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Procedural Preferences, Self-Interest, and Communication. Evidence from a Laboratory Experiment

by

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Abstract

What determines individuals' preferences over alternative decision-making procedures – the potential gain from these procedures or the intrinsic value assigned to them? This study tests an income redistribution game, in which subjects can endogenously determine whether to decide upon redistribution by majority voting or to delegate the decision to a randomly selected member of the group (a "random decider"). Subjects are assigned to groups of three and receive an initial endowment, the sum of endowments being common knowledge. After a choice of the decision procedure to be applied, they can choose to either redistribute endowments equally or to maintain the original allocation. We find that the share of rational egoistic procedural choices increases when the distribution of endowments is common knowledge, compared to a situation in which subjects only know their own endowment. However, a substantive share of subjects reveals a persistent preference for majority voting, regardless of their distributional interest. Support for majority voting is strongest when common knowledge of initial endowments is combined with a chat option. These findings not only suggest that majority voting is a normative default when the rational egoistic procedural choice is limited by a lack of information, but also that support for majority voting, even where it is costly to the individual, is promoted through communication.

Keywords: procedural preferences; endogenous institutional choice; majority voting; delegation; laboratory experiment

1. Motivation

The ability of social groups to make binding decisions presupposes a certain agreement upon the legitimacy of the decision-making process among group members. Only then can it be expected that also those who suffer from the outcome of the collective decision will still accept it. Scholarly interest in "process preferences" or preferences over alternative decision-making procedures has increased in recent years (see, for example, Hibbing, 2001, Bengtsson and Wass, 2010). This is also because the depth of substantial divisions seems to have increased. In secular, highly individualized, and heterogeneous societies, a substantial consensus seems to be out of reach for most decisions. Under these conditions, a procedural consensus on the rules of decision-making in the face of intense substantial conflict becomes all the more important. The contract-theoretical tradition in institutional economics views institutions, including decision-making rules, as cooperation structures that reduce conflict. However, as authors like Terry Moe and Jack Knight have argued, no set of institutions or decision-making rules is entirely neutral when it comes to its outcome effects: every empirically conceivable procedure benefits some groups and interests more than others (Knight, 1992, Moe, 2005). Accordingly, conflict and disagreement on the substantial level may be transferred to the procedural level.

While there is evidence that expected outcome effects affect preferences over alternative decision-making procedures and the evaluation of these outcomes (Esaiasson, Persson et al., 2019, Harms and Landwehr, 2019, Harms and Landwehr 2020), we also conjecture that the effect of distributional interests on procedural preferences can be moderated by two factors: First, the outcome effects of decision-making procedures are not always transparent. Especially effects of all variants of majoritarian decision-making depend upon the prevalence and distribution of preferences and voting behavior in the collective. Secondly, individuals typically have competing sets of reasons that motivate their decisions. Besides distributional interests and instrumental reasons, ethical or normative convictions play a role. Decision-making procedures may thus be valued for reasons other than their outcome effects because they are viewed as "fair" or "democratic". Such ethical or normative convictions are likely to be activated in communication with other group members and

can potentially enable a procedural consensus even where substantial interests conflict.

To identify the role of procedural preferences in the context of redistributive conflict, we develop an experimental design that endogenizes the decision procedure. In the experiment, subjects play a redistribution game (with a linear tax rate) in which they can choose whether they want redistribution to be decided on by a majority vote or a "random decider". We distinguish three treatment conditions, one in which subjects have limited information to derive a procedural choice that maximizes their own utility (or payoff), one in which they have full information to derive such a procedural choice, and one in which full information is accompanied by communication through a chat box. The redistribution mechanism to be decided on consists in a proportional tax rate that is imposed on all incomes.[5] Previous research utilized this redistribution mechanism to study the effect of decision rules on the support for redistribution.[6] By contrast, we are interested in what determines individuals' preferences over alternative *decision-making procedures* in a situation of distributional conflict – the potential gain from a decision-making procedure or the intrinsic value assigned to it. Which decision-making procedure do rational actors prefer when they can anticipate its effect on the outcome of the impending redistributive decision?

In theoretical terms, this study contributes to the literature on procedural preferences and democratic decision-making by assessing the relevance of instrumental motives and self-interest in the formation of preferences over democratic procedures, which are typically explained only in terms of normative attitudes. In methodological terms, our study goes beyond existing research in the field by assessing behavior in a laboratory experiment where other studies rely on attitudinal survey data. With notable exceptions (e.g. Sutter, Haigner et al. 2010, Dold and

[5] The tax revenues are distributed in equal shares among all group members. Individuals with a pre-tax income below the average group income maximize their income through a tax rate of 100% (equal post-tax income). Analogously, a pre-tax income above the average leads to a preference for a tax rate of 0% (status quo). Individuals with a pre-tax income that is exactly the group average are indifferent.

[6] e.g. Esarey, Salmon and Barrilleaux, 2012; Lefgren, Sims and Stoddard, 2016; Krawczyk, 2010.

Khadjavi 2017), this is one of the few studies using a laboratory experiment to identify procedural preferences.

The paper proceeds as follows: Section 2 presents theoretical considerations on the question of why both instrumental (outcome-oriented) and intrinsic (value-oriented) reasons may be expected to play a role for procedural preferences and choices. Section 3 develops a simple formal model on procedural preferences in the context of redistributive conflict. Section 4 explains the experimental design and strategy for data analysis. Section 5 presents the empirical findings. The final section concludes and discusses the implications for further research.

2. Procedural Preferences, Self-Interest, and Communication

2.1 Determinants of Process Preferences

Economic theory views procedural choices, like all other choices, as driven by utility maximization (e.g. Acemoglu and Robinson, 2000, Robinson and Torvik, 2016): if the outcome effects of procedures can be anticipated, individuals are expected to choose the alternative that promotes their desired outcome.[7] Political science and social psychology take a different perspective on process preferences. In political science, studies of political trust and support see coherence between normative ideals of democracy and institutional reality as a central determinant for satisfaction with existing (or demand for alternative) procedures (see Norris, 2011, Ferrin and Kriesi, 2016, Landwehr and Steiner, 2017). In political psychology, Allan Lind and Tom Tyler have argued that support for judicial, but also legislative procedures depends on these procedures being regarded as "fair" by those who are to obey the decisions they produce (see Lind and Tyler, 1988, Tyler, 1994, Tyler, 2003). If procedures are viewed as fair, individuals are thus willing to accept not only procedures themselves, but also the substantial decisions they produce, even if they run counter to their own substantial preferences and material interests. Where economic theory focusses on material self-interest and *instrumental* reasons for procedural choices, political science and social

[7] Of course, if individuals' distributional interests are hidden by a "veil of uncertainty" (Buchanan and Tullock, 1962), their preferred procedure has to account for the fact that the future position in society cannot be perfectly anticipated.

psychology point out that actors attach *intrinsic* value to procedures and support them for ethical or normative reasons.

We do not think that the explanations and predictions that are respectively offered by economic theory on the one hand side and political science and social psychology on the other hand side are mutually exclusive. Empirical evidence from survey data suggests that both instrumental and intrinsic reasons may play a role where support for procedures and procedural preferences is concerned (Esaiasson, Persson et al., 2019, Harms and Landwehr, 2019 and 2020). At the individual level, however, instrumental and intrinsic reasons are likely to be to a considerable degree incommensurable, meaning that self-interest cannot easily be weighed against normative or ethical reasons. Whether an individual makes her/his self-interest or normative convictions effective in a decision will thus psychologically depend upon the accessibility and activation of respective reasons and thus on context conditions. Our experiment (described below) studies two such conditions: limited information and communication.

2.2 Procedural Preferences under Limited Information

To assess the utility derived from the choice of a specific procedure, actors require information. If we think about small groups and relatively simple procedures rather than complex electoral systems of nation-states, the relevant type of information concerns the substantial and procedural preferences of other group members. If a majority of group members is known to share one's own substantial preferences, a procedural preference for majority voting as a decision rule seems rational in the economic sense. By contrast, if a majority of members is known to reject one's own substantial preference, it might be preferable to delegate the decision to a randomly selected member of the group (a "random decider"), since there is a chance that a member of the minority will assume this role. Where the decision at hand is a redistributive one, other group members' substantial preferences over alternative options can be deduced from their position in the income distribution: if they have a *below-average* income (endowment), they will support redistribution, if they have an *above-average* income, they will reject it. Under these conditions, it is easy for group members to decide

whether their own preference constitutes a majority or minority position. Accordingly, actors can form rationally self-interested procedural preferences. Setting aside actors' ethical or normative convictions to begin with, we can formulate the following hypothesis:

H1: Under conditions of full information, actors choose the decision-making procedure that maximizes their own utility (or payoff).

The situation is different under conditions of limited information. If actors do not know the other group members' endowments, they cannot predict with certainty whether there is a majority in favor or against redistribution. Accordingly, it is much more difficult to form a rationally self-interested procedural preference, as one does not know whether one's own position is a majority or minority position. When actors are to choose a decision-making procedure under these conditions, they might either just pick one at random, or use their normative convictions as an alternative heuristic and pick the normatively most attractive one. Although we show below that in our experiment, it is still theoretically possible to calculate an expected utility for each of the alternative procedures, few people are likely to possess the mathematical skill and motivation to do so, which is why we arrive at the following second hypothesis:

H2: Under conditions of limited information, actors are less likely to choose the decision-making procedure that maximizes their utility (payoff) than under conditions of full information.

2.3 Procedural Preferences and Communication

In democratic theory, there are clear alternatives to a view according to which democracy is solely about aggregating exogenous and stable preferences. The dominant paradigm of deliberative democracy instead views preferences as endogenous to political decision-making processes and focusses on the role of deliberative communication in the formation and transformation of political preferences (see, Habermas, 1984, Dryzek, 1990, Elster, 1997 [1986]). While theories of deliberative democracy are first and foremost normative theories, their empirical

premises and predictions have also been subject to extensive testing.[8] Most importantly in this context, evidence from deliberative mini-publics shows that individuals change their substantial preferences significantly in argumentative processes (Fishkin, 2011, Niemeyer, 2011). In particular, they move their focus from their individual self-interest to the interests of the collective (Elster, 1997 [1986]). According to David Estlund, deliberation makes possible a "democracy without preference" where the input to decision-making processes consists only in judgements about the common good (Estlund, 1990). The formation and change of procedural preferences has less commonly been studied, but experiences with the British Columbia Citizens' Assembley (Warren and Pearse, 2008) and the Irish Constitutional Process (Farrell, Suiter et al., 2019) show that preference transformation and consensus-seeking are also possible when it comes to fundamental norms and rules of decision-making.

Although the causal mechanisms that allow the "forceless force of the better argument" (Habermas) to take effect at the individual level remain somewhat unclear, what Jon Elster called the "civilizing force of hypocrisy" (Elster, 1995) seems to play a central role here: if actors are forced to justify their own position with generalizable arguments in deliberative settings, this becomes easier if they accept these arguments themselves. Especially in relatively low-cost scenarios and under conditions of complexity and uncertainty, it seems cognitively more expedient to follow the categorical logic of normative arguments and to also believe in them than to attempt a rational calculation of outcome effects for each available option and to pursue a hidden agenda.

Experimental research provides robust evidence for a positive effect of communication on cooperative behavior in social dilemmas (for a review see Sally 1995, Balliet 2010). The literature offers two non-exclusive explanations for why cooperation increases if subjects are allowed to communicate before making their choice: communication may enhance group identity and/or elicit social norms of

[8] See, for example, Mutz, 2008, Niemeyer, 2011, List, Luskin et al., 2012, Baccaro, Bächtiger and Parkinson, 2019, Dryzek, Bächtiger et al., 2019.

cooperation (Bicchieri 2002: 192). Results on the existence of a ‘communication effect' in studies on electoral turnout and outcomes are more ambiguous. Kittel, Luhan and Morton (2014: F196) study how restricted communication between selected group members affects turnout when turnout is costly. They find that communication increases both turnout and the probability of strategic voting. In a follow-up study, Palfrey and Pogorelskiy (2019: 987) investigated how changes in communication structure affect both turnout and electoral outcomes. They show that communication unambiguously benefits the majority party by increasing its expected turnout margin. Although we are not aware of any previous studies testing the effect of communication on procedural choice, these findings suggest that communication may have a twofold effect as it can trigger group identity and/or social norms, but also may provide a tool for egoistic agents to form strategic alliances or to persuade and trick others.

Nonetheless, we follow ideas from democratic theory and findings in social psychology in assuming that procedural fairness and the democratic quality of decision-making procedures constitute important normative concerns, which can be activated in deliberative interaction and thus formulate the following third hypothesis:

H3: If communication is possible, actors are less likely to choose the decision-making procedure that maximizes their utility (payoff) than under conditions of full or limited information.

The kind of communication allowed in our experiment is of course far from the ideal of deliberative interaction and decision-making, but we expect the effect of communication on preferences to be linear: While only (contrafactual) ideal deliberation may suffice to blind out individual material interests altogether, less ideal forms of deliberation will still shift the focus away from these and towards the collective interest and normative considerations. Even minimal communication may thus be expected to increase the probability of non-dominant strategies to be chosen.

3. A Simple Model of Procedural Choice

3.1. Basic Structure and Assumptions

In this section, we present a simple model that allows identifying individuals' preferred decision-making procedure under the assumption of full rationality. In our empirical analysis, we will later explore to what extent this theoretical prediction is reflected by agents' actual choices.

We consider a group of *N* individuals (indexed by i), each of whom is endowed with an amount of money y_i. The *average endowment* is common knowledge and denoted by $\bar{y}$. Individuals have to decide on a tax τ on their endowments, knowing that tax revenue will be evenly distributed among all group members. For simplicity, we assume that the tax rate can be either 0 or 1 – i.e. redistribution is either absent or complete. If τ = 0, an individual keeps her endowment y_i,. By contrast, if τ = 1, her endowment is taxed away, and she receives a transfer $\bar{y}$.

We assume that all individuals prefer the tax rate that maximizes their *after-tax income* $y_i^T = (1-\tau)y_i + \tau\bar{y}$. Obviously, an individual's after-tax income is maximized by τ = 0 if $y_i > \bar{y}$, and maximized by τ = 1 if $y_i < \bar{y}$. In our experiment, groups consist of three members, i.e. N = 3, participants are randomly assigned an endowment $y_i \in \{0, \ldots, 24\}$, and they know the sum of endowments $\sum_{i=1}^{3} y_i = 24$. Moreover, they are explicitly informed about the average value $\bar{y} = 8$, which every participant receives in case of complete redistribution.

There are two procedures to determine the tax rate: in a *majority vote* (MV), all N individuals select a tax rate (either 0 or 1), and the simple majority's preferred tax rate is implemented. With a "*random decider*" (RD), a member of the group is randomly drawn and chooses her or his preferred tax rate. Obviously, the tax rate picked by the random decider need not coincide with the tax rate that would have resulted from a majority vote.

Let *p* denote the probability that a given procedure results in *complete redistribution*, i.e. that τ = 1. Since this probability depends on the decision-making procedure used, we distinguish between *p(MV)* – the probability of complete

redistribution under a majority vote – and *p(RD)*, the probability of complete redistribution in case a random decider selects the tax rate. Given that individual *i*'s goal is to maximize her *expected after-tax income*, she prefers MV over RD if the following condition is satisfied:

(1) $$\left[p(MV)-p(RD)\right]\cdot(\bar{y}-y_i)>0$$

This expression has a straightforward interpretation: if the individual's endowment is below the group average – i.e. $\bar{y}-y_i>0$ – complete redistribution (τ = 1) maximizes her after-tax income, and she prefers MV if the likelihood of complete redistribution is greater for this procedure than in case of a random decider selecting the tax rate. Conversely, if the individual's endowment is greater than the average – i.e. $\bar{y}-y_i<0$ – she prefers MV over RD if the former procedure is *less* likely to result in complete redistribution than the latter, i.e. if $p(MV)-p(RD)<0$.[9]

Of course, the probability of complete redistribution that an individual assigns to the two procedures – i.e. *p(MV)* and *p(RD)* – crucially depends on the available information. In our experiment, we distinguish between two cases: in a "full information" environment, participants know both their own endowment, the sum of endowments, and the *distribution of endowments*. In a "limited information" environment, participants only know their own endowment and the sum of endowments.

3.2. Deriving the Probability of Complete Redistribution

3.2.1. Full Information

It is easy to show that, *under full information*, the difference between the probability of complete redistribution in case of a majority vote – p(MV) – and the probability of complete redistribution if the taxation decision is taken by a random decider – p(RD) – is given by:[10]

[9] Note that the inequality in (1) is based on the assumption that agents are *risk-neutral*. If we dropped this assumption, the maximization of *expected utility* would replace the maximization of after-tax income. However, with utility increasing in (after-tax) income, this would complicate notation without affecting our key insights.

[10] For a detailed derivation, see Appendix II.

$$(2) \qquad p(MV) - p(RD) = \begin{cases} -1/3 & \text{if} \quad \sum_i \mathbf{1}_{y_i>8} = 2 \\ 0 & \text{if} \quad \sum_i \mathbf{1}_{y_i=8} \geq 1 \\ 1/3 & \text{if} \quad \sum_i \mathbf{1}_{y_i<8} = 2 \end{cases}$$

The interpretation of this expression is straightforward: if $\sum_i \mathbf{1}_{y_i>8} = 2$, i.e. if it is known that two participants have an endowment *above* the average of 8, a majority of rational agents will certainly reject complete redistribution. By contrast, there is a chance of 1/3 that the third individual (with an endowment *below* the average) will be appointed the random decider, and – assuming full rationality – this individual will implement complete redistribution. Conversely, if $\sum_i \mathbf{1}_{y_i<8} = 2$, if it is known that two participants have an endowment *below* the average, complete redistribution will certainly be picked by a majority of rational agents. However, if the RD-procedure is used, there is a chance of 1/3 that the third member (with an endowment *above* the average) will be appointed the random decider and implement a tax rate of zero. Finally, for agents who receive the average endowment of 8, the after-tax income is unaffected by the extent of redistribution, and we assume that these agents are equally likely to support τ = 1 and τ = 0. This, in turn, implies that, if $\sum_i \mathbf{1}_{y_i=8} \geq 1$, i.e. if at least one participant receives the average endowment of 8, both MV and RD are associated with the same likelihood of complete redistribution: with a majority vote, agents with the average endowment may either side with the above-average or the below-average participant. And the random decider may either prefer complete redistribution, reject it, or be indifferent, with none of the outcomes being more likely than the others.

Combining the expressions in (1) and (2), we can state that, under full information, a rational individual with an above-average endowment prefers MV over RD if there is another individual with an endowment greater than 8 in the group. Conversely, an individual with a below-average endowment prefers MV over RD if there is another individual with an endowment smaller than 8 in the group. By contrast, RD is preferred over MV if an individual is aware that she represents the minority.

Finally, if an individual has the average endowment, she is indifferent between the two procedures.

Note that our formal presentation should not mask the fact that, under complete information, individuals are likely to quickly grasp the implications of a given distribution of endowments: if a participant can identify herself as a member of a majority, MV clearly dominates RD. Conversely, if she represents a minority, RD as a procedure preserves at least a chance that the tax decision will result in an outcome that serves her interests.

3.2.2. Limited Information

If individuals know their own endowments, but are ignorant about the *distribution* of endowments in their group, it is much harder to assess whether there is a majority or a minority in favor of redistribution. In Appendix II, we demonstrate that it is possible to derive the probability of complete redistribution under the two decision-making procedures (MV or RD), and we show that

$$(3) \qquad p(MV) - p(RD) = \begin{cases} > 0 & if \quad 0 \le y_i \le 7 \\ = 0 & if \quad y_i = 8 \\ < 0 & if \quad 9 \le y_i \le 13 \\ > 0 & if \quad 14 \le y_i \le 24 \end{cases}$$

The logic behind this result is straightforward: if an individual receives a very low endowment, it is quite likely that there is another individual who finds herself in the same position, and that a majority vote will result in complete redistribution. Conversely, if an individual's endowment is very high, it is quite likely that, under MV, she will be overruled by a majority of individuals with below-average endowments. We are thus able to identify individuals' preferred procedure under the hypothesis that they want to maximize their expected after-tax income. However, computing the probabilities listed in Table A3 of Appendix II involves the solution of rather complex combinatorial problems, and it is unlikely that individuals will be able to perform these computations in the short time span they are given.[11] We therefore conjecture that, in

[11] This is the main reason why we suggest the "random decider" procedure as an alternative to a majority vote. If we had offered the toss of a coin as an alternative, the probability of complete redistribution

a situation in which it is much harder to identify one's own interest, individuals are more likely to pick a procedure that they prefer based on intrinsic motives.[12]

3.3. Endowment Distributions and Hypothetical Procedural Choices

In our experiment, we confront group members Mi (i = 1, 2, 3) with eight different distributions of endowments. These distributions are displayed in Table 1. Table 1a combines the expressions in (1) and (2) to identify the hypothetical procedural choice of an individual whose sole objective is to maximize her expected after-tax endowment under full information. We label this the "rational" choice and mark those cells for which rational members are hypothesized to pick MV in yellow and those for which rational members are hypothesized to pick RD in green. Note that, under the null hypothesis that the option to communicate does not affect rational individuals' choices, Table 1a also describes choices under the "full information + chat" treatment. Table 1b combines the expressions in (1) and (3) to identify rational procedural choices under limited information. In what follows, we test the empirical validity of the predictions summarized in Table 1a/b and test whether the available information and the option to communicate affect the validity of these predictions.

would have been 0.5, regardless of an individual's endowment. However, participants might have chosen the coin toss over the majority vote for the simple reason that it spared them the challenging computations described in Appendix II.

[12] However, this is not true if an individual receives an endowment of 18. In this case it is impossible that a majority is against redistribution. Excluding distributions that entail that one participant has an endowment of 18 does not alter any of our substantive findings.

Table 1. Participants' rational procedural choice

a) with full information

Distribution	M1	M2	M3
1	0	6	18
2	3	6	15
3	5	7	12
4	0	10	14
5	3	10	11
6	5	9	10
7	6	8	10
8	0	8	16

b) with limited information.

Distribution	M1	M2	M3
1	0	6	18
2	3	6	15
3	5	7	12
4	0	10	14
5	3	10	11
6	5	9	10
7	6	8	10
8	0	8	16

Note: Yellow = MV, Green= RD, White= Indifferent. Cell entries represent endowments. Endowments are exogenous. Under *full information*, participants know their own endowment, the sum of endowments, the average endowment, and the distribution of endowments. Under *limited information*, participants only know their own endowment, the sum of endowments, the average endowment, but *not* the distribution of endowments.

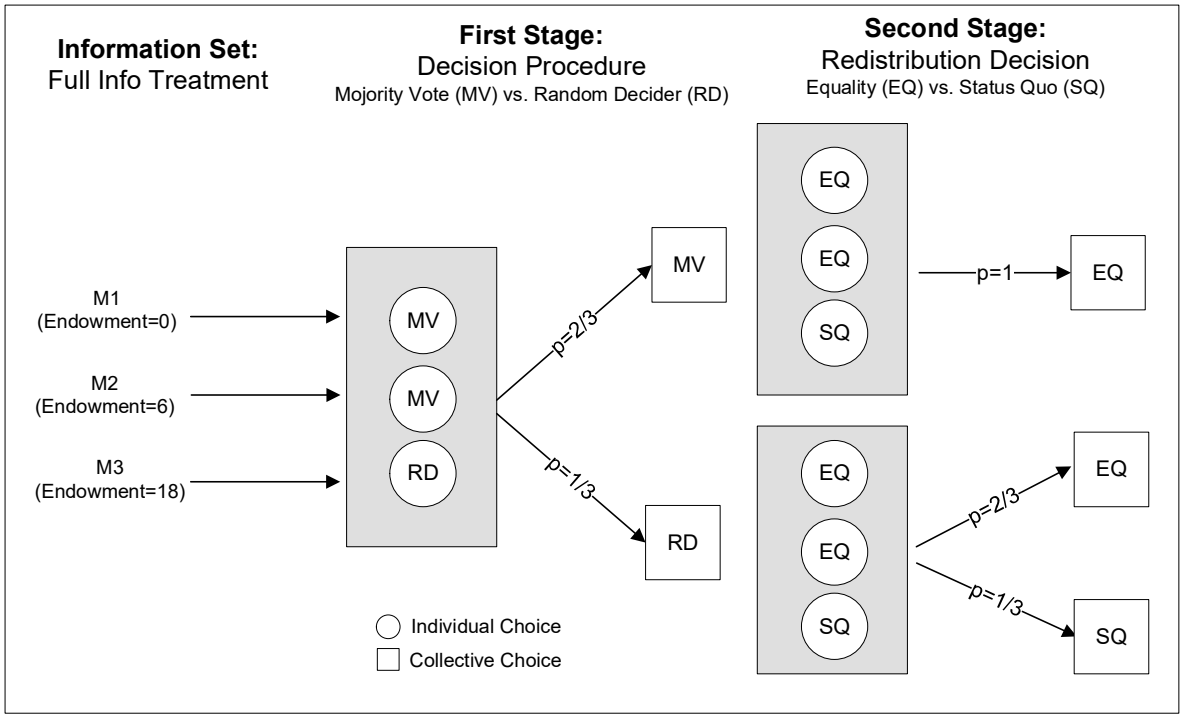
4. Methods and Data

4.1 Experimental Design

Our experimental design and individuals' rational choices are visualized in Figure 1. In the first stage, subjects choose a procedure to decide on redistribution (majority vote or random decider). The computer determines the procedure by randomly selecting the vote of one group member and making it effective. In the second stage, participants are informed about the selected procedure. Thereafter, they are asked to enter their decision on the substantial matter of implementing redistribution within the group. Subjects have a binary choice: they can either opt to maintain the status quo (SQ),

meaning that each group member keeps her or his initial endowment, or for complete redistribution, which results in equal after-tax endowments of 8 for each group member (EQ). The instructions given to participants are presented in in Appendix III and IV.

Figure 1. Experimental Procedure



Note: Refers to the first endowment distribution (see Table 1) and the full information treatment.

Each participant plays eight rounds of this two-stage experiment, with subjects randomly assigned to new groups of three in every round. At the end of the experiment, one round is randomly selected for every participant, and earnings in this round determine their payoff in Euros. All decisions are made anonymously and under full information in accordance with the paradigm of experimental economics and are accompanied by appropriate financial incentives. The experimental sessions were conducted at the *(blinded)* Laboratory at *(blinded)* University. A total of 162 subjects participated in the study (7 sessions, full information 66 subjects, full information + chat 48 subjects, limited information 48 subjects). The experiment was programmed and conducted using the laboratory experimental software zTree (Fischbacher, 2007).

Subjects are students at *(blinded)* University and were recruited using the online registration platform ORSEE. Screenshots are presented in Appendix IV.

4.2 Estimation Approach and Regression Output

The dependent variable in our regression analysis measures subjects' procedural choice in the first stage of the experiment. It takes a value of one if a participant selects the majority vote (MV) as a procedure, and a value of zero if she selects the random decider (RD). The independent variables of interest are participants' rational procedural choice, as predicted by the model introduced in Section 3, and the treatment conditions (no information, full information, limited information).

Subjects' predicted rational procedural choice is operationalized using either a categorical or a continuous approach. In the first case, we use the dummy variables *Pref-MV* and *Pref-RD* that take on the value of 1 if, based on the model presented in Section 3, a participant is expected to prefer MV or RD, respectively, and 0 otherwise – with indifference between the two procedures serving as the reference category.[13] The second approach accounts for the fact that participants' choices may not only depend on the *sign* of the expression in (1) – i.e. the question whether MV raises or reduces an individual's payoff relative to RD – but also on the *absolute magnitude* of the expected net benefit. The expected net benefit derived from MV is given by $E(\Delta y|MV)=\left[p(MV)-p(RD)\right]\cdot(\bar{y}-y_i)$.[14] We hypothesize that the probability of participants selecting MV increases as E(Δy|MV) increases.

[13] More specifically, *Pref-MV* = 1 if $\left[p(MV)-p(RD)\right]\cdot(\bar{y}-y_i)>0$, while *Pref-RD* = 1 if $\left[p(MV)-p(RD)\right]\cdot(\bar{y}-y_i)<0$, with the relevant probabilities provided by (2) and (3).

[14] Appendix II derives E(Δy | MV) for each combination of endowments and probabilities covered by the experiment.

Table 2. Determinants of Procedural Choice: Regression Results

	Model 1	**Model 2**	**Model 3**	**Model 4**
	Choice MV	**Choice MV**	**Choice MV**	**Choice MV**
Treatment (Ref. Info.)				
Limited Info (Dummy)	-0.116	0.145	-0.521*	0.156
	[0.25]	[0.23]	[0.28]	[0.23]
Full Information + Chat (Dummy)	1.300***	1.260***	1.493***	1.187***
	[0.24]	[0.24]	[0.37]	[0.24]
Rational Prediction (Ref. Indiif.)				
Pref-RD (Dummy)	-1.292***		-1.775***	
	[0.21]		[0.32]	
Pref-MV (Dummy)	0.843***		1.212***	
	[0.20]		[0.28]	
E(∆y | MV)		0.590***		0.751***
		[0.06]		[0.11]
Interaction Terms				
Pref-RD # Limited Info (Dummy)			1.414***	
			[0.48]	
Pref-RD # Info Chat (Dummy)			0.645	
			[0.50]	
Pref-MV # Info Chat (Dummy)			-0.893**	
			[0.42]	
Limited Info # E(∆y | MV)				-0.230
				[0.16]
Info Chat # E(∆y | MV)				-0.342**
				[0.15]
Controls				
Female (Dummy)	0.267	0.216	0.295	0.232
	[0.20]	[0.20]	[0.20]	[0.20]
Period (1-8)	-0.0476*	-0.0251	-0.0476	-0.0281
	[0.03]	[0.03]	[0.03]	[0.03]
Observations	1296	1296	1296	1296
AIC	1451.1	1483.1	1440.2	1479.7
BIC	1492.4	1519.2	1497.0	1526.2

Note: Binary logistic regression with random-effects, clustered by subject (N=162 x 8). The entries show estimated coefficients as well as standard errors (in brackets), *p<0.10, **p<0.05, ***p<0.01.

The treatment condition enters the regression model as a set of dummy variables ("*Limited Information*", "*Full Information + Chat*"), with the "Full Information" treatment serving as the reference category. To test whether the treatment condition affects the likelihood that participants select the procedure predicted by the theoretical model, the

empirical specification includes a set of multiplicative interaction terms. The type and number of interaction terms differs according to whether subjects' predicted procedural choice is reflected by a set of dummy variables – *Pref-MV* or *Pref-RD* – or by E(∆y|MV). Moreover, we control for subjects' gender using a *Female* dummy variable, and we include a variable *Period* that reflects the current round of the experiment (1-8 periods).[15]

Given the binary nature of the dependent variable and the panel structure of the experimental data (N=162, T=8 Periods), we use a panel logistic regression with random effects and robust standard errors. All models are estimated using Stata 15 and the *xtlogit* command. The estimated coefficients as well as diagnostic statistics are presented in Table 2.[16] In what follows, we will use predicted effect plots to visualize the estimation results using the *margins* and *marginsplot* command in Stata 15. The plots show predicted probabilities of agents choosing the majority vote as a procedure, conditional on the variable given on the horizontal axis, and averaged across all participants. The plots also give 95-percent confidence intervals for the estimated probabilities.

5. Empirical Results and Interpretation

5.1. Determinants of Procedural Choice

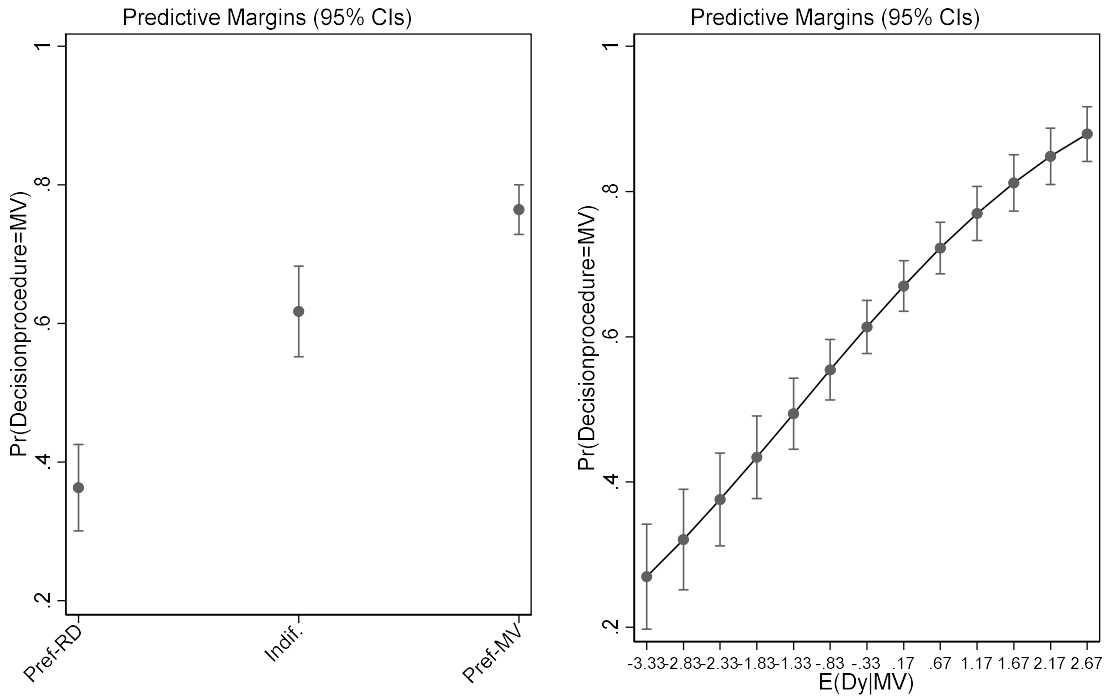
The left-hand side of Figure 2 shows the estimated probability of participants choosing the majority vote (MV), conditional on their hypothetical procedural choice – as reflected by *Pref-RD*, *Pref-MV*, or *Indifference*. This probability amounts to 75% for subjects whom we expect to prefer a majority vote. For those individuals who are expected to support RD, it is significantly lower (amounting to about 35%). While these results suggest that subjects do not behave perfectly rational when choosing the decision procedure – we would have expected the predicted probability for *Pref-RD* =

[15] Using a set of period dummies rather than the "linear trend" does not alter any of our substantive findings

[16] The inclusion of multiplicative interaction terms increases the overall model fit (see AIC, BIC). This finding is also supported by the results of two additional likelihood ratio tests, comparing M1 and M3 (LR chi2(3)=16.87, Prob>chi2= 0.001) and comparing M2 and M4 (LR chi2(2)=7.35, Prob>chi2= 0.025).

1 to be much lower – the empirical results are largely consistent with rational egoistic behavior and thus support H1.[17]

Figure 2. Direct effect of rational prediction on procedural choice

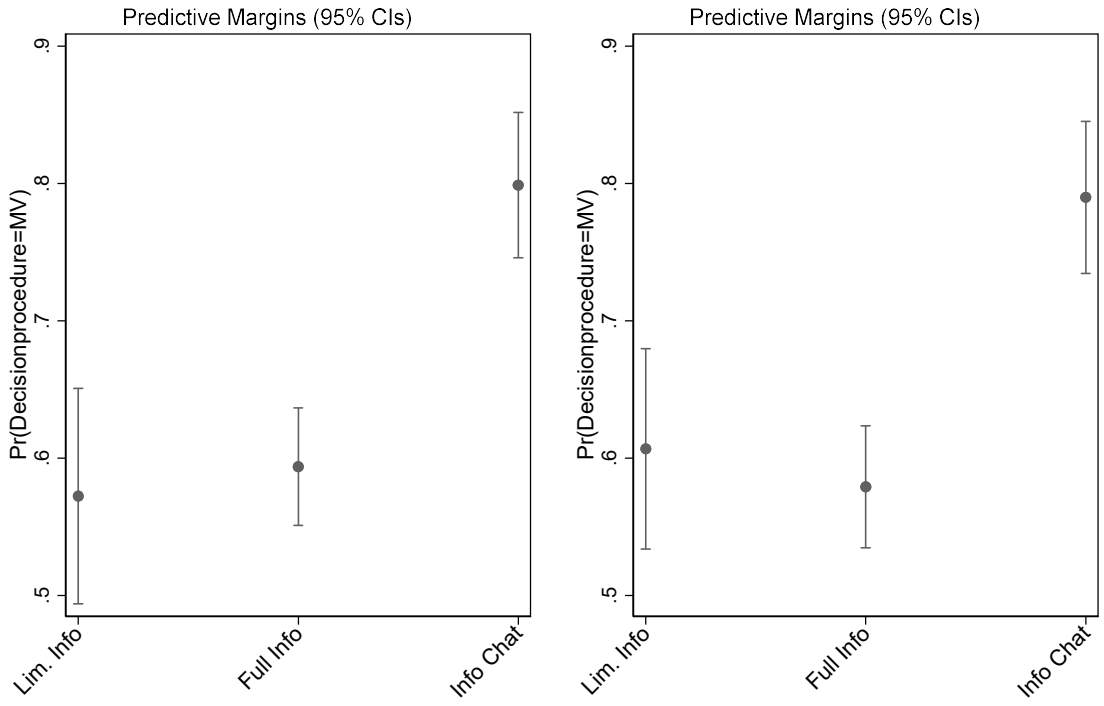


Note: Predictive margins based on Models 1 and 2 from Table 2.

This pattern can also be observed in the right-hand side plot of Figure 2, which gives the predicted probability of choosing MV for different values of E(∆y|MV), averaged over all participants. Apparently, an individual for whom the expected net benefit of a majority vote is higher (lower) is significantly more (less) likely to support MV. However, even for the minimal value of E(∆y|MV), the estimated probability of choosing MV is significantly greater than zero.

[17] Appendix V shows that agents' observed choices on the actual extent of redistribution is consisted with theoretical predictions.

Figure 3. Direct effect of treatment condition on procedural choice

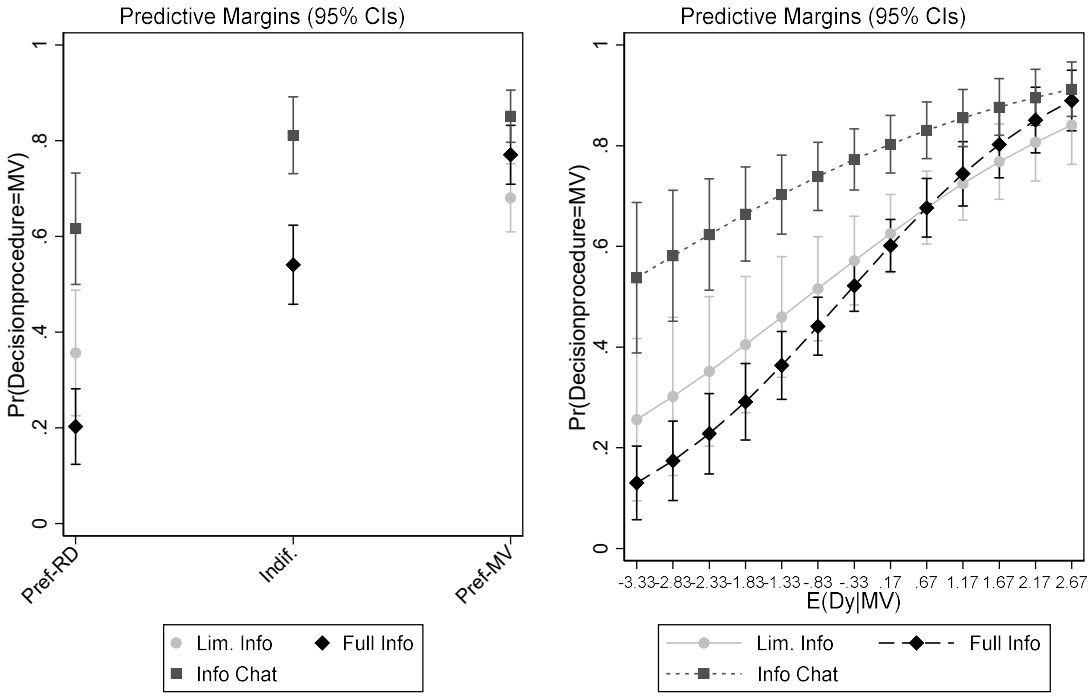


Note: Predictive margins based on Model 1 and 2 from Table 2. Lim. Info. = Limited Information, Full Info = Full Information, Info Chat = Full Information + Chat.

Figure 3 shows the estimated probability of agents choosing MV for the different treatments. While there is no statistically significant difference between the *Limited Information* and the *Full Information* treatment, we see that the *Full Information + Chat* treatment has a strong and positive effect on subjects' likelihood to choose MV. This finding holds irrespective of whether we use dummy variables or E(∆y|MV) to capture participants' rational procedural choice.

Figure 4 shows the effect of subjects' rational procedural preference, conditional on the treatment condition. The left-hand side of the Figure documents the estimated probability of choosing MV, using dummy-variables to characterize agents' procedural preferences, and distinguishes between the three treatments (*Limited Information*, *Full Information*, *Full Information + Chat*). The right-hand side of Figure 4 plots predicted probabilities, depending on E(∆y|MV) for the three treatments.

Figure 4. Conditional effect of rational prediction and treatment condition on procedural choice



Note: Predictive margins based on Models 3 and 4 from Table 2. Lim. Info. = Limited Information, Full Info = Full Information, Info Chat = Full Information + Chat.

Similar to Figure 2, participants' rational procedural preferences, as suggested by our theory, are generally reflected by their actual choices: those agents whose expected income is maximized by a majority vote are significantly more likely to pick MV than those for which the model suggests a preference for the random decider (left panel). Moreover, across all treatments, the expected net payoff of a majority vote E(Δy|MV) has a significantly positive effect on the probability that agents choose MV (right panel). These results confirm our hypothesis (H1) that procedural choices are affected by instrumental motives. As in Figure 2, however, the likelihood of choosing MV is always significantly greater than zero, even for those participants whose net payoff is minimized if the tax is determined by a majority vote.

Looking at the differences across treatments, we observe three striking patterns: first, the relationship between agents' rational procedural preferences and

their actual choices is indeed stronger if agents can easily assess the implications of alternative decision-making procedures for their expected net payoffs, i.e. in the "*Full Information*" treatment. This is vividly illustrated by the steeper slope of the curve relating E(∆y|MV) to the probability of choosing MV in the right-hand side panel of Figure 4. However, the differences between estimated probabilities for the *Full Information* and the *Limited Information* treatment are never statistically significant: for example, while the estimated probability of choosing MV for agents whom theory would predict to pick RD is about 20 percent under the *Full Information* treatment and about 35 percent under the *Limited Information* treatment, the confidence intervals of the two point estimates overlap, and we cannot reject the hypothesis that these probabilities are actually the same. This is in contrast with H2, which claims that blurring individuals' material interests by depriving them of information makes it less likely that their procedural choices are determined by instrumental motives.

What *does* make a difference, however, is the "*Full Info + Chat*" treatment. Figure 4 confirms a pattern that was already suggested by Figure 3: allowing agents to communicate significantly raises the probability of choosing MV. This difference is most pronounced if we consider those individuals whom theory predicts to prefer the random decider: once we add the "chat option", the probability of choosing MV jumps from 20 percent to 62 percent, and the difference between the estimated probabilities is clearly statistically significant. The same pattern can be observed in the right-hand side panel of Figure 4, which documents that, for agents for which the expected net-gain associated with MV is clearly negative (-3.33), the possibility to communicate with other participants raises the estimated likelihood of choosing MV from about 12 percent to about 52 percent. While the "chat option" does not completely dominate participants' instrumental motivation – there is still a significantly positive relationship between the expected net benefit of a majority vote and the estimated likelihood of choosing MV – it significantly raises the probability that agents choose a procedure that is in conflict with their own material interests. Does this indicate that chatting eclipses those interests and lend support to hypothesis *H3*? Not necessarily, since Figure 4 also illustrates that, for those individuals who derive a positive expected net benefit from a majority vote, the impact of E(∆y|MV) on the probability of choosing MV is *highest*

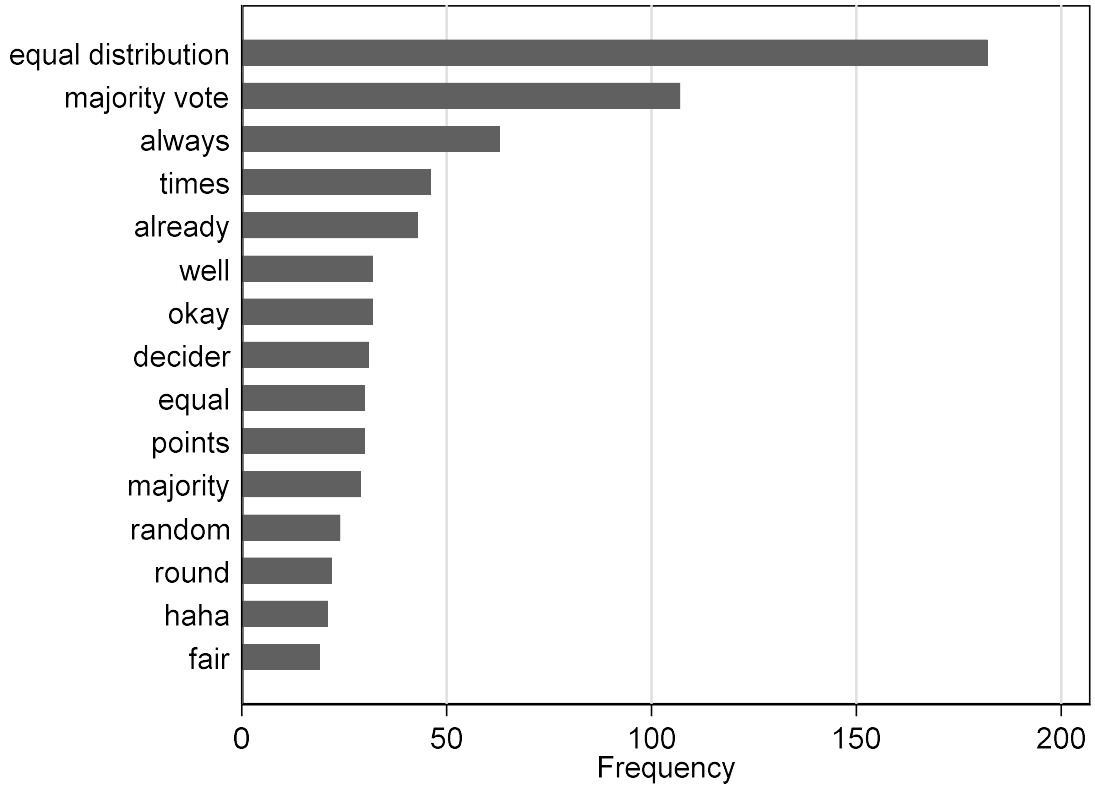
under the *Info + Chat* treatment. While the difference between estimated probabilities is not statistically significant, this suggests that communication enhances the attractiveness of a majority vote if that procedure is in accord with agents' material interest, anyway.

5.2. Probing Deeper: Content of Chat Protocols

Our results suggest that enabling subjects to chat before choosing a decision procedure has a strong positive effect on the likelihood to choose MV, even for negative values of $E(\Delta y|MV)$. From this empirical observation, we conclude that enabling communication activates subjects' normative procedural preferences in favor of MV. There are at least two non-exclusive perspectives on the linkage between communication and normative procedural preferences. First, enabling group communication, even in a very stylized chat window, makes subjects aware of the fact that they are a member of a social group. According to this logic enabling communication has the potential to activate normative procedural preferences, regardless of what group members' actual chat about. Second, group members may use the chat option to provide arguments for and against a certain decision procedure and explicitly deliberate on the merits of alternative procedures.

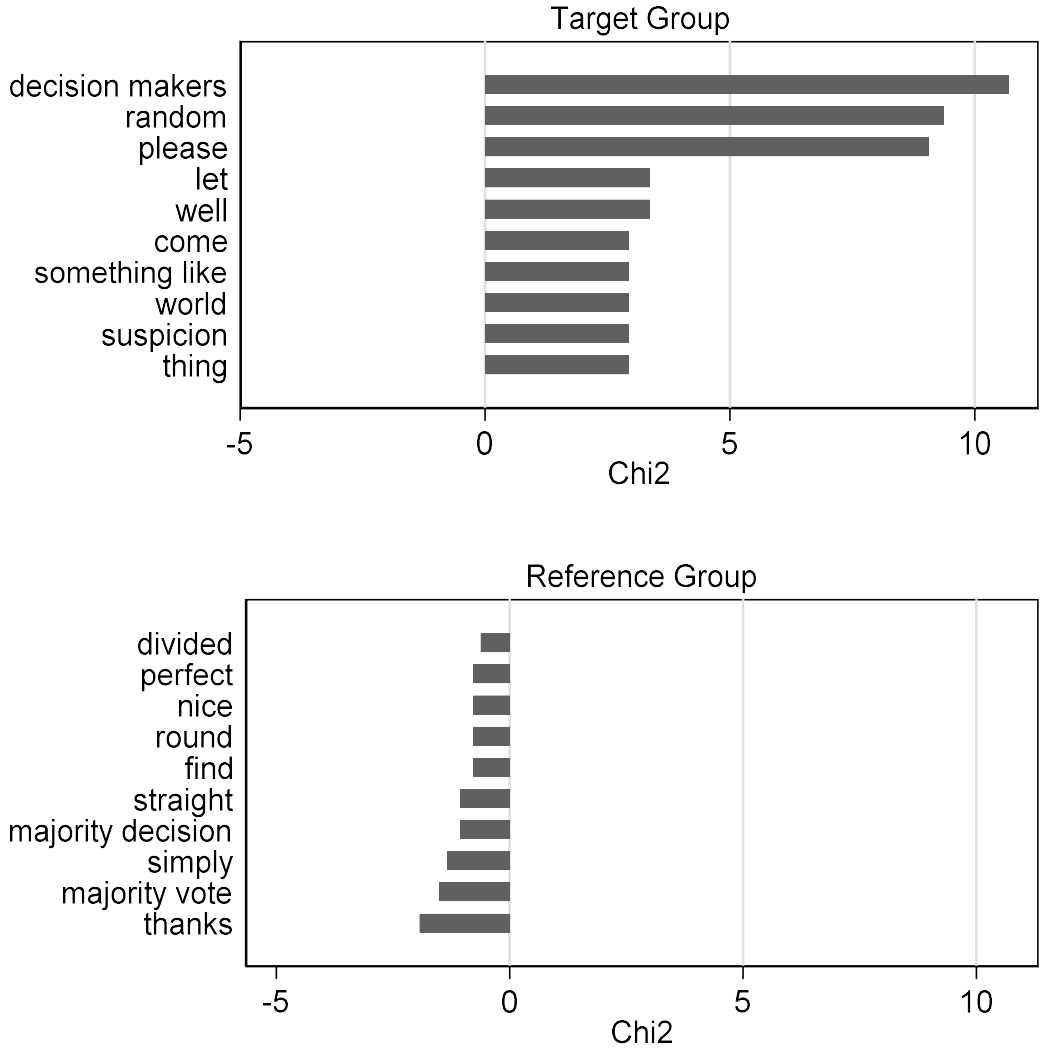
To assess the validity of the latter perspective, we have conducted an explorative analysis of the chat protocols using the R package *quanteda* by Benoit et al. (2018). The chat protocols have only been collected in "Full Information + Chat" Treatment. Before the analysis, we remove punctuation, symbols, numbers, and separators. We do not use a stemmer but required a word length of four characters minimum. Figure 5 shows the 15 most frequently used words. The two words that are mentioned most frequently by far are "equal distribution" and "majority vote". Other frequently used words are "decider", "fair", "equal" and "random". This analysis suggests that subjects use the chat option for meaningful and substantive communication.

Figure 5. Most frequently used words in chat protocol



In a second step of the explorative text analysis, we use the *keyness* option implemented in *quanteda* (Benoit et al. 2018) to compare frequencies of words between target and reference documents. In our case, the target group contains subjects that are predicted to rationally choose RD, and the reference group contains subjects predicted to choose MV or being indifferent in their procedural preference. The results of this analysis are summarized in Figure 6. It shows that, depending on subjects' predicted procedural preference, they use different words in the chat. Again, these results corroborate the interpretation that the chat option is used for meaningful and substantive communication.

Figure 6. Most frequently used word by rational predicted procedural preference



6. Conclusions and Discussion

Our experiment shows that not only in substantial, but also in procedural decision-making, instrumental motives matter (a lot). Under experimental conditions, rational egoistic preferences are a good predictor for the procedural choice between majority voting and the choice of a “random decider”. However, the egoistic prediction is far from perfect, as a significant number of subjects opt for MV although they should rationally choose RD. As hypothesized, their number is higher under conditions of limited information and highest where communication via a chat is possible. Thus, our

findings also provide evidence for the existence and relevance of intrinsic procedural preferences. These seem to be activated where the formation of rational preferences is cognitively difficult and where normative considerations might constitute a more accessible heuristic. The most relevant finding, however, is that even if full information is provided and the formation of rational egoistic preferences thus possible, communication reduces the probability of subjects choosing the dominant option. Apparently, the mere possibility to chat with other group members and exchange arguments – even where time is limited and face-to-face contact impossible – activates considerations of procedural justice more than uncertainty about outcome effects does.

The fact that we find these effects under experimental conditions, where a clear incentive structure is provided and external effects are absent, has positive implications for the way we think about procedural justice and democratic decision-making procedures. If competing material interests and strong incentives do not prevent individuals from attempting to find mutually acceptable rules for decision-making, and if communication induces them to make considerations about procedural justice and democracy effective in procedural choices, procedural consensus does not seem unrealistic. In political practice, increasing polarization and deep divides on the substantial level presently appear to threaten this kind of consensus that liberal democracy rests upon. However, if meaningful and effective communication about procedures is not only possible, but also relevant for individuals' motivation, deliberative processes may help to renew and regain procedural consensus.

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Appendix I: Variable Definitions and Robustness Tests

Table A1. Definition of Variables

Label	Definition
Choice: Decision Procedure	Majority Vote (MV) vs. Random Decider (RD); MV=1, RD=0
Choice: Redistribution	Equality (EQ) vs. Status Quo (SQ), EQ=1, SQ=0
Treatment	Limited Information, Full Information, Full Information + Chat (Reference: Full Information)
Rational Prediction: Decision Procedure	Categorical: MV, Indifferent, RD Continuous: Expected utility form Majority Vote; $E(\Delta y \mid MV)$
Rational Prediction: Redistribution	Categorical: SQ, Indifferent, EQ Continuous: Expected utility form EQ; EU(EQ)
Implemented vs. Preferred Decision Procedure	Implemented decision procedure is identical with the individually preferred decision procedure = 1, otherwise 0
Female	Female=1, Male=0
Period	Period 1 to 8

Table A2. Determinants of Procedural Choice (without distributions entailing an endowment of 18)

	Model 1	**Model 2**	**Model 3**	**Model 4**
	Choice MV	**Choice MV**	**Choice MV**	**Choice MV**
Treatment (Ref. Info.)				
Limited Info (Dummy)	-0.119	0.0956	-0.414	0.0262
	[0.26]	[0.23]	[0.29]	[0.25]
Info Chat (Dummy)	1.431***	1.377***	1.480***	1.296***
	[0.25]	[0.25]	[0.36]	[0.24]
Rational Prediction (Ref. Indif.)				
Pref-RD (Dummy)	-1.188***		-1.643***	
	[0.22]		[0.34]	
Pref-MV (Dummy)	0.801***		1.060***	
	[0.21]		[0.27]	
E(∆y|MV)		0.610***		0.730***
		[0.09]		[0.13]
Interaction Terms				
Pref-RD # Limited Info			1.078**	
			[0.54]	
Pref-RD # Info Chat			0.780	
			[0.51]	
Pref-MV # Info Chat			-0.684	
			[0.45]	
Limited Info # E(∆y|MV)				0.0914
				[0.23]
Info Chat # E(∆y|MV)				-0.385**
				[0.19]
Controls				
Female	0.255	0.203	0.296	0.229
	[0.20]	[0.20]	[0.20]	[0.20]
Period (1-8)	-0.0626*	-0.0338	-0.0619*	-0.0350
	[0.03]	[0.03]	[0.03]	[0.03]
Observations	1134	1134	1134	1134
AIC	1291.1	1322.7	1286.3	1319.4
BIC	1331.4	1358.0	1341.6	1364.7

Note: Binary logistic regression with random-effects, clustered by subject (N=162 x 8). Standard errors in brackets, *p<0.10, **p<0.05, ***p<0.01

Appendix II: Deriving the Probability of Complete Redistribution for MV and RD

Appendix II.1: Full Information

If individuals not only know their personal and the average endowment, but also the *distribution* of endowments, it is easy to derive the probability they assign to an outcome of complete redistribution. This is summarized by the following expression:

$$\text{(A1)} \qquad p(MV) = \begin{cases} 0 & \text{if} \quad \sum_i \mathbf{1}_{y_i>8} = 2 \\ 0.5 & \text{if} \quad \sum_i \mathbf{1}_{y_i=8} \geq 1 \\ 1 & \text{if} \quad \sum_i \mathbf{1}_{y_i<8} = 2 \end{cases},$$

where $\sum_i \mathbf{1}_{y_i>8} = 2$ indicates that two members of the group have an endowment greater than 8, and $\sum_i \mathbf{1}_{y_i<8} = 2$ that two members of the group have an endowment below 8. If two participants have an endowment *above* the average of 8 (the first row), and if – as we assume – all individuals select the value of τ that maximizes their after-tax income, the majority's rejection of complete redistribution prevails in a majority vote, and the outcome is $\tau = 0$ with certainty, i.e. *p(MV)* = 0.[18] Conversely, if two group members have an endowment *below* the average of 8, a majority vote results in complete redistribution with certainty, i.e. *p(MV)* = 1. We assume that individuals with an endowment of 8 – i.e. equaling the group average – are indifferent between complete redistribution and no redistribution, and we assign a probability of 0.5 to them choosing $\tau = 0$ or $\tau = 1$. Hence, if at least one group member receives the average endowment, complete redistribution ($\tau = 1$) is as likely as the absence of redistribution ($\tau = 0$).[19]

If the redistribution decision is taken by a *random decider* (RD) and individuals know the distribution of endowments, the probability of complete redistribution can be computed as follows:

[18] Obviously, it is impossible that *all three group members* have an endowment above or below the average.

[19] Of course, if two group members receive the average endowment of 8, this also applies to the third group member.

(A2) $$p(RD)=\begin{cases} 1/3 & \text{if} \quad \sum_i \mathbf{1}_{y_i>8}=2 \\ 0.5 & \text{if} \quad \sum_i \mathbf{1}_{y_i=8}\geq 1 \\ 2/3 & \text{if} \quad \sum_i \mathbf{1}_{y_i<8}=2 \end{cases}$$

The expression in (3) highlights the key difference between the two procedures: given our assumption that all individuals prefer the tax rate that maximizes their after-tax income, a majority of individuals with below-average (above-average) endowments *guarantees* that a vote results in complete (no) redistribution under MV. By contrast, the choice of RD as a procedure implies that a member of the minority may end up as the random decider with probability 1/3. This is why the probability of complete redistribution is larger than zero even if a majority of group members has an endowment above the average, and smaller than one, even if a majority of group members has an endowment below the average. If at least one member of the group has the average endowment of 8, both redistributional outcomes are equally likely. Combining (A1) and (A2) yields the expression (2) in the main text.

Appendix II.2: Limited Information

We now demonstrate how to compute the probability of complete redistribution for the two available procedures (MV and RD) from the perspective of an individual who has limited information, i.e. only knows her own endowment, the sum of endowments, and the average endowment. If individual i's endowment exceeds 16, both other group members obviously have endowments below 8, such that a majority vote (MV) is certain to result in complete redistribution, i.e. p(MV) = 1. By contrast, RD would mean that individual i has a 33% chance to end up as the random decider. Hence p(RD) = 0.67 in this case. Things are more complex for $y_i < 17$. Table A3 describes the computation of p(MV) and p(RD) for a situation where $y_1 = 5$. Of course, the derivation of the relevant probabilities is identical for M2 if $y_2 = 5$. If M1 receives an endowment of 5 units, the remaining endowments must add up to 19. This may result from $y_2 = 19$ and $y_3 = 0$ or $y_2 = 18$, and $y_3 = 1$ etc. In total, there are 20 constellations that satisfy $y_2 + y_3 = 19$, all of which occur with equal probability 1/20 = 0.05.

This is reflected by the fourth column of Table A3. The fifth column indicates whether a given constellation results in a majority of below-average or above-average endowments, taking a value of 1 in the first case and a value of 0 in the latter case. If one participant has an endowment of 8, there is no clear majority, and the likelihood of redistribution equals 0.5. The sixth column multiplies the probability that a specific distribution occurs (conditional on $y_1 = 5$) with the probability that such a distribution results in complete redistribution. Adding up these probabilities yields the probability of redistribution conditional on $y_1 = 5$, which is 0.85. The seventh column does the same for the "random decider", taking into account that the probability of complete redistribution is 2/3 if there is a majority with below-average endowments, and 1/3 if there is a majority with below-average endowments. This reflects the fact that a member of the minority may be picked as random decider. Adding up the probabilities in the seventh column yields p(RD) = 0.617 conditional on $y_1 = 5$.

Table A3: Deriving the probability of complete redistribution under a majority vote (MV) or a random decider (RD) for the limited-information case from the perspective of a participant (M1) with an endowment $y_1 = 5$.

M1	M2	M3	Prob	= 1 if majority pro tax	Product	Prob(random decider pro tax)
5	19	0	0.05	1	0.05	0.033
5	18	1	0.05	1	0.05	0.033
5	17	2	0.05	1	0.05	0.033
5	16	3	0.05	1	0.05	0.033
5	15	4	0.05	1	0.05	0.033
5	14	5	0.05	1	0.05	0.033
5	13	6	0.05	1	0.05	0.033
5	12	7	0.05	1	0.05	0.033
5	11	8	0.05	0.5	0.025	0.025
5	10	9	0.05	0	0	0.017
5	9	10	0.05	0	0	0.017
5	8	11	0.05	0.5	0.025	0.025
5	7	12	0.05	1	0.05	0.033
5	6	13	0.05	1	0.05	0.033
5	5	14	0.05	1	0.05	0.033
5	4	15	0.05	1	0.05	0.033
5	3	16	0.05	1	0.05	0.033
5	2	17	0.05	1	0.05	0.033
5	1	18	0.05	1	0.05	0.033
5	0	19	0.05	1	0.05	0.033
			Prob(τ = 1):		**0.850**	**0.617**

Of course, the derivation of probabilities follows the same pattern for all other endowments between 0 and 24. The second and third columns in Table A4 present the resulting values for p(MV) and p(RD) – i.e. the probability of complete redistribution, conditional on a given endowment and a given procedure (MV or RD). These are the results underlying expression (3) in the main text. The fourth column in Table A4 gives the expected net benefit associated with a majority vote, i.e. $E\left(\Delta y \middle| MV\right) = \left[p\left(MV\right) - p\left(RD\right) \right] \cdot \left(\overline{y} - y_i\right)$. Note that – with the exception of $y_i = 8$, which implies that participants are indifferent between the two procedures – individuals prefer

MV over RD if their endowment is smaller than 14. These are the results underlying the assessments in Table 1b in the main text.

Table A4: Probability of complete redistribution under MV and RD, and expected net benefit of MV for the limited-information case, conditional on participants' endowments

Endowment y_i	p(MV)	p(RD)	E(Δy | MV)
0	0.68	0.56	0.96
3	0.77	0.59	0.91
5	0.85	0.62	0.70
6	0.89	0.63	0.53
7	0.94	0.65	0.30
8	0.50	0.50	0.00
9	0.06	0.35	0.29
10	0.13	0.38	0.49
11	0.21	0.40	0.57
12	0.31	0.44	0.51
14	0.55	0.52	-0.18
15	0.70	0.57	-0.93
16	0.89	0.63	-2.07
18	1.00	0.67	-3.33

Note: Yellow = MV, Green= RD, White= Indifferent. Individuals know the sum of endowments as well as the average endowment, but are ignorant about the actual distribution of endowments. The second and third columns show the probability of complete redistribution in case of a majority vote (MV) and a random decider determining the tax rate (RD). The fourth column shows the expected net payoff associated with a majority vote.

Appendix III.

Instructions (Translation)

Subjects are randomly divided into a group of three people and receive a random endowment between 0 and 24 points. The sum of endowments in a group **is always 24 points**. The group has the task of deciding whether to distribute the endowment evenly among the group members (equal distribution) or to maintain the original allocation of endowments.

The decision is made in two stages. The first stage determines the decision-making procedure. Each group member gives his procedural preference in an urn from which the implemented decision procedure is drawn. In the second stage, the redistribution is decided on the basis of the decision procedure drawn from the urn.

Information

[Treatment - No Info] You will be informed about your endowment with points. You do not know the endowment of the other two group members.

[Treatment - Info] You will be informed about your endowment with points and about the endowment of the two other group members.

[Treatment - Info Chat] You will be informed about your endowment with points and about the endowment of the two other group members. In addition, you have the possibility to exchange information using a chat window before you vote on the decision procedure.

First stage: Decision procedure

In the first stage, you vote for the decision procedure you prefer. From the three votes cast in the group, one is drawn at random from a urn, and this vote determines the decision-making process. There are two procedures to choose from:

A Majority voting: Equal distribution occurs when at least two members of the group vote for equal distribution. If at least two group members vote against equal distribution, the original allocation of endowments is retained.

B Random group member: A randomly selected group member determines whether the equal distribution is achieved, whereby each group member has the same probability of being drawn as a decision-maker.

Second stage: Redistribution decision

At this stage, the decision procedure selected from the urn is implemented. You choose one of the following two options:

A No equal distribution: Each player keeps his original random endowment, i.e. between 0 and 24 points.

B Equal distribution: The endowment of the three group members is added together and divided by the three group members so that each group member receives the same number of points, i.e. each player receives 8 points.

Repetitions

This procedure is repeated five times in total, i.e. you make five decisions about the decision procedure and five decisions about redistribution. Each time you are randomly assigned to a new group of three.

At the end of the experiment, one round is randomly selected from this part of the experiment and your earnings in this round are taken into account for your payment in euros.

Instruktionen (German)

Sie werden zufällig in eine Gruppe von drei Personen eingeteilt und erhalten eine zufällige Ausstattung zwischen 0 und 24 Punkten. Die Summe der Ausstattungen in einer Gruppe beträgt **immer 24 Punkte**. Die Gruppe hat die Aufgabe, darüber zu entscheiden, ob die Ausstattungen gleichmäßig unter den Gruppenmitgliedern verteilt werden sollen (Gleichverteilung) oder die ursprüngliche Zuteilung der Ausstattungen beibehalten werden soll.

Die Entscheidung darüber wird in zwei Stufen getroffen. In der ersten Stufe wird das Entscheidungsverfahren bestimmt. In der zweiten Stufe wird auf Grundlage des Entscheidungsverfahrens über die Umverteilung entschieden.

Information

[Treatment - No Info] Sie werden über Ihre Ausstattung mit Punkten informiert. Die Ausstattung der beiden anderen Gruppenmitglieder ist Ihnen nicht bekannt.

[Treatment - Info] Sie werden über Ihre Ausstattung mit Punkten und über die Ausstattung der beiden anderen Gruppenmitglieder informiert.

[Treatment - Info Chat] Sie werden über Ihre Ausstattung mit Punkten und über die Ausstattung der beiden anderen Gruppenmitglieder informiert. Zusätzlich haben Sie die Möglichkeit, sich über einen Chat auszutauschen bevor Sie über das Entscheidungsverfahren abstimmen.

Erste Stufe: Entscheidungsverfahren

In der ersten Stufe geben Sie Ihre Stimme für das von Ihnen präferierte Verfahren ab. Aus den drei abgegebenen Stimmen in der Gruppe wird zufällig eine gezogen, und diese Stimme bestimmt das Entscheidungsverfahren. Es stehen zwei Verfahren zur Auswahl:

A: Mehrheitswahl: Die Gleichverteilung kommt zustande, wenn mindestens zwei Gruppenmitglieder für die Gleichverteilung votieren. Votieren mindestens zwei Gruppenmitglieder gegen die Gleichverteilung, wird die ursprüngliche Zuteilung der Ausstattungen beibehalten.

B: Bestimmung durch einen zufälligen Entscheider: Ein zufällig ausgewähltes Gruppenmitglied bestimmt, ob die Gleichverteilung zustande kommt, wobei jedes Gruppenmitglied die gleiche Wahrscheinlichkeit hat, als Entscheider ausgelost zu werden.

Zweite Stufe: Umverteilungsentscheidung

In dieser Stufe wird das per Losentscheid ausgewählte Entscheidungsverfahren angewendet. Sie entscheiden sich für eine der beiden folgenden Optionen:

A: Keine Gleichverteilung: Jeder Spieler behält seine ursprüngliche zufällige Ausstattung, d.h. zwischen 0 und 24 Punkten.

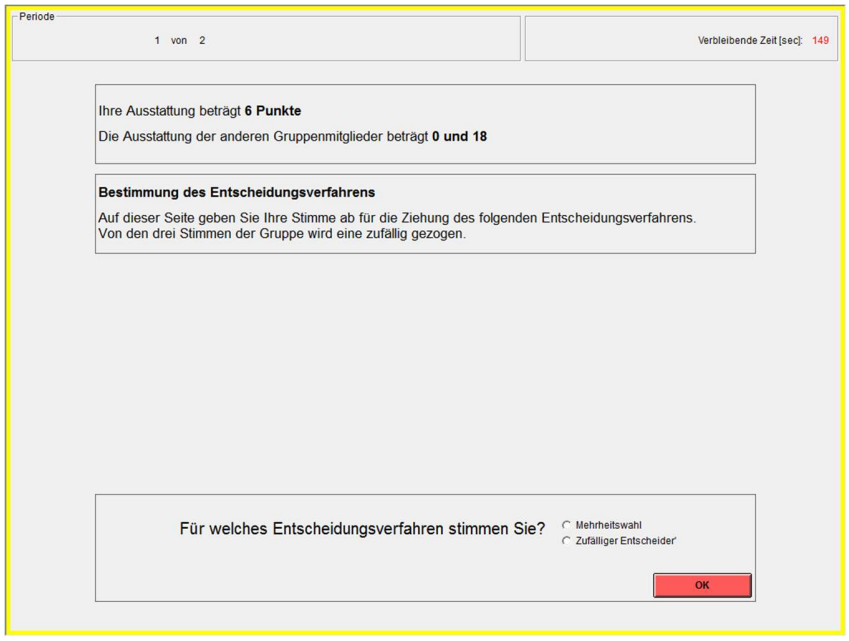
B: Gleichverteilung: Die Ausstattungen der drei Gruppenmitglieder werden zusammengezählt und durch die drei Gruppenmitglieder geteilt, sodass jedes Gruppenmitglied die gleichen Punkte erhält, d.h. jeder Spieler erhält 8 Punkte.

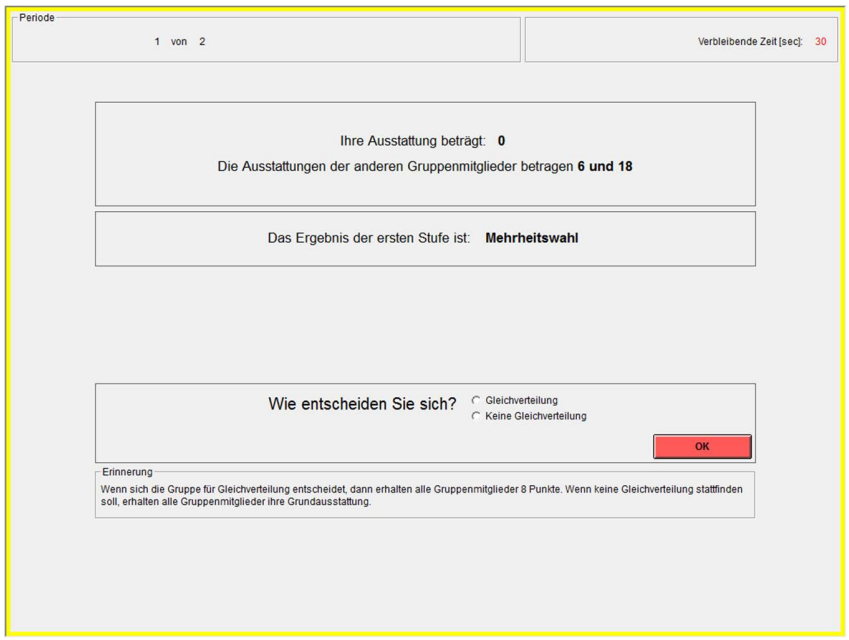
Wiederholungen

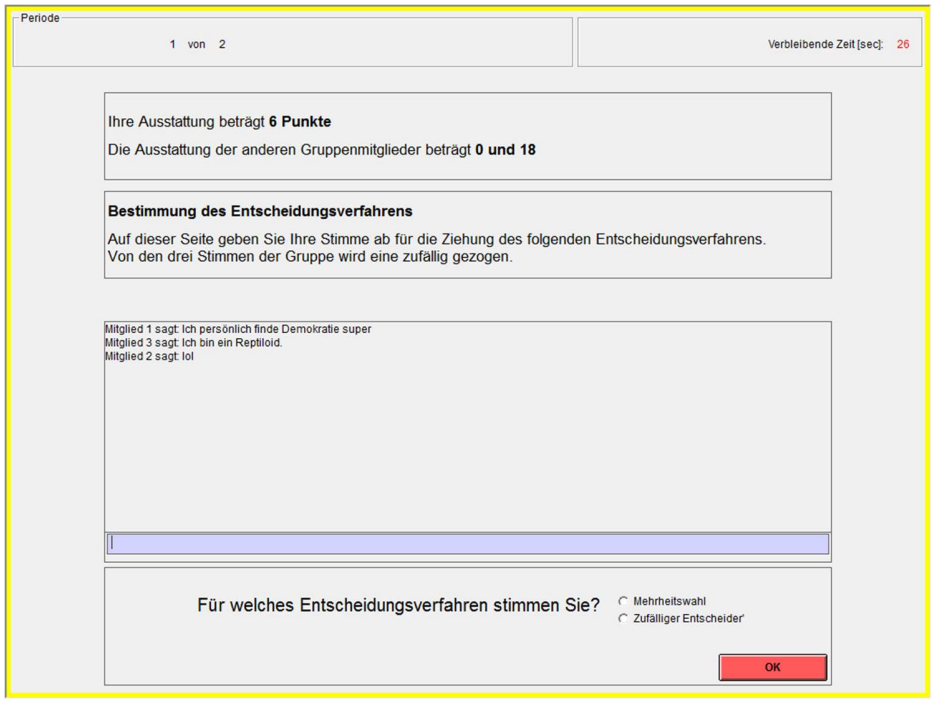
Diese Prozedur wird insgesamt fünfmal wiederholt, das heißt Sie treffen fünfmal eine Entscheidung über das Entscheidungsverfahren und fünfmal eine Entscheidung über die Umverteilung. Dabei werden Sie jedes Mal zufällig einer neuen Dreiergruppe zugeordnet.

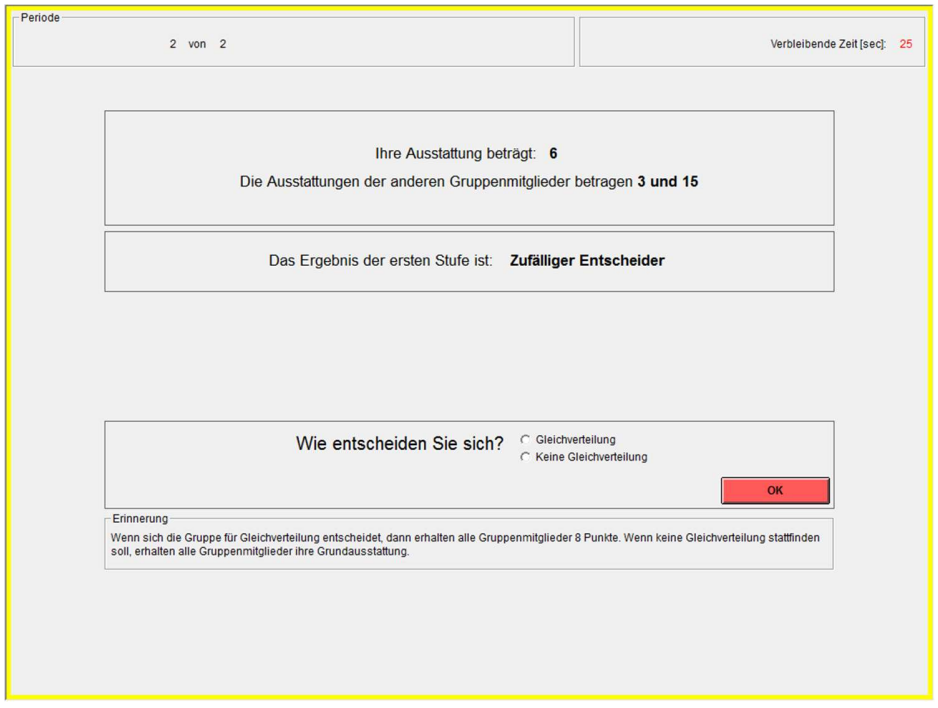
Am Ende des Experiments wird zufällig eine Runde aus diesem Teil des Experiments ausgewählt und Ihr Verdienst in dieser Runde wird für Ihre Bezahlung in Euro berücksichtigt.

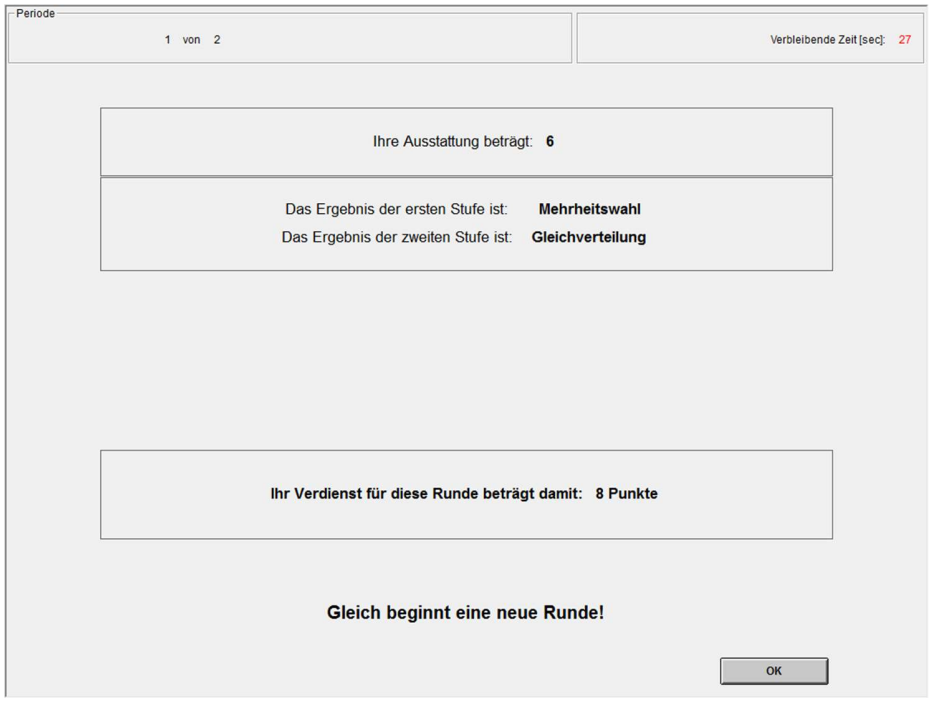
Appendix IV. Screenshots (German)






Periode
1 von 2
Verbleibende Zeit [sec]: 26
Ihre Ausstattung beträgt **6 Punkte**
Die Ausstattung der anderen Gruppenmitglieder beträgt **0 und 18**
Bestimmung des Entscheidungsverfahrens
Auf dieser Seite geben Sie Ihre Stimme ab für die Ziehung des folgenden Entscheidungsverfahrens.
Von den drei Stimmen der Gruppe wird eine zufällig gezogen.
Mitglied 1 sagt: Ich persönlich finde Demokratie super
Mitglied 3 sagt: Ich bin ein Reptiloid.
Mitglied 2 sagt: lol
Für welches Entscheidungsverfahren stimmen Sie?
Mehrheitswahl
Zufälliger Entscheider'
OK


Periode
2 von 2
Verbleibende Zeit [sec]: 25
Ihre Ausstattung beträgt: **6**
Die Ausstattungen der anderen Gruppenmitglieder betragen **3 und 15**
Das Ergebnis der ersten Stufe ist: **Zufälliger Entscheider**
Wie entscheiden Sie sich?
Gleichverteilung
Keine Gleichverteilung
OK
Erinnerung
Wenn sich die Gruppe für Gleichverteilung entscheidet, dann erhalten alle Gruppenmitglieder 8 Punkte. Wenn keine Gleichverteilung stattfinden soll, erhalten alle Gruppenmitglieder ihre Grundausstattung.

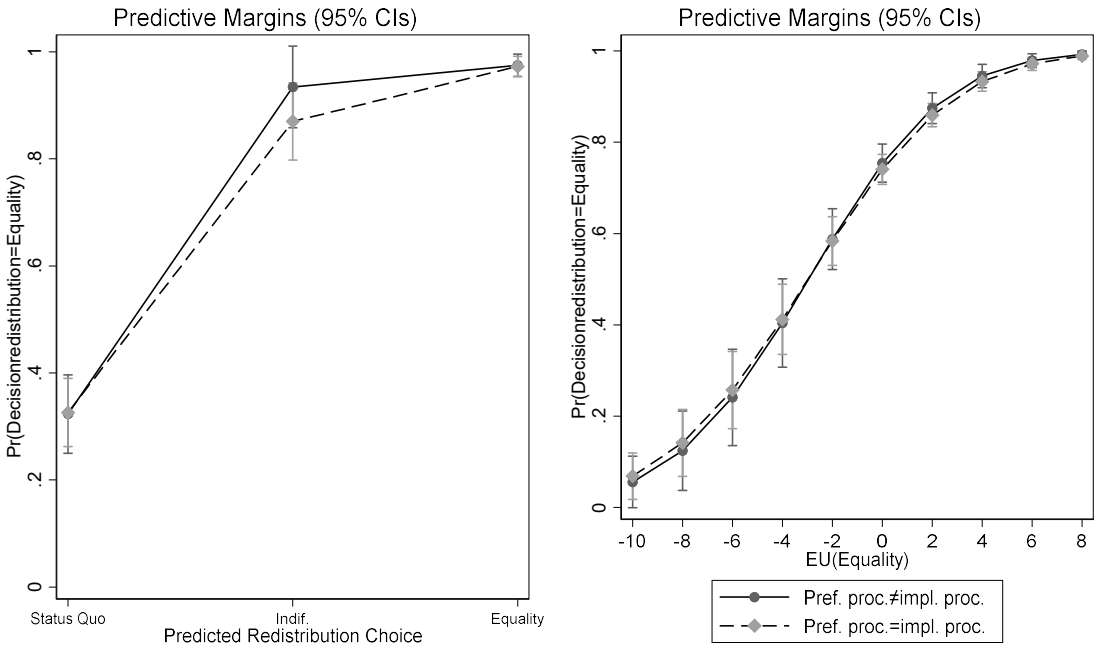

Periode
1 von 2
Verbleibende Zeit [sec]: 27
Ihre Ausstattung beträgt: 6
Das Ergebnis der ersten Stufe ist: Mehrheitswahl
Das Ergebnis der zweiten Stufe ist: Gleichverteilung
Ihr Verdienst für diese Runde beträgt damit: 8 Punkte
Gleich beginnt eine neue Runde!
OK

Appendix V: How rational are subjects' choices of tax rates?

Our hypothesis that agents choose the procedure that maximizes their expected net-payoff is closely linked to the notion that individuals' *redistribution decision* is also rational and selfish. To test the empirical validity of this presumption, we conducted a set of auxiliary regressions, estimating the effect of subjects' predicted preference over alternative tax rates ($\tau = 0$ or $\tau = 1$) on their actual redistribution choice in the second stage of the experiment (see Figure 1). The hypothetical preference over alternative tax rates is measured either with a set of dummies (Status Quo, Equality, Indifference) or as the expected material net benefit subjects derive from complete redistribution (EU(Equality)). Moreover, we tested whether subjects' redistribution choice in the second stage of the experiment was affected by whether the implemented decision procedure was or was not their individually preferred decision procedure. In terms of rational choice, losing the nature draw at the end of the first stage of the experiment should not affect subjects' rational preference for or against equal redistribution; in psychological terms, however, it might matter. Thus, we test whether this experience conditions subjects' preference over alternative tax rates. The estimation results are visualized in Figure A1. The set of estimated coefficients is displayed in Table A5.

Figure A1 documents that agents' theoretical preference over alternative tax rates goes a long way in predicting their actual choice of redistribution in the second stage of the experiment, regardless of whether their preferred procedure has been implemented or not.

Figure A1. Conditional effect of rational prediction and preferred vs. implemented decision procedure on redistribution choice



Note: Based on Model 1 and 2 from Appendix Table A5.

Table A5. Determinants of agents' redistribution choice

	Model 1	**Model 2**
	Choice Equality	**Choice Equality**
Treatment (Ref. Info)		
Limited Info (Dummy)	0.592	0.429
	[0.49]	[0.35]
Info Chat (Dummy)	2.587***	1.994***
	[0.60]	[0.47]
Rational Prediction (Ref. Indifferent)		
Status Quo (Dummy)	-5.946***	
	[1.08]	
Equality (Dummy)	1.383	
	[1.10]	
EU(Equality)		0.591***
		[0.07]
Prefered Procedure = Implemented Procedure (Ref. No)		
Yes	-1.156	-0.108
	[0.99]	[0.18]
Interaction Terms		
Pro_win=1 # ind_rat_reU	-1.156	-0.108
	[0.99]	[0.18]
Status Quo # Yes	1.179	
	[1.01]	
Equality # Yes	1.047	
	[1.14]	
EU(Equality) # Yes		-0.0399
		[0.07]
Controls		
Female	0.583	0.663**
	[0.44]	[0.33]
Observations	1296	1296
AIC	745.0	963.9
BIC	796.7	1005.2

Note: Binary logistic regression with random-effects, clustered by subject (N=162 x 8). Standard errors in brackets, *p<0.10, **p<0.05, ***p<0.01