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# The Effect of Voting Procedures on the Acceptance of Redistributive Taxation. Evidence from a Two-Stage Real-Effort Laboratory Experiment

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## Abstract

This study explores the effect of voting procedure on the acceptance of redistribution in the context of a simplified Meltzer-Richard (1981) model. In a series of laboratory experiments, we test the effect of majority voting, unanimous consent and random dictatorship on subjects' acceptance of the implemented tax rate, whereas acceptance is measured in terms of subjective satisfaction and effort reduction. We find that acceptance of the implemented tax rate is significantly higher under unanimous consent compared to the majority voting and random dictator procedures. This effect also holds for those who lost the election. Losers' acceptance of the implemented tax rate is significantly higher in the treatment unanimous consent compared to majority voting and a random dictator. Although our data shows that the net payers of redistribution reduce their effort in the next round, the voting procedure exerts no direct or indirect effect on subjects' likelihood to reduce effort.

**Keywords:** redistribution, procedural justice, laboratory experiment, taxation, legitimacy

**JEL classification:** C91, C92, D72

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# 1 Motivation

To find an agreement on the amount of income redistribution that is best for society has always been a central theme of political dispute (Jacoby, 1994; Fuchs and Klingemann, 1990). Market-liberals emphasize that redistribution will cause the net payers of redistribution to reduce work effort and thereby diminishes overall welfare. While social-democrats, on the other side of the political spectrum, usually acknowledge the negative effects from too much redistribution, they emphasize its positive effects for society and are much less worried about its effect on the work effort of net payers. Although there is no magical solution to make conflict over redistribution disappear, from a normative perspective we would like to establish voting procedures that produce legitimate and accepted outcomes.

In political science, the effect of election outcomes on how people feel about the legitimacy of the political process has been studied under the label of the “winner–loser gap” (for review Anderson et al., 2005). By definition, elections create winners and losers. Losing an election may generate ambivalent or negative attitudes towards the legitimacy and acceptance of the electoral result (Kaase and Newton, 1995, p. 60). Anderson et al. (2005) develop a macro comparative model that focuses on how election outcomes and the sorting of voters into winners and losers affects their legitimacy beliefs. This study seeks to contribute to this literature by developing an experimental design which enables us to observe the attitudinal and behavioral response of electoral losers.

This study tests whether choosing an appropriate voting procedure helps to reduce the “winner–loser gap” in the context of the Meltzer-Richard (1981, henceforth MR). The main prediction of the MR Model is that the linear tax rate is higher in societies that are more unequal. This prediction has been subject to extensive comparative (Alesina and Giuliano, 2009; Acemoglu and Robinson, 2000; Huber and Stephens, 2012) and laboratory research (Agranov and Palfrey, 2015; Kittel et al., 2015; Barber et al., 2013; Tyran and Feld, 2006; Esarey et al., 2012). Another aspect of the MR Model, which has received much less attention, concerns the net payers of redistribution and how they respond in terms of choosing work effort. So, the cake that is going to be redistributed shrinks if the net payers’ response towards redistribution is to lower their work effort in the next round. Those who benefit from redistribution must anticipate that the net payers of redistribution will reduce their work effort in the next round when they do not accept the group’s decision. Depending on the actual size of effort reduction, those who were initially in favor of redistribution might become net payers in the next round.

The question of how electoral losers resp. net payers of redistribution respond is at the center of this study. Specifically, we are interested in seeing how altering the voting procedure from majority to unanimous consent and random dictatorship<sup>1</sup> affects subjects’ acceptance of redistributive taxation. To this end, we designed a two-stage real effort laboratory experiment. In the first stage, subjects earn their endowment through a real effort task and vote on a tax rate. In the second stage, subjects do the same real effort task again. While keeping the redistribution mechanism constant (proportional taxation), we test the effect of the voting procedure on subjects’ acceptance of the linear tax rate. Subjects’ acceptance is measured in two ways, first, in terms of subjective satisfaction and second in terms of effort reduction between the first and the second real-effort task. We find that acceptance of the implemented tax rate is significantly higher under unanimous consent when compared to majority voting and a random dictator. This effect also holds for those who lost the election. Losers’ acceptance of the implemented tax rate is significantly higher in the treatment unanimous consent compared to majority voting and a random dictator. Although our data shows that the net payers of redistribution reduce their effort in the next round, the voting procedure exerts no direct or indirect effect on subjects’ likelihood to reduce effort.

This study is organized as follows: The second Section presents the theoretical framework and expectations on how electoral procedures affect the acceptance of redistributive taxation. The experimental design and procedure is presented in the third Section, followed by the presentation of empirical findings

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<sup>1</sup>The terms “random dictator”, “lottery” and “sortition” are used to describe the same voting procedure. In the following, we will refer to this mechanism as “random dictator”, even though we did not use this expression in the experiment due to its negative connotation.

in Section 4. The last Section discusses these results and concludes.

## 2 Theoretical Framework

### 2.1 Voting on Redistribution

A redistributive regime consists of two components; a redistributive mechanism and a voting procedure. In the MR model, the redistributive mechanism, which ensures that the sum of gross and net incomes is equal, is a linear tax rate  $\tau$ . The redistribution mechanism for  $N$  individuals with *gross incomes*  $x_1, \dots, x_N$  can be defined as:

$$y_i = (1 - \tau)x_i + \tau \bar{x}, \quad (1)$$

where  $y_i$  is the *gross income* of individual  $i$  under redistributive *tax rate*  $\tau$ . The average net income is denoted  $\bar{x} = \frac{1}{N} \sum_{j=1}^n x_j$ . Individuals with net income below the average ( $x_i < \bar{x}$ ) maximize their income through full redistribution ( $\tau = 100\%$ ), which is their rational choice under egoistic preferences. Analogously, endowments above average ( $x_i > \bar{x}$ ) lead to a preference for no redistribution. Individuals with endowments being exactly  $\bar{x}$  are indifferent in the standard model because their net and gross income remains the same regardless of the collectively agreed tax rate. Therefore, the distributional conflict in the group is polarized except for indifferent individuals.

The voting procedure defines the method used to aggregate individual preferences over *tau*. In the MR model, majority rule is used to aggregate preferences over  $\tau$ . Under the premise of rational voters, the median voter theory provides a rational prediction of the individual vote and group decision. Given the polarized distributional conflict, the group decision will also be polarized, meaning that either  $\tau = 100\%$  or  $\tau = 0\%$  is implemented with a very slight majority. In the case of  $\tau = 100\%$ , the reaction of net payers of redistribution might be particularly strong in terms of effort reduction.

### 2.2 Winner–Loser Gap

Voter’s acceptance of an electoral outcome is closely related to its perceived legitimacy. Legitimacy is a central political normative term that contains the sum of beliefs that can be used to recognize a collective decision as legitimate and to adhere to it (Tyler, 2006; Weatherford, 1992). If the electoral result is perceived as illegitimate, this perception is expected to affect subject’s acceptance of the electoral results in terms of attitudes and behavior.

Voters’ response toward electoral outcomes is central to the “winner–loser gap” literature in political science (Anderson et al., 2005; Anderson and Guillory, 1997). From this literature, it is well known that individuals who voted for the winning party in an election tend to be more satisfied with democracy than those who did not (Singh, 2014). So how do the losers respond? The “winner–loser gap” rests on two premises: First, the ‘winner–loser gap’ is related to the benefits that winning and losing bestow on voters. Second, aside from utilitarian motivations, it is known from the seminal work of Tversky and Kahneman Tversky and Kahneman (1992) that people have a strong irrational desire to avoid losing. People prefer the chance of winning over an equally high chance to lose (Thaler, 1994; Kahneman et al., 1997). Moreover, winning and losing is likely to generate emotional responses, such that losing leads to anger and disillusion while winning makes people more satisfied (Holmberg, 1999; Anderson et al., 2005).

The number of electoral losers depends on the actual voting procedure. Voting procedures can shape both the number of electoral losers and the extent of the loss felt by voters (Anderson et al., 2005). The idea that voting procedures shape the experience of winning and losing is another focus of this study. This study tests whether altering the voting procedure in the context of a distributional conflict helps to close the “winner–loser gap”.

## 2.3 Voting Procedures

Exploring the properties of voting procedures is a central theme in public choice theory (Mueller, 2003, Ch. 4). If redistribution is considered a public good from which all can benefit, the voting procedure would be unanimous consent Ashworth et al. (2002). Wicksell (1896) argued that decisions about the provision of public goods should be made using unanimous consent. His 'new principle of taxation' is based on a combination of unanimous voting and separate taxes for public goods. Unanimous consent is the only voting procedure that leads to Pareto-preferred public good quantities and shares of taxes (Mueller, 2003, Ch. 4). There are two main objectives that speak against the use of unanimous consent: First, finding unanimous consent is going to require considerable time, particularly in larger communities with heterogeneous tastes (Buchanan and Tullock, 1962, Ch. 6, Black, 1958, p. 146-7). Second, unanimous consent encourages strategic behavior in a way that voters try to test the others' willingness to make concessions. Such strategic bargaining can further delay a consensual agreement, even though experimental studies by Spitzer and Hoffman (1986) and Smith (1977, 1979) suggest that strategic bargaining is not much of a problem (Mueller, 2003, Ch.4). Wicksell's (1896) advocacy for the use of unanimous consent is based on its most distinct normative property, which is that it protects individuals from being 'coerced' by other members of the community. Therefore, unanimous consent equips each member of a group with a veto position.

When the voting procedure allows voters to pass an issue with less than unanimous consent, the possibility exists that some individuals will be left worse off (Mueller, 2003, p. 74). Therefore, the use of a less-than-unanimity voting procedure can be said to impose a cost on those who are impacted negatively by the electoral results. Buchanan and Tullock (1962) refer to these costs as the "external costs" of a voting rule. On the other hand, there are the costs of additional time and effort required to redefine the issue so that its passage benefits all (Mueller, 2003, p. 74). Buchanan and Tullock (1962) refer to these costs as the "decision time costs" of a voting rule. Both types of costs are a function of the size of the required majority (quorum), whereas "external cost" decrease with a higher quorum, the "decision time costs" increase with a higher quorum. Buchanan and Tullock (1962) were the first to discuss the trade-off between "external" and "decision time costs" of a voting rule systematically. Buchanan and Tullock (1962) conclude that a society's choice of the optimal majority, ranging from a single (random) dictator to unanimous consent must be made in a constitutional setting and this setting must be sensitive to the type of issue the voting procedure is going to be applied to.

## 2.4 Random Decision Mechanisms

In recent years, scholars have begun to reconsider the merits of the Athenian practice of "sortition", which is the random selection of candidates from a larger pool of potential candidates (Buchstein, 2009; Stone, 2007). The logic behind this procedure originates from the worry that power corrupts over time. To assign individuals to political positions by lot guarantees that every candidate has a fair chance to be chosen. Since modern democracies are often perceived as intransparent in the recruitment of political personnel, Buchstein (2009) and others argue that lotteries present a fair mechanism to select political personal. Stone (2007) follows this argument and adds that lotteries are especially fit to deliver distributive justice. Saunders (2010) points out that lottery voting might be preferable in contexts in which minorities otherwise would have to fear that their preferences will not be recognized.

*This means that those who win or lose on one decision have no grounds to assume that they will be in the same position on the next occasion, since they may find themselves in either a majority or a minority on any given issue. This condition is not satisfied when there is a permanent minority, whose preferences differ from those of the majority. Members of such a group know, in advance of any given vote, that they will be outnumbered and therefore lose (p. 156).*

Even though the use of a lottery to aggregate individual preferences in order to find a group decision appears awkward from the perspective of normative political theory, empirical evidence largely confirms that the voters appreciate its 'fairness' property (Bolton et al., 2005; Anand, 2001). In an experimental study, Tammi (2011) find that both a random selection mechanism, and a majority voting mechanism are considered fair by participants in an exclusion game. Frey and Oberholzer-Gee (1997), for example, present survey evidence that lotteries are seen as an acceptable procedure to find locations for nuclear waste facilities (Bolton et al., 2005, p. 1056). In trying to explain this result, they suggest that random decision mechanisms are often perceived as 'the embodiment of fair allocation procedure', as none of the personal characteristics that typically interfere with the political decision processes matters (Frey and Oberholzer-Gee, 1997).

## 2.5 Theoretical Expectations

In this study, we explore the effect of three electoral rules on the acceptance of redistributive taxation; namely majority, unanimous consent and random dictatorship. Anderson and Guillory (1997) demonstrated that institutions condition the size of the gap in satisfaction between winners and losers, with relative satisfaction levels among winners being higher in majoritarian systems (Singh, 2014). The electoral rule majority also serves as a point of reference, as it comes with medium sized "external" and "decision-time costs". In terms of the "winner-loser gap" literature, however, the majority rule amplifies the distribution conflict and is expected to create a strong negative reaction by those who lost the election. The electoral rule consensus, on the other hand, endows each group member with a veto position. This means that the net payers of redistribution have a chance to defend themselves from the "exploitation" by the needy. In terms of Buchanan and Tullock (1962, Ch. 6), this voting procedure combines zero "external" and maximum "decision-time" costs. The opposite applies to the random dictator procedure.

To measure the acceptance of the implemented tax rate, we differentiate two types of response (Levi et al., 2009): "value-based legitimacy" and "behavioral legitimacy". One opportunity to express the perceived illegitimacy of the re-distributional outcome is to avoid taxes or to reduce performance. For the purpose of this study, tax evasion is not allowed. The remaining way to express lack of acceptance is through attitudes and reduction of performance. In theorizing the effect of the voting procedure on the acceptance of the of the implemented tax rate, we therefore distinguish between its effect on overall acceptance, regardless of whether one has been a net payer or beneficiary of redistribution and more specifically its effect on losers' acceptance of the implemented tax rate.

Table 1: Theoretical Expectations

Voting procedure	Acceptance	
	Satisfaction	Effort reduction
Majority	+ / -	+ / -
Unanimous consent	+	+
Lottery	-	-

## 3 Experimental Design and Procedure

The experimental sessions were conducted at the University of Hamburg. A total of 180 subjects participated in the study. The experiments took place in the computer laboratory using the experimental software z-Tree (Fischbacher, 2007). All sessions were conducted by the same experimenter following exactly the same procedures for every session: At the beginning of each session, after randomly handing

out place cards, the experimenter read instructions<sup>2</sup> out loud and answered questions. At the end of each session, subjects were individually paid in private and in cash. Subjects earned approximately 16 € (18.2 \$) on average and sessions lasted approximately 90 minutes.

The experimental design consists of three treatments, that are only differentiated by the implemented voting mechanism. Figure 2 displays the number of participants for each treatment.

Table 2: Overview Treatments

Treatments	Subjects	Rounds	Observations
Majority	60	5	300
Consensus	60	5	300
Lottery (Random Dictator)	60	5	300
Overall	180		900

### 3.1 Experimental Vehicle

In each of five rounds total, subjects were randomly assigned into groups of five. The experiment consisted of the following stages:

1. *Real effort task.* At the beginning of every period, subjects earned a primary endowment by counting numbers in a sequence of numbers and capital letters. The frequency of numbers varied between 1 and 20 and every correctly solved counting task was rewarded with a fixed wage of three cents.
2. *Communication and decision.* In the communication stage, subjects were allowed to exchange seven fixed number proposals (0%, 30%, 70% and 100%) to agree on a tax rate. After the seventh proposal, subjects were to enter a final vote for a redistributing tax rate. Quorum varied depending on the treatment, with at least three same votes in the majority treatment and 5 corresponding votes in the consensus treatment.

The dictator treatment did not include a communication phase. Instead, every group member independently entered a preferred tax rate. After every group member made her decision, one of five votes was randomly chosen to be implemented, with every vote having the same chance of being chosen.

To ensure perfect information about consequences of a possible tax rate, subjects were equipped with a calculator that displayed the profit of each group member before and after redistribution.

3. *Information and measurement of satisfaction.* After all votes were cast, subjects were informed on the result of the election. We measured satisfaction by asking how satisfied a subject is on a ten-graded scale from zero (= very unsatisfied) to ten (= very satisfied).
4. *Second real effort.* Subjects now participated in the real effort task for a second time. It was made clear that the group's tax rate would be applied to the second working stage. The period's profit resulted from the sum of both real effort tasks after redistribution using the groups tax rate.

After the fifth period, subjects completed a questionnaire consisting of questions on their political attitudes, socio-demographic background, (age, gender) and field of study. Subjects' partisan orientation is measured on a 1 to 10 scale, where 1 represents extreme right-wing orientation and 10 represents an extreme left-wing orientation.

<sup>2</sup>See appendix A

Subjects were recruited from the University of Hamburg using the software HROOT (Bock et al., 2014). Using a between-subjects design, 60 subjects decided under majority condition, 55 subjects decided consensually, and 60 subjects played in the dictator treatment. With 175 subjects in total and 5 rounds per subject, the dataset contains 850 individual observations. Full documentation of the written instructions and the treatment can be found in the appendix.

The multivariate regression analysis focuses on two dependent variables; subjects' satisfaction with the group choice, and subjects' change in effort between the first and second real effort task. Multilevel mixed-effects linear regression with robust standard errors fitted via maximum likelihood is used to estimate the effect of the voting mechanism on subjects' working motivation.

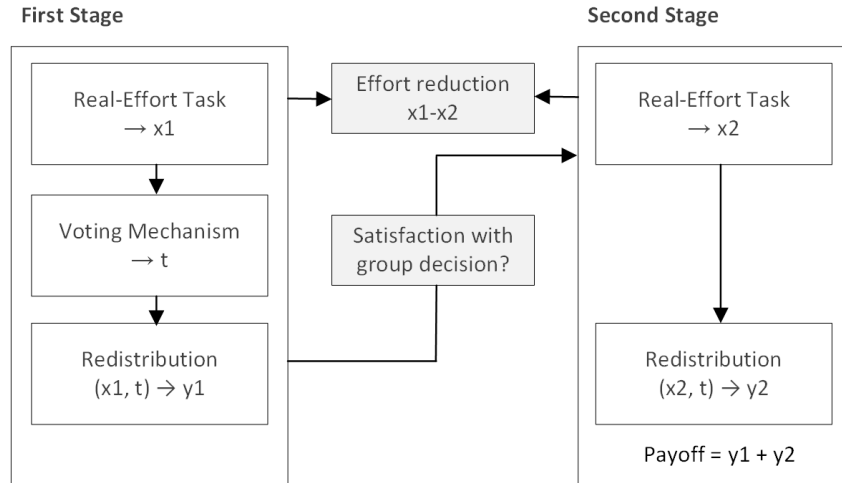


Figure 1: Experimental Design

### 3.2 Data and Methods

We use two dependent variables to measure subjects' acceptance of the group decision. First, a subject's satisfaction with the group decision is measured on a 10-scale attitude scale ranging from 0 unhappy to 10 fully happy. The second dependent variable measures each subject's acceptance in terms of performance in the real effort task before and after the group decision. The variable is defined as effort in the first real effort task minus effort in the second task. Thus, positive values represent a decrease in effort, negative values and increase in effort and a zero represents an identical performance in the first and second real effort task.

The treatment condition is measured with a set of dummies, in which unanimous consent serves as the reference category. To measure whether a subject considered themselves as winner or loser of the electoral process, we measure the difference between subject's ideally preferred tax rate and the group decisions. Drawing on the "winner-loser gap" literature, we do not look at the difference between a subject's rational prediction (according to the MR model) and the group decisions, but rather on the difference between subjects' ideal tax rate and the final group decision. Before entering the group communication stage, each subject was asked to enter their personally preferred tax rate. Thus, we are able to measure the deviation between subjects' ideal tax rate and the final group decision. Since the direction of the deviation matters, we chose to create a categorical variable, where "Ideal<Group" stands for the subject's ideally preferred tax rate is lower than the group decision, "Ideal=Group" stands for the case in which the ideally preferred tax rate and the group decision are identical, and "Ideal>Group" stands for the case in which the ideally preferred tax rate is higher than the group decision. The case in which the ideally preferred tax rate and the group decision are identical serves as the reference category.

In order to account for subjects' monetary loss resp. gain from the implemented tax rate, each



regression model includes a measure of whether subjects were net winners or losers of the implemented group decision tax rate after the first real effort task. This variable is defined as a subject's gross income minus net income from the first real effort task. Thus, positive values represent a net income loss through redistribution, negative values represent an increase in net income through redistribution, and zero represents the case in which the subject's gross and net income were not changed through redistribution. In addition, each model accounts for subjects age, gender and field of study.

## 4 Empirical Results

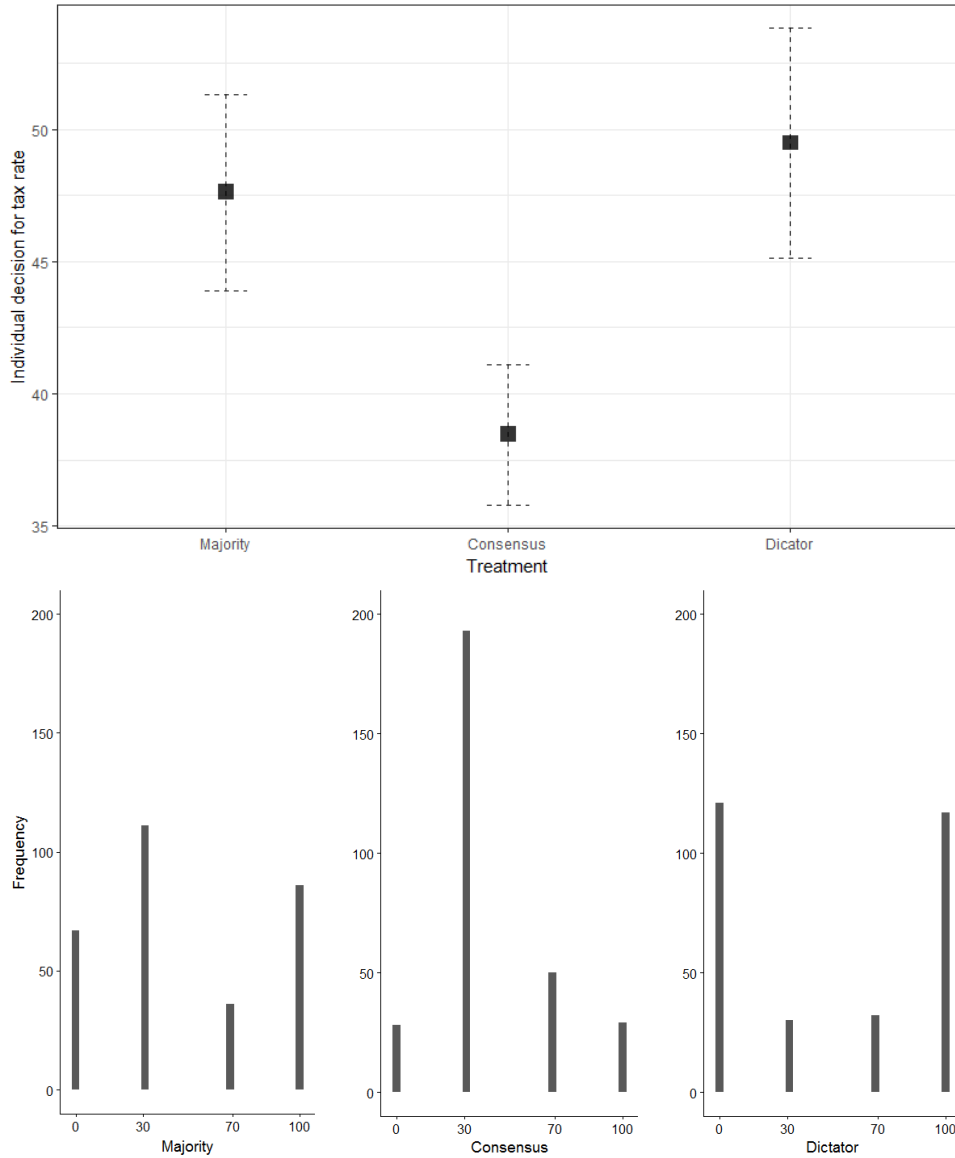


Figure 2: Average tax rate over treatments (top) and distribution of tax rates (bottom).

To begin with, we will take a quick look at the effect of the voting procedure on the tax rate. The average tax rate is 48.16% in the majority rule treatment, 40.63% in the consensus treatment, and 49.46% in the random dictator treatment. While at first glance these averages suggest that the voting procedure has no effect on subjects' vote choice, a look at the distribution of tax choices shows the opposite (Figure 2). Votes cast in the majority treatment are more equally distributed. In the consensus treatment, a 30% tax rate has the highest frequency and in the random dictator treatment either 0% or 100% have the

highest frequency. These frequencies are rather consistent with the different incentives induced by the electoral procedure.

Table 3: Determinants of satisfaction and effort reduction

	Model 1	Model 2	Model 3	Model 4
	Satisfaction	Satisfaction	Effort reduction	Effort reduction
Majority	-0.751*** [0.00]	-0.137 [0.71]	-0.438 [0.37]	-0.875 [0.21]
Dictator	-0.654*** [0.00]	0.238 [0.58]	-0.254 [0.59]	-0.479 [0.44]
Ideal<Group	-1.396*** [0.00]	-0.817** [0.05]	-0.41 [0.33]	-1.504** [0.02]
Ideal>Group	-2.520*** [0.00]	-1.599*** [0.00]	-1.370*** [0.00]	-0.957* [0.10]
Majority × Ideal<Group		-0.598 [0.28]		1.292 [0.17]
Majority × Ideal>Group		-1.287** [0.02]		0.068 [0.94]
Dictator × Ideal<Group		-1.099* [0.07]		1.673 [0.13]
Dictator × Ideal>Group		-1.464** [0.01]		-1.28 [0.12]
Satisfaction			0.055 [0.40]	0.0549 [0.40]
Net lost	-0.0931*** [0.00]	-0.0898*** [0.00]	0.143*** [0.00]	0.144*** [0.00]
Duration		-0.002 [0.297]		.002 [0.675]
Age	-0.0331** [0.04]	-0.0318* [0.05]	-0.00945 [0.84]	-0.00101 [0.98]
Female	-0.479*** [0.00]	-0.464*** [0.00]	1.095*** [0.00]	1.009*** [0.01]
Natural sciences	-0.23 [0.38]	-0.205 [0.44]	1.106 [0.20]	1.118 [0.20]
Social sciences	0.0958 [0.66]	0.0416 [0.85]	0.858 [0.15]	0.788 [0.19]
Arts and Humanities	0.288 [0.37]	0.242 [0.45]	0.873 [0.32]	0.869 [0.31]
Business sciences	0.108 [0.59]	0.118 [0.56]	0.395 [0.47]	0.423 [0.43]
Period 2	0.232 [0.40]	0.181 [0.52]	3.102*** [0.00]	3.139*** [0.00]
Period 3	0.439 [0.13]	0.386 [0.19]	3.767*** [0.00]	3.743*** [0.00]
Period 4	0.35 [0.23]	0.326 [0.26]	3.750*** [0.00]	3.818*** [0.00]
Period 5	0.159 [0.57]	0.0906 [0.74]	2.955*** [0.00]	2.907*** [0.00]
Constant	2.758*** [0.00]	2.227*** [0.00]	-3.483** [0.02]	-3.406** [0.02]
Observations	850	850	850	850
R2 w.	0.401	0.4	0.237	0.245
R2 o.	0.289	0.297	0.169	0.178
R2 b.	0.0543	0.0549	0.071	0.0832

*Table notes.* Multilevel random-effects linear regression with robust standard-errors fitted via maximum likelihood. Dependent variable: Satisfaction with group decision [0,10] (Model 1 & 2); effort decrease to second real-effort task (Model 3 & 4); p-values in brackets. \* $p \leq 0.1$ , \*\* $p \leq 0.05$ , \*\*\* $p \leq 0.01$ .

Table 3 reports estimation results from a series of random effect models. Models 1 and 2 measure

satisfaction with the group’s decision as dependent variable. Models 3 and 4 measure subjects’ effort reduction as dependent variable. Model 1 shows that the voting procedure is a significant explaining variable for subjects’ satisfaction with the electoral outcome. Both the majority and the random dictator treatment have a negative effect on satisfaction. Subjects’ satisfaction with the electoral outcome also decreases if the final group decision deviates from their ideally preferred tax rate. Finally, Model 1 shows that monetary loss affects subjects’ satisfaction with the electoral outcome. The more subjects lose from redistributive taxation, the lower is their subjective satisfaction.

Things change if we look at the determinants of subjects effort reduction (Model 3). Consistent with previous findings on satisfaction, we find that subjects who lose from redistribute taxation (net loser) will reduce their effort in the next round. The voting procedure, however, has no effect on subjects effort. Deviations between subjects’ ideally preferred tax rate and the group decision are even associated with an effort increase. This counter-intuitive finding might relate to a change in subjects strategy to maximize income. If maximization by voting for a high tax rate is not possible, the remaining option to maximize income is higher effort. Moreover, Model 3 show that subjects satisfaction with the electoral outcome does not predict their effort behavior. Thus, in term of acceptance, there is a gap between subjects’ attitudinal and behavioral response to the electoral outcome.

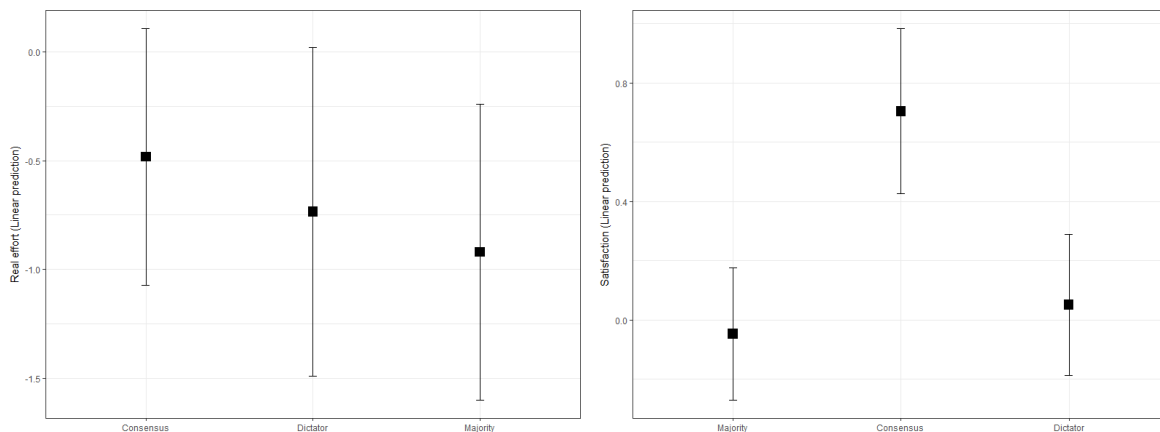


Figure 3: Treatment effect

Figure 3 reports predicted values for effort reduction (left) and satisfaction (right) obtained from Models 1 and 3 (see Table 3). Again, we cannot report a significant effect of the voting procedure on subjects’ effort reduction. However, the voting procedure exerts a significant effect on subjects’ satisfaction with the group decision.

Models 2 and 4 explore how the effect of losing, measured as the deviation between the group decision and the ideally preferred tax rate, conditions the effect of the voting procedure on subjects’ satisfaction with the electoral outcome (Model 2) and effort reduction (Model 4). While, again, there is no effect on subjects’ effort, Model 2 indicates that losers’ acceptance of the implemented tax rate is significantly higher in the treatment unanimous consent compared to majority voting and a random dictator.

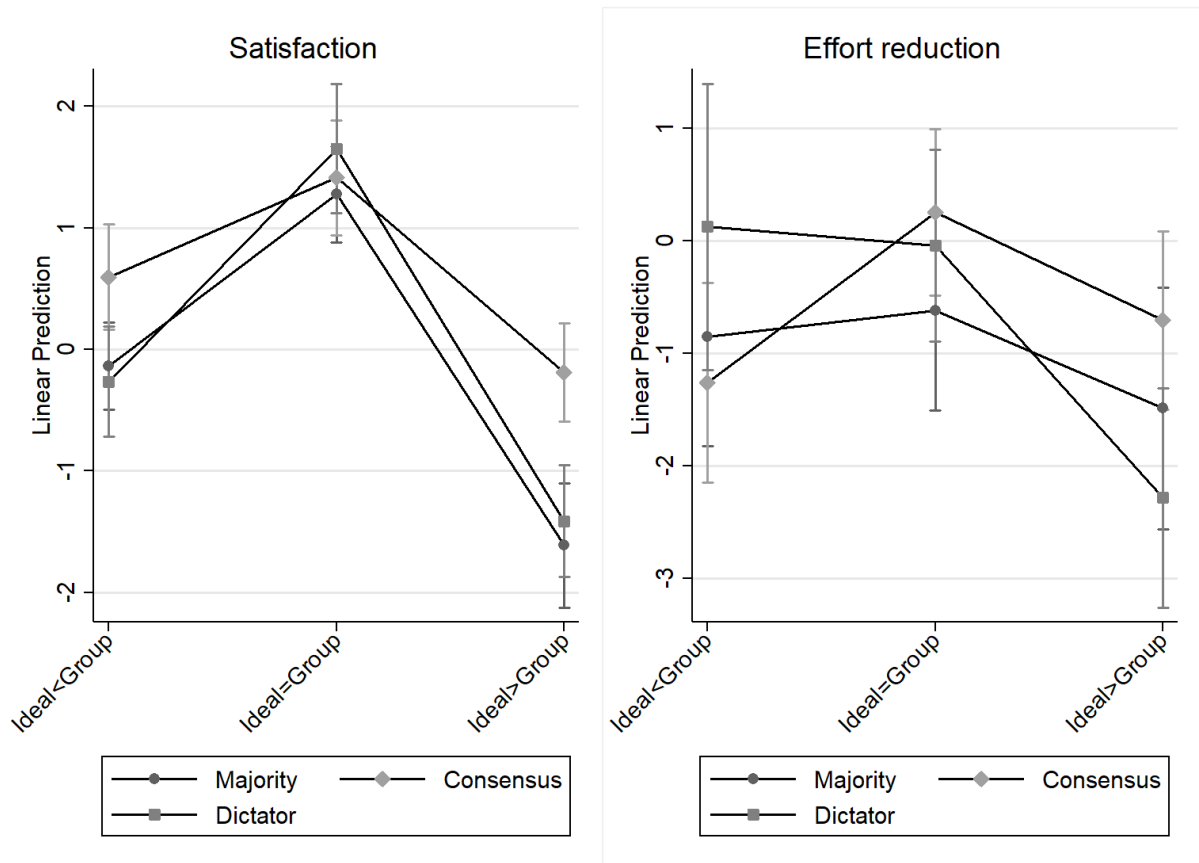


Figure 4: Conditional treatment effect

## 5 Discussion and Conclusions

In theoretical terms, this study contributes to the “winner–loser gap” literature (Anderson et al., 2005; Anderson and Guillory, 1997) by testing the effect of the voting procedure on losers’ consent in the context of the MR model. To test the effect of the voting procedure – majority rule, unanimous consent and random dictator – on subjects’ acceptance of the implemented tax rate, we designed a two-stage real effort laboratory experiment. In the first stage, subjects earn their endowment through a real effort task and vote on a tax rate. In the second stage, subjects do the same real effort task again. While keeping the redistribution mechanism constant (proportional taxation), we test the effect of three different voting procedures on subjects’ acceptance of the linear tax rate. Subjects’ acceptance of the linear tax rate is measured in two ways; first, in terms of subjective satisfaction and second in terms of effort reduction between the first and the second real-effort task.

Experimental results can be summarized in three points: First, unanimous consent exerts both a direct and indirect positive effect on subjects’ satisfaction with the group decision. Subjective acceptance of the implemented tax rate is significantly higher in the treatment with unanimous consent compared to the majority and random dictator. This is also true for those who were electoral losers. Subjective acceptance of the implemented tax rate among the electoral losers is significantly higher in the treatment unanimous consent compared to the majority rule and random dictator treatment. Second, none of the treatment conditions exert a direct or indirect effect on the subjects’ effort. These results are surprising. Even though the experimental data shows that the net payers of redistribution lower their effort, this effect is not conditional on the voting procedure. Moreover, subjects’ satisfaction with the electoral result does not affect their effort in the second stage. All in all, these findings suggest that subjects are rather sensitive towards being an electoral loser, although these negative feelings do not affect their work effort.

This preliminary study is certainly limited in various ways. Future research might aim to repeat the second stage of the experiment over a longer period of time to explore whether subjects' effort levels change. Another point of criticism concerns the appropriate measurement of "decision time" costs. In our experimental design, subjects were restricted to finding a majority or consensus in seven communication inputs. Even though there was no time restriction within these seven communication inputs, they induce a certain priming to find an agreement in certain amount of time. Future research therefore might allow for an unlimited number of communication stages to get a better measure of 'decision time' costs.

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## Appendix

	Obs.	Mean	Std. Dev.	Min	Max
<b>Dependent Vars.</b>					
Satisfaction	900	5.98	3.76	0	10
Effort decrease	900	1.2	9.67	-26	56
<b>Treatment indicators</b>					
Majority [0,1]	900	0.33	0.47	0	1
Dictator [0,1]	900	0.33	0.47	0	1
<b>Economic predictors</b>					
Net lost	900	2.83	16.83	-51.6	84
Ideal	900	52.94	49.74	0	100
<b>Controls</b>					
Age	900	25.24	4.63	19	44
Female	900	0.54	0.5	0	1
Natural sciences	900	1.3	0.34	0	1
Social sciences	900	1.3	0.34	0	1
Languages	900	0.05	0.34	0	1
Business studies	900	0.41	0.34	0	1
Other	900	0.26	0.34	0	1

Table 4: Descriptive



# A Instructions

Welcome and thank you for your participation in this experiment!

## **Briefing/Instructions**

The goal of this experiment is the study of decision making. You and your fellow participants will be tasked with making decisions over the course of this experiment. Your decisions, and those of the other participants, will influence your accumulated payment according to the rules explained on the following pages. The briefing is to serve as an explanation and introduction into the structure of the experiment and the consequences your decisions will have. The experimenter is not withholding or altering any information.

## **Payment**

Over the course of the experiment you will earn your payment. You will receive your payment without it being revealed to the other participants, and in cash.

## **Duration**

The entire experiment will take approximately 75 minutes. After you have completed the tasks, a questionnaire will appear on your screen. Following your completion of this questionnaire, you will have to wait until your seat number is called. You will then receive your payment in Euro.

Please take enough time to read the instructions and to come to your decision. You cannot speed up the process of the experiment by completing your tasks faster, as the completion by all participants is required to proceed.

## **Anonymity**

All participants will not know the identity of the others participating, neither during, nor after the experiment. The other participants will also not be informed of how much you have earned, neither during, nor after the experiment.

## **Ban on communication**

Throughout the entire experiment you are not allowed to communicate with other participants. Please also shut off any mobile devices. Furthermore, we would like to indicate that you are only allowed to use those functions on the computer that are required for the experiment. Violation of these rules will lead to expulsion from the experiment.

If you have any questions regarding the experiment after reading this briefing, please raise your hand. One of the experimenters will come to you and answer your question in private.

## **Content and procedure**

The experiment consists of five rounds with 2 stages each.

### **Stage 1**

In the first stage of the experiment, you are first tasked with counting the amount of numbers hidden in a row containing capital letters and numbers (see figure 1). For this stage of the experiment, you have 3 minutes (180 seconds) at your disposal. In this time, you can complete as many of the letter and number rows as you are able.

Figure 1: Counting tasks

The amount of correct inputs after 3 minutes will be converted into Euros. Each correct answer will be rewarded with 3 cent.

### **Redistribution mechanism**

Following the counting tasks, you will be tasked with redistributing your earned income among the group (including yourself). The redistribution will be done using a percental tax rate. Each group member enters their preferred tax rate into the input window.

Figure 2: decision game

After the group members input their preferred preference, their income endowment will be taxed using the percental tax rate. The resulting tax will be put into a communal pot. The money in the pot will then be distributed evenly among the group members.

The agreed upon tax rate can be any value between 0% (meaning no redistribution takes place) and 100% (meaning everyone receives the same).

You have a calculator you can use to assist you in your decision and see what your payout in eurocent will look like using a certain tax rate. You can input as many tax rates as you like into the calculator before making your final decision in the input box.

### **Decision-making mechanism**

Before you can communicate with your group about your preferred tax rate, you will be asked to input your ideal redistribution tax (meaning which tax rate you would implement if you could decide on your own). This input will not be shown to the other group members.

The decision-making process for the group will take place following the input of your ideal tax rate. All group members must agree on a tax rate for that tax rate to be applied to the group. To find one tax rate all group members can agree on, each member can input a tax rate to suggest to the others. Each group member has to get input 7 suggestions before the final decision can be made.

The suggestions from each group member (including yours) appear on your screen. This way you can see what tax rate your group members prefer. These suggestions are, however, not binding. They are only suggestions. A tax rate can only be agreed upon when all group members input the same tax rate as their final decision.

After your first input, your suggestion will appear on the screen of every member of your group. This way, each group member can suggest 7 tax rates, after which they will be asked to input their final decision.

If the members of a group cannot agree on a tax rate, no redistribution takes place. Instead, each group member loses half their endowment for that round, and they will not be permitted to take part in the second

stage.

**Stage two:**

In the second stage, you are once again able to earn an endowment. For this, you are once again tasked with completing the counting task elaborated above. You once again have 180 seconds to complete as many of these tasks as you are able, and are rewarded with 3 cents for each correctly completed task.

Your income from this stage will also be taxed with the tax rate decided on in the previous stage. Meaning that your income from this stage will also have a certain percent removed and put into a communal pot. The money in the pot will then be equally distributed among your group members. There is no new vote for a tax rate in the second stage.

At the end of the second stage, you will be shown your income before and after redistribution from both stages. Your pay for each round is composed of the income after redistribution from both stages.

**Begin of the next round**

A new round will begin after all participants have completed both stages. At the begin of this new round, all participants will be shuffled into new groups of five. This procedure will be repeated a total of five times, meaning that the experiment consists of five rounds.

**Calculation of your payment:**

After all 5 rounds have been played, you will be presented with an overview of the decisions made in each of your 5 groups. This overview shows you how much you earned after the redistribution took place.

Your payment for this experiment will be your income from all 5 rounds summed up. Each round is therefore relevant for your payment.

The payment will take place right after the experiment and will be anonymous.

**The experiment will begin shortly!**

*If you have any questions, please raise your hand until someone comes to speak to you.*

**Thank you and have fun.**

Welcome and thank you for your participation in this experiment!

### **Briefing/Instructions**

The goal of this experiment is the study of decision making. You and your fellow participants will be tasked with making decisions over the course of this experiment. Your decisions, and those of the other participants, will influence your accumulated payment according to the rules explained on the following pages. The briefing is to serve as an explanation and introduction into the structure of the experiment and the consequences your decisions will have. The experimenter is not withholding or altering any information.

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Please take enough time to read the instructions and to come to your decision. You cannot speed up the process of the experiment by completing your tasks faster, as the completion by all participants is required to proceed.

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Figure 1: Counting tasks

The amount of correct inputs after 3 minutes will be converted into Euros. Each correct answer will be rewarded with 3 cent.

### **Redistribution mechanism**

Following the counting tasks, you will be tasked with redistributing your earned income among the group (including yourself). The redistribution will be done using a percental tax rate.

Figure 2: decision game

After a randomly chosen decider decides on a tax rate, this tax rate will be applied to the endowments of the entire five-person group. The so collected tax is put into a communal pot. The money in this pot will then be distributed equally among the group members.

The agreed upon tax rate can be any value between 0% (meaning no redistribution takes place) and 100% (meaning everyone receives the same).

You have a calculator you can use to assist you in your decision and see what your payout in eurocent will look like using a certain tax rate. You can input as many tax rates as you like into the calculator before making your final decision in the input box.

Every group member has the same chance to be chosen as the decider for the group. Every group member decides on a tax rate they would apply to the group. The group only finds out which tax rate will be applied to their income at the end of the first stage.

### **Decision-making mechanism**

Before a tax rate is chosen, you will be asked to input your ideal redistribution tax (meaning which tax rate you would implement if you could decide on your own). This input will not be shown to the other group members.

Following this question, you may input your preferred tax rate.

### **Stage two:**

In the second stage, you are once again able to earn an endowment. For this, you are once again tasked with completing the counting task elaborated above. You once again have 180 seconds to complete as many of these tasks as you are able, and are rewarded with 3 cents for each correctly completed task.

Your income from this stage will also be taxed with the tax rate decided on in the previous stage. Meaning that your income from this stage will also have a certain percent removed and put into a communal pot. The money in the pot will then be equally distributed among your group members. There is no new vote for a tax

rate in the second stage.

AT the end of the second stage, you will be shown your income before and after redistribution from both stages. Your pay for each round is composed of the income after redistribution from both stages.

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A new round will begin after all participants have completed both stages. At the begin of this new round, all participants will be shuffled into new groups of five. This procedure will be repeated a total of five times, meaning that the experiment consists of five rounds.

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Your payment for this experiment will be your income from all 5 rounds summed up. Each round is therefore relevant for your payment.

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**The experiment will begin shortly!**

*If you have any questions, please raise your hand until someone comes to speak to you.*

**Thank you and have fun.**

# DFG Research Group 2104

## – Latest Contributions

### 2017:

Neuhofer, Sabine, Paetzel, Fabian, Schwaninger, Manuel and Traub, Stefan: Recognition of needs in a dictator game: Experimental evidence on information-sensitive giving behavior. Working Paper Nr. 2017-10. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-10.pdf>

Chugunova, Marina, Luhan, Wolfgang and Nicklisch, Andreas: When to Leave the Carrots for the Sticks: On the Evolution of Sanctioning Institutions in Open Communities. Working Paper Nr. 2017-09. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-09.pdf>

Tepe, Markus, Lutz, Maximilian, Paetzel, Fabian and Lorenz, Jan: Leaky bucket in the lab. The effect of system inefficiency on voting on redistribution. Working Paper Nr. 2017-08. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-08.pdf>

Pritzlaff-Scheele, Tanja and Zauchner, Patricia: Meeting Needs. An Experimental Study on Need-Based Justice and Inequality. Working Paper Nr. 2017-07. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-07.pdf>

Paetzel, Fabian, Lorenz, Jan and Tepe, Markus: Transparency diminishes framing-effects in voting on redistribution: Some experimental evidence. Working Paper Nr. 2017-06. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-06.pdf>

Schwaninger, Manuel, Neuhofer, Sabine and Kittel, Bernhard: Offers Beyond the Negotiating Dyad: Including the Excluded in a Network Exchange Experiment. Working Paper Nr. 2017-05. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-05.pdf>

Kittel, Bernhard, Neuhofer, Sabine and Schwaninger, Manuel: Need-based Justice in Social Exchange Networks. Working Paper Nr. 2017-04. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-04.pdf>

Diederich, Adele and Wyszynski, Marc: Need, framing, and time constraints in risky decision making. Working Paper Nr. 2017-03. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-03.pdf>

Kittel, Bernhard, Kanitsar, Georg and Traub, Stefan: Knowledge, Power, and Self-interest. Working Paper Nr. 2017-02. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-02.pdf>

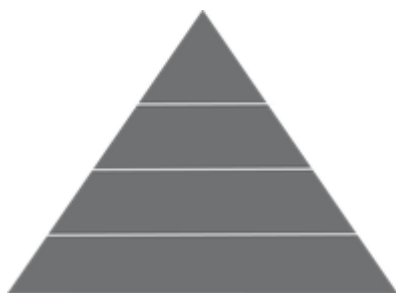
Traub, Stefan and Krügel, Jan Philipp: Risk Taking and the Welfare State: Some Experimental Evidence. Working Paper Nr. 2017-01. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-01.pdf>

### 2016:

Guo, Lisa, Trueblood, Jennifer S. and Diederich, Adele: Thinking Fast Increases Framing Effects in Risky Decision-making. Working Paper Nr. 2016-04. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-04.pdf>

Paetzel, Fabian and Sausgruber, Rupert: Entitlements and loyalty in groups: An experimental study. Working Paper Nr. 2016-03. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-03.pdf>

Nicklisch, Andreas, Grechenig, Kristoffel and Thöni, Christian: Information-sensitive Leviathans. Working Paper Nr. 2016-02. <http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-02.pdf>



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