43]	[65]	[74]	[70]	[70]	[99]
p-value	.876	.318	.061	.464	.285	.926

Notes: Averages are calculated by first taking individual averages over all periods in which an individual stated the respective belief and then taking type averages over all individual averages. Thus, the overall averages reflect how individuals react to certain beliefs and are not biased by the frequency with which they stated a belief. In brackets is the number of individuals who inserted the respective belief at least once. p-values are based on Pearson χ^2 tests on the underlying choice data with adjustment for group clusters.

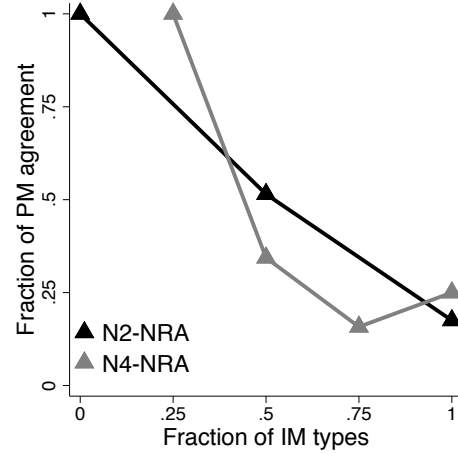
Table A.14: Weaker classification: Distribution of group composition

	Fraction of IM type				
	0	0.25	0.5	0.75	1
N2-NRA	6	-	21	-	26
N4-NRA	0	2	14	19	8

Notes: Numbers in brackets are number of groups that achieve successful coordination at least once.



(a) Successful agreements.



(b) Conditional PM agreements.

Figure A.4: Weaker classification: Influence of the fraction of IM types in a group.

Table A.15: Weaker classification: Group composition effects on agreements and conditional outcome

	Successful agreements					Cond. PM agreement				
	0	0.25	0.5	0.75	1	0	0.25	0.5	0.75	1
N2-NRA	1	-	.81	-	.91	1	-	.51	-	.18
N4-NRA	-	.88	.70	.77	.83	-	1	.34	.16	.25

Notes: Averages are calculated by first taking group averages over all periods with successful agreement and then taking treatment averages over all group averages. This ensures that the overall averages reflect what groups agreed on and are not biased by how many periods they agreed on it.

A.3 Additional results: Treatment N4-ET

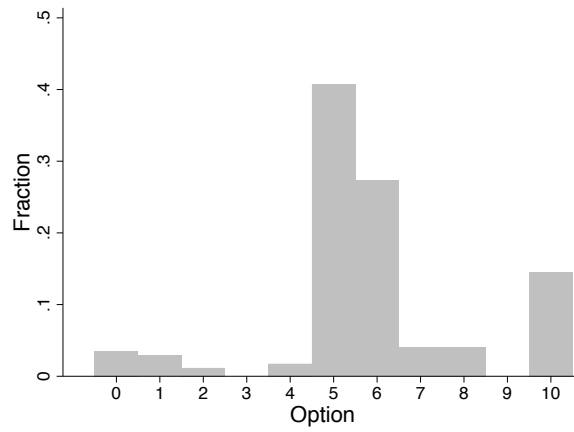


Figure A.5: Treatment N4-ET: Distribution of choices in Part I.

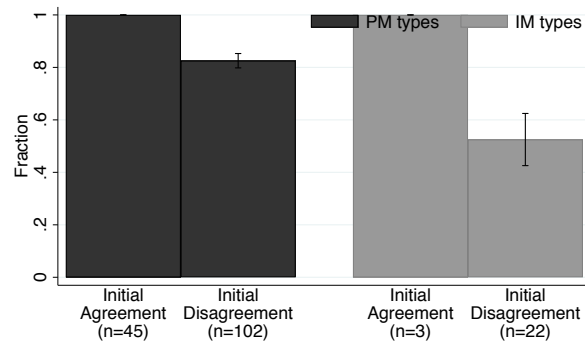


Figure A.6: Treatment N4-ET: *Payoff motivated* choices by type and initial (dis)agreement.

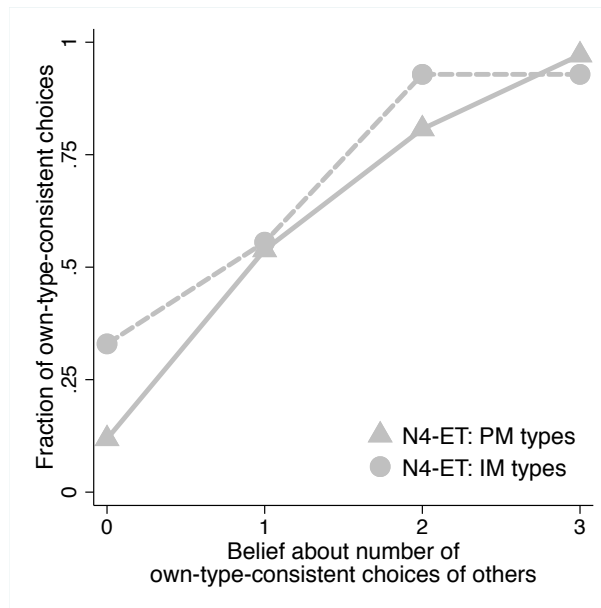


Figure A.7: Treatment N4-ET: Relationship between beliefs and choices.

Table A.16: Treatment N4-ET: Fraction of *payoff motivated* choice

	All subjects					<i>Ideologically motivated</i> types					<i>Payoff motivated</i> types				
	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20
N4-ET (n=172)	.84 (.02)	.84 (.02)	.87 (.02)	.83 (.03)	.81 (.03)	.58 (.09)	.54 (.09)	.56 (.10)	.62 (.10)	.60 (.10)	.88 (.02)	.89 (.02)	.92 (.02)	.86 (.03)	.85 (.03)
N4-ET vs N4-NRA	.000	.000	.000	.000	.000	.001	.001	.002	.000	.002	.000	.000	.000	.000	.000

Notes: The top half shows averages over all periods and the respective 5-period bins, and, in parentheses, standard errors. The bottom half presents p-values from Pearson χ^2 tests with adjustment for group clusters.

Table A.17: Treatment N4-ET: Fraction of outcomes

	Disagreement					<i>Ideologically motivated</i> agreement					<i>Payoff motivated</i> agreement				
	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20	All	1-5	6-10	11-15	16-20
N4-ET (N=43)	.24 (.05)	.40 (.06)	.24 (.06)	.19 (.06)	.14 (.05)	.06 (.03)	.01 (.01)	.04 (.03)	.08 (.04)	.12 (.05)	.70 (.06)	.59 (.06)	.72 (.07)	.73 (.07)	.74 (.06)
N4-ET vs N4-NRA	.111	.037	.873	.697	.432	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Notes: The top half shows averages over all periods and the respective 5-period bins, and, in parentheses, standard errors. The bottom half presents p-values from Wilcoxon ranksum tests. We use the fraction of periods in which a group reached the respective outcome as independent unit of observation.

Table A.18: Treatment N4-ET: Group outcomes in Part II

Dependent variable:	Disagreement		IM agreement		PM agreement	
	(1)	(2)	(3)	(4)	(5)	(6)
N4-NRA	0.573***	0.137	0.283***	0.371	0.144***	0.491
(constant)	(0.056)	(0.540)	(0.055)	(0.492)	(0.045)	(0.655)
N4-ET	-0.139	-0.028	-0.298***	-0.229**	0.437***	0.257*
	(0.088)	(0.125)	(0.058)	(0.100)	(0.078)	(0.133)
Period	-0.032***	-0.032***	0.025***	0.025***	0.008***	0.008***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)	(0.002)
N4-ET \times Period	0.014***	0.014***	-0.017***	-0.017***	0.003	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)
Controls	NO	YES	NO	YES	NO	YES
Observations	1720	1720	1720	1720	1720	1720
Clusters	86	86	86	86	86	86
Overall R^2	0.125	0.180	0.327	0.413	0.236	0.352

Notes: Random effects GLS regressions with group random effects. Robust standard errors clustered on groups in parentheses. Controls include individual characteristics (age, gender, study of economics or business, semester, prior knowledge of the organization), and individual preferences (risk aversion, altruism, trust, patience, positive and negative reciprocity). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

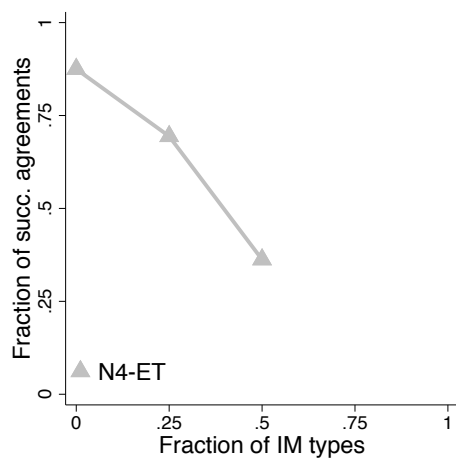
Table A.19: Treatment N4-ET: Frequency of different group compositions

	Fraction of IM type				
	0	0.25	0.5	0.75	1
N4-ET	22	17	4	0	0

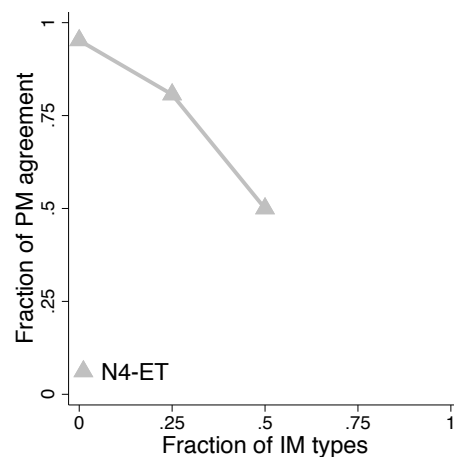
Table A.20: Treatment N4-ET: Group composition effects on group outcomes

Fraction	Successful agreements					Cond. PM agreement				
	0	0.25	0.5	0.75	1	0	0.25	0.5	0.75	1
N4-ET	.88	.69	.36	–	–	.95	.81	.5	–	–

Notes: Averages are calculated by first taking group averages over all periods with successful agreement and then taking treatment averages over all group averages. This ensures that the overall averages reflect what groups agreed on and are not biased by how many periods they agreed on it.



(a) Successful agreements.



(b) Conditional *payoff motivated* agreements.

Figure A.8: Treatment N4-ET: Influence of the fraction of *ideologically motivated* types in a group.

B Experimental instructions and decision screens

B.1 Instructions for Part I

General instructions

Welcome to this study.

Please read the first page of instructions with the general explanations on your own. The rest of the instructions will be read out aloud.

If you read the following explanations carefully, you can earn money – depending on your decisions and/or the decisions of the other participants – in addition to the **4 Euro** which you receive as a show-up fee. Therefore, it is very important that you read through these explanations carefully. If you have any questions, please raise your hand. We will then come to you and answer them.

During this study, you are not allowed to communicate with other participants or to use your mobile phone. Disregarding these rules will lead to your disqualification from the study and you won't be eligible for any payments.

At the end of today's study, you will receive from us your income earned during the study, plus 4 Euros for showing up, in **cash**.

Neither before nor after the study will you learn the identity of the other participants. Your identity will not be revealed to the other participants as well.

On the following pages, we will explain the detailed structure of the study.

The study

This study consists of two parts. At the beginning of each part you will get instructions which explain the corresponding part to you.

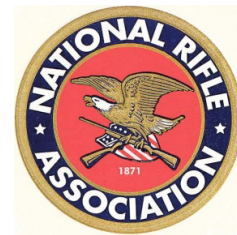
Part 1

In Part 1 you decide about a donation to the National Rifle Association (NRA).

For your information: The NRA is an influential US gun lobby association, which fights for the right of all US citizens to acquire, own, carry, share and use firearms. Therefore, the NRA rejects almost any form of legal weapon control.

The NRA has approximately 5 million members in the US.¹

The US is one of the world's leading countries for deaths by firearms.²



Your income and your donation to the NRA are determined by your choice of option 0 to 10. Depending on your choice, your income and your donation will be as follows:

Option	0	1	2	3	4	5	6	7	8	9	10
Your income (in €)	1	1,25	1,50	1,75	2	2,25	2	1,75	1,50	1,25	1
Donation to the NRA (in €)	0	1	2	3	4	5	6	7	8	9	10

After this experiment, all donations are going to be paid to the NRA. During your pay-out, you can submit your e-mail address to receive a payment confirmation.

Do you have any more questions? If so, please raise your hands. We will then come to your place. Otherwise, please answer the comprehension questions, which will soon show up on your screen.

¹ Source: https://de.wikipedia.org/wiki/National_Rifle_Association, accessed on 10/16/2016.

² Source: [http://www.amjmed.com/article/S0002-9343\(15\)01030-X/fulltext](http://www.amjmed.com/article/S0002-9343(15)01030-X/fulltext)

B.2 Decision screens for Part I

Part I

Please choose an option by clicking on it.

	Option 0	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9	Option 10
Your income (in Euro)	1.00	1.25	1.50	1.75	2.00	2.25	2.00	1.75	1.50	1.25	1.00
Donation to NRA (in Euro)	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
Your choice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

When you have made your choice, please click "Confirm".

Confirm

B.3 Instructions for Part II - “N4–NRA” treatment

Part 2

Group membership

At the beginning of this part, you are **randomly** assigned to a group consisting of **four participants**. The entire part consists of **20 rounds**. In all of the 20 rounds, you belong to the **same group**. Therefore, you will interact with the same three participants.

Decision

In each round, you and the other group members will have to make a decision. Both your own decision as well as the decision of the other participants are relevant for your income and the donation to the NRA in this round.

At the beginning of each round you choose between **option 1** and **option 2**. At the same time, all other group members also choose between **option 1** and **option 2**.

Income in one round

Whether a donation is made to the NRA and what income you earn in a round depends on which options you and the other group members have chosen. More detailed, the results in a round are determined as follows:

- If **all** group members choose **option 1**, **each** group member receives **8 Euro** and **8 Euro** are donated to the NRA.
- If **all** group members choose **option 2**, **each** group member receives **2 Euro** and **0 Euro** are donated to the NRA.
- If **not all** group members choose the **same option**, **each** group member receives **0 Euro** and **0 Euro** are donated to the NRA.

Example 1: Suppose a group consists of the participants A, B, C and D. Participants A and C choose option 1. Participants B and D choose option 2. In this case each group member will receive 0 Euro and 0 Euro are donated to the NRA.

Example 2: Suppose a group consists of the participants A, B, C and D. All participants choose option 1. In this case each group member will receive 8 Euro and 8 Euro are donated to the NRA.

Estimation of the behavior of the other group members

After you have made your decision in each round, we will ask you what you think about the decisions that were made by the other group members. You will see a screen with two input options – one for each option.

- For each of the two options, state how many of the other group members, you think, have chosen this option.
- So, you type in a 1, 2 or 3 if you think that this option was chosen by that many group members.
- You type in a 0 if you think that this option was not chosen by any group member.

If your estimation matches the actual decisions of the other group members you will receive 0,5 Euro in this round. Otherwise you will get 0 Euro.

At the end of each round you will be informed about your income and whether there was a donation to the NRA or not. Additionally, you will learn the decisions of all group members in this round. To this end, at the beginning of Part 2, each of the four group members will be randomly assigned a letter – A, B, C, or D. At the end of each round, the decisions of the group members are presented together with their assigned letter.

At the end of the study, you will be informed about your income from your estimation, right after all the decisions have been made.

Pay-out for Part 2

At the end of this study, two of the 20 rounds will be randomly and independent chosen. Your payout from part 2 and the donation to the NRA are determined by your decisions in the two chosen rounds. For one of these two rounds, your income and the donation will be implemented and paid. For the other round, your estimation will be implemented and paid. Therefore, your total payout from part 2 consists of the sum of both payouts.

Note that each of your decisions in each of the 20 rounds can be relevant. Therefore, it is important that you make your decision in each round as if this current round determines your payout.

At the end of the study, we will ask you to come forward and receive your payout including the show-up fee in cash. After the experiment, all donations will be paid to the NRA. During the payout, you can submit your e-mail address in order to receive a payment confirmation.

Do you have any more questions? If so please raise your hand. We will then come to you. Otherwise, we would ask you to answer these comprehension questions.

Comprehension questions

Part 2

1. Suppose you choose option 1.

What is your income when all the other group members also choose option 1?

What is your income when one of the other group members chooses option 2?

2. Suppose you choose option 2.

What is your income when all the other group members also choose option 2?

What is your income when one of the other group members chooses option 1?

3. What is the donation to the NRA when all the group members choose option 1?

4. What is the donation to the NRA when all the group members choose option 2?

5. What is the donation to the NRA when at least two group members decide differently?

6. Suppose you stated that you believe that three of the other group members have chosen option 1 and none have chosen option 2. In reality, one other group member chose option 2. What is your income from this estimation??

7. Are you in the same group in each round?

- ☐ YES
- ☐ NO

B.4 Decision and feedback screens for Part II

– “N4–NRA” treatment

Periode

1 von 1

Part II

As a reminder: Your choice and the choice of your group members will affect your income and the donation to the NRA.

	Your income (in Euro)	Donation to the NRA (in Euro)
Everyone chooses Option 1	8	8
Everyone chooses Option 2	2	0
Different choice	0	0

Please decide for an option

I choose: ☐ Option 1
☐ Option 2

When you have made your choice, please click "Confirm".

Confirm

Periode

1 von 1

Part II

Please indicate in the table below, according to your estimate, how many of the other members of the group, chose the corresponding option.

If you do not fill in a cell, it will be rated as if you have entered a 0.

	Estimate
Option 1	<input type="text" value="2"/>
Option 2	<input type="text" value="1"/>

When you have made your choice, please click "Confirm".

Confirm

Help

If your estimate is correct, you will receive 0.5 Euro.

Part II

Result of this round

All group members have opted for the same option in this round.
 Your income from the option choice in this round is (in Euro): 2
 The donation to the NRA in this round is (in Euro): 0

You are group member A.
 The group members decided in this round as follows :
 Group member A has decided for: Option 2
 Group member B has decided for: Option 2
 Group member C has decided for: Option 2
 Group member D has decided for: Option 2

Your income based on your estimate will only be revealed at the end of the study.

Please click on OK when you are ready.
 If you do not press "OK" within 30 seconds, you will be forwarded automatically.

OK