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Procedural Satisfaction Matters - Procedural Fairness Does Not: An Experiment Studying the Effects of Procedural Judgments on Outcome Acceptance

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Abstract

By reporting data from a laboratory experiment, we provide clear evidence that people value procedures apart from their effects on consequences. We implement a game with one proposer who has distributive power over a pie and four responders who can invest in resistance against the proposer's demand. The proposer is appointed by the use of one of two feasible appointment procedures. We elicit participants' preferences and fairness evaluations over both procedures and study whether responders' resistance against various demands are affected by their procedural judgments.

Although the *fair process effect*, describing the finding that people are more likely to accept outcomes when they feel that they are made via fair procedures, is said to be exceedingly robust, we do not find support for any significant behavioral differences according to people's fairness evaluations. In contrast, we show that procedural satisfaction matters. Surprisingly, responders whose procedural preferences are satisfied offer significantly *more* resistance than those whose procedural preferences are violated.

JEL classification: C72, C91, J52, D23.

Keywords: experiment; fair process effect, frustration effect, procedural fairness; procedural preferences; resistance; threshold public good.

1 Introduction

One persistent finding in experimental economics is that not only outcomes but also procedures leading to them matter (e.g. Albert and Mertins (2008), Blount (1995), Bolton et al. (2005), Brandts et al. (2006), Charness and Levine (2007), Falk et al. (2008), Fukuno and Ohbuchi (2003)).[1] In particular, procedures seem to play an eminent role in workplace relations: Behavioral reactions to promotion decisions, bonus allocations or dismissals have been shown to significantly depend on the selection procedure. Thus, it seems to be a factual necessity – for organizations or any other institution – to respect the procedural preferences within a group. In particular, one may argue that a procedure needs to have at least some support within a group to ensure that people submit information and respect outcomes (Dietrich (2005), Dolan et al. (2007)). The latter aspect is the focus of our study.

Consider a group of employees which chooses a person among them to be the "team leader". With the selection, the team leader is given some de-

[1]Only recently, economists begun to investigate the role of procedures. In contrast, there is a broad consensus among other social scientists that people react differently to identical outcomes depending on the way in which decisions were taken, see e.g. Grimes (2006), Konovsky (2000), Thibaut and Walker (1975), Tyler (1990), Tyler and Lind (2000). Economists just started to theoretically address the issue of procedural concerns. Recent work includes Bolton et al. (2005), Krawczyk (2007) and Trautmann (2007). Sebald (2007) provides an game-theoretic framework that integrates procedural concerns into economic analysis. Empirical work on procedures include Bischoff et al. (2008) who show by analyzing representative survey data that procedural fairness plays an important role for the acceptance of a given income distribution.

gree of distributive power. Henceforth, she makes allocation decisions whose outcomes affect all group members.[2] Do team members judge allocations solely according to outcomes or do they consider the procedure that led to the selection of the team leader and thus in turn led to the allocation chosen by the team leader?[3]

Our research is closely related to the experimental study by Brandts et al. (2006). They tackle the question whether or not a selection procedure is able to change individuals' goodwill towards others in general and/or towards the selectors in particular. The authors presume that people may have a tendency to avoid the guilt that results from disappointing the expectations of others. Their first hypothesis posits that selected allocators are more generous towards others than random allocators ("I-want-YOU effect"). Their second hypothesis states that the selected party will favor the selecting party more than the third party involved ("gratitude effect"). There is some statistical evidence for both effects.[4] Albert et al. (2008) confirmed this finding within a different experimental framework. They show that proposers claim significantly less if responders' group preferences regarding proposer's ap-

[2]Another example are employees who choose among them their representatives and thus allow them to lobby. Beyond labor market relations, one might think of any democratic system in which citizens elect the government.

[3]Note that in many situations, people do not choose a procedure leading to an outcome but choose an allocator by an appointment procedure and thus give them some degree of distributive power.

[4]By using a Mann-Whitney test, the "I-want-YOU effect" is confirmed in the first round ($p = .043$), but not in the following rounds ($p = .089$ and $p = .48$). The same is true for the "gratitude effect" (round 1: $p = .042$, Wilcoxon signed-ranks test)

pointment procedure were satisfied than if they were violated ($p = .046$, Mann-Whitney test, one-sided). Both studies provide evidence that the selected party's (i.e. proposers') motivation is affected by selection. We pick up the topic by expanding their research question on the selecting party's (i.e. responders') behavior.

There exits by now a broad consensus that property rights induce fairness norms and are thereby crucial for any kind of outcome (Frey and Bohnet (1995), Sudgen (1986)). Proposers claim a share and responders accept or reject a proposed share according to their individual fairness norm. Typically, roles in bargaining experiments are assigned by a random procedure. In these cases, the strength of property rights seems to be accompanied by a fairness norm suggesting that all players have (more or less) the same right to a share, resulting in a high probability for 50:50 allocations. This normative right was shown to be altered by the introduction of effort to obtain the pie. Numerous studies provide evidence on this "entitlement effect". *Hoffman* and *Spitzer* (1985) and *Hoffman* et al. (1994), for example, show that when the role of the proposer was earned (e.g. by scoring high on a general knowledge quiz) rather than being randomly assigned proposers offer less and responders accept more unequal offers.

We argue that besides role allocation by chance or effort, there is a further variable deserving recognition: role assignment by a procedure judged right to use or fair. A growing literature in the social sciences indicates that people seem to care not only about outcomes themselves but also about how they emerged in the first place (for a review, see Mertins (2008)). We test whether individuals' procedural judgments affect their behavior. Responders'

demands may vary depending on whether proposers obtained their roles with or without responders' support.

Based on a simple experimental game, we shed light on these questions. One proposer faces four responders who can offer resistance against allocation proposals. Resistance is modeled as a threshold public good.[5] The public good "resistance" is provided if and only if the sum of voluntary contributions is greater than or equal to a specific threshold. In this case, the proposer gets nothing. We implement an experimental setting with two feasible appointment procedures (AP). These AP's appoint the role of the proposer and thus distributive power. We elicit participants preferences and fairness evaluations over both procedures. Then, we assign either the AP which is favored by a majority or not. Hence, the individual and group procedural preferences of responders may either be satisfied or violated. We consider different procedural aspects discussed in the literature: We investigate whether AP's themselves, fairness evaluations and procedural satisfaction have an effect on responders' willingness to offer resistance against various outcomes. By measuring people's resistance levels, we can identify their willingness to accept various outcomes.

First, we refer to the appointment procedures themselves. A number of studies provide evidence which allocative mechanisms are considered "acceptable" and which not. Stutzer and Frey (2005) quote some examples where random mechanisms were chosen because they were considered to be an adequate tool, e.g. the selection of persons to form a jury in criminal and

[5]The study of threshold public good games may be said to begin with the work of Marwell and Ames (1979) and Palfrey and Rosenthal (1984).

civil cases, or random mechanisms to select politicians and public officials in classical democracy in Athens. The authors propose the usage of random selection as a principle in international organizations in order to give every citizen an equal chance of being chosen. Surveys, however, show that a considerable number does not agree with the use of random mechanisms. Frey and Pommerehne (1993) report that raising prices to ration demand is considered to be fair by less voters than allocation by a "first come, first served" rule or allocation by an authority. Accordingly, Frey and Oberholzer-Gee (1996) report on people's unwillingness to accept any solutions where to site environmental hazards that include monetary values. Pommerehne et al. (1997) rank people's procedural preferences (in descending order): expert judgment, layperson judgment, allocation by lottery and an auction mechanism. We put two alternative mechanisms to the vote: (AP 1) allocation by an authority (the experimenter), and (AP 2) election. In the following, we try to assess which mechanism is favored and whether the allocated AP's themselves influence responders willingness to resist.

Second, we investigate the possible impact of procedural fairness evaluations. A critical finding in this line of research is the *fair process effect:* Outcomes from fair procedures are rather accepted than outcomes from unfair procedures, even if the outcomes themselves are viewed as unfair (Brockner and Wiesenfeld (1996), Greenberg and Folger (1983), Thibaut and Walker (1975), Tyler (1990), Tyler and Lind (2000)). Whereas the fair process effect is said to be extremely robust and one of the most frequently replicated findings in social psychology, there is still little experimental evidence with decisions having monetary consequences (for a survey, see Mertins (2008)).

An exception is Bolton et al. (2005) who show in an economic experiment that an unfair outcome chosen by a fair (i.e. unbiased) lottery is more acceptable than the same unfair outcome chosen by a third-party. We will test whether participants self-reported procedural fairness judgments on both AP's affect their willingness to offer resistance against various outcomes against the background of monetary consequences.

Third, we consider participants' satisfaction with an applied appointment procedure. Procedural fairness judgments and procedural satisfaction judgments have mostly been treated interchangeable as both concepts overlap to a great extent. However, there is empirical evidence that the two constructs do not always show the same effect (Van den Bos et al. (1998)). Our experimental setting is able to differentiate between effects resulting from either procedural fairness or procedural satisfaction judgments. That is, we test whether perceived procedural fairness and/or procedural satisfaction positively affects how people react to outcomes. To our knowledge, there is no experiment that has explicitly examined this issue before. It has been argued, e.g. by Ng (1988), and empirically shown (notably by Frey and colleagues) that the use of the preferred procedure directly yields utility. The latter propose the term "procedural utility" to denote people's utility provided if their preferences about the process as such are satisfied. Frey et al. (2004) measure utility by individuals' reported subjective well-being or happiness. Frey and Stutzer (2002) show that individuals obtain procedural utility, i.e., by having the mere opportunity to participate in the political decision-making process. Furthermore, it has been said that the way in which decisions are made can affect people's reactions to those decisions (Dolan et al. 2007). In particular,

it has been argued that a procedure needs to have at least some support within a group to ensure that people respect outcomes (Dietrich (2005)) or support even apparently unfavorable decision (Dolan et al. (2007)). This consideration is related to the literature on perceived legitimacy as the primary explanation for compliance. Tyler and Lind (2000) stat the so-called "legitimacy and deference hypothesis": People obey a decision if they regard the authority, who made the decision, as entitled to be obeyed, irrespective of their own judgment about the decision. We intend to examine the assumed causality: Do people rather comply with a decision (i.e. invest less in the public good resistance) if they support the underlying procedure? We state the formal hypotheses in the following section.

The remainder of the paper is organized as follows. Section 2 describes the experimental design and procedures. Section 3 states the behavioral hypotheses we intend to test. Section 4 presents experimental results. Section 5 provides some discussion and concludes.

2 The Experiment

2.1 The Basic Game

Consider the following game between five players, one proposer and four responders. Each responder has an initial endowment of $\frac{p}{4}$, where $p > 0$ (in chips) is the total experimental payoff at stake in the game. The proposer has no endowment. The proposer tells responders the tax, that is, the number $x \in [0, \frac{p}{4}]$ of chips she would like to get from each of them. If her proposal

goes through, she gets $4x$ while each responder keeps $\frac{p}{4} - x$. However, each responder i can pay $y_i \in [0, \frac{p}{4}]$ on a group account. Responders' decisions are simultaneous. Payments to the group account are lost to the group. If the amount on the group account reaches a threshold t with $p > t > \frac{p}{4}$, that is, if $\sum_i y_i \geq t$, the proposal is rejected, and each responder keeps $\frac{p}{4} - y_i$ while the proposer gets nothing. Note that no single responder can achieve rejection. If, however, the group account stays below the threshold t, each responder has to pay up to x to the proposer, depending on how much of his endowment is left, and the proposer gets up to $4x$, depending on whether responders can pay her in full or not. Thus, each responder pays $z_i := \min\{\frac{p}{4} - y_i, x\} \geq 0$ and keeps $\frac{p}{4} - y_i - z_i \geq 0$, while the proposer gets $\sum_i z_i \geq 0$.

Resistance is modeled as a threshold public good. The public good is provided if and only if the sum of voluntary contributions is greater than or equal to the cost of the public good t with t being the threshold. The value of a provided public good is x, which equals the proposed tax and is the same for all responders. As the public good is fixed-sized, contributions exceeding the threshold do not affect the level of provision. The applied decision rule is not simply a binary one as players can choose to contribute any integer $y_i \in [0, \frac{p}{4}]$. This reflects the idea that resistance in real world is seldom an all-or-nothing decision. People typically have more responses than either to accept or reject a decision or a claim, e.g. they can join a protest as instigators or mere supporters. Thus, different grades of participation, corresponding with different costs, are conceivable.

In the experiment, the group endowment was $p = 100$ chips, and the threshold was $t = \frac{p}{4} + 1 = 26$. The tax proposal was restricted to multiples

of five chips plus zero: $x \in \{0, 5, 10, 15, 20, 25\}$. Responders could choose any contribution $y_i \in \{0, 0.5, 1, 1.5, 2, ..., 24.5, 25\}$.

For the theoretical analysis, we consider only subgame perfect equilibria in pure strategies assuming that players maximize their own experimental payoffs. Under these assumptions, a subgame perfect equilibrium is a strategy profile $(x^*, y_1(x), y_2(x), y_3(x), y_4(x))$ with the following properties. First, $y_i(x) \leq x$, that is, no responders invests more in resistance than the tax proposal x, because x is the return of successful resistance. Second, $y_i(x) = 0$ for $x \leq 6.5$ because then the maximum collective investments are $4x < 26$, that is, resistance cannot be successful. Third, $\sum_i y_i(x) \in \{0, 26\}$ if $x \geq 6.5$, that is, whenever x is high enough for successful resistance, responders either coordinate on no resistance or on exactly the right amount of resistance because otherwise at least one responder could profit by reducing his investment unilaterally. Thus, for proposals $x \geq 6.5$, the game becomes a coordination game: there are many subgame perfect equilibria in pure strategies which compete against each other.

Given the responder strategies, the best response of the proposer is $x^* := \max\{x: \sum_i y_i(x) = 0\}$, that is, to select the highest value of x for which there is no resistance. Since $x \in \{0, 5, 10, 15, 20, 25\}$, it follows that $x^* = 5$. Note that $x = 5$ means equal division of the 100 chips among all five players if there is no resistance.

2.2 Experimental Design and Procedures

The game is explored by applying Selten's (1967) strategy method[6] for three reasons: First, we intend to acquire a maximum of data. Second, we aim at eliciting contingent decisions that cover the strategy space. Third, we expect that highly unfavorable claims could trigger strong emotional responses in a hot (i.e. emotional) environment, which we intend to avoid. The applied cool frame even strengthens the results offered.

Furthermore, the experimental design has the feature of asking subjects to decide in both roles (as proposer and as responder) before the participant's final role is determined. The purpose is not to connect behavior in both roles but to allow responders to have an idea of proposer's decision situation. However, we will solely focus on responders' behavior.

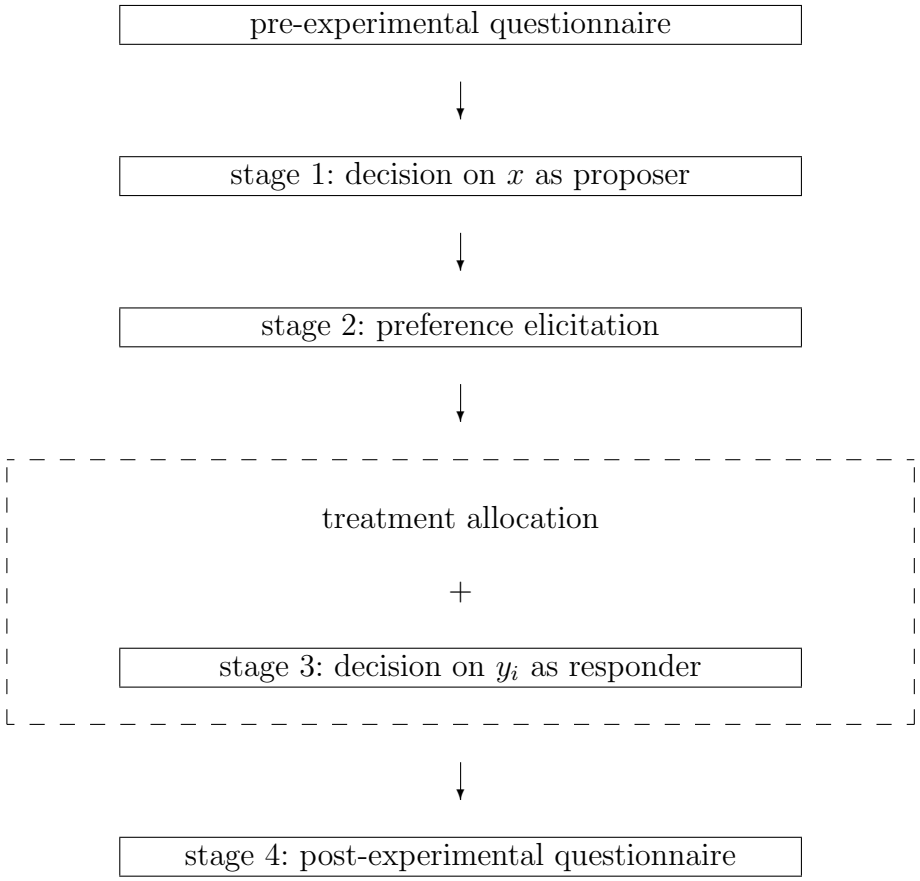
A total of 100 participants took part in the non-computerized experiment conducted at Saarland University.[7] The experiment took about 35 minutes and participants earned 4.47 Euro on average.

As indicated in figure 1, the experiment consisted of a pre-experimental

[6]By applying the strategy method, subjects are asked to submit entire strategies by stating what they do conditional on each of the proposers' choices prior to observing the proposers' actual choice.

[7]Session 1-3 with 55 subjects was conducted on 2nd July 2005 and session 4 and 5 with 45 subjects on 12th July 2005. In the former case, participants were visitors of the university's Open Day (most of them were prospective students), and in the latter case, participants were students from various fields. An Analysis of Variance (ANOVA) revealed that no significant differences in the behavior of students and non-students were observable ($p \geq .168$) and thus, data are pooled. We had 51% female participants. The average age was 23.2 with age ranging from 17 to 53 years.

Figure 1: Sequence of events



questionnaire, three decision stages and a post-experimental questionnaire.[8] Before running the (one-shot) experiment, each participant was asked to fill out a sign-up sheet[9] Thus, participants provided basic demographic information and indicated their average time spent in voluntary work. As part of our experimental design, we had to generate information about participants' age and social commitment. Their answers were used in a subsequent stage

[8]English instructions are given in appendix II. Original (German) instructions are available from the author upon request.

[9]The sign-up sheet is given in appendix I.

to allow voting for a specific group member (the oldest one or the one which volunteers most). Then, all participants were assembled in a large room and randomly assigned to a group of $n = 5$.

In stage one, all participants were asked to decide in the role of the proposer on how to allocate the group pie of $p = 100$ chips with the monetary value of 1 chip being 0.25 Euro. In the beginning, each responder i was given an initial endowment of 25 chips (6.25 Euro), whereas the proposer had nothing. The proposer proposed a tax $x \in \{0, 5, 10, 15, 20, 25\}$ to be paid by each responder.

In decision stage 2, participants were asked to consider two appointment procedures (AP) for the group's proposer:

- AP 1 (experimenter despotism): The experimenter appoints a proposer.
- AP 2 (majority vote): Group members appoint a proposer by majority vote.

AP 1 was in fact a random mechanism. We drew a lot to determine the proposer; participants, however, did not know this. AP 2 was more difficult to implement since anonymity had to be respected. We asked participants to vote for a criterion to determine the proposer. They had the choice between age (the oldest group member) and high engagement in student and voluntary activities (the one who spent most time per week on such activities). The relevant information was available from the pre-experimental questionnaire.

First, participants casted their vote for AP 1 or AP 2. Abstention was impossible. As each group consisted of five members, there was necessarily a majority—large (5:0), medium (4:1) or narrow (3:2)—in favor of one AP. In a

next step, participants gave reasons for their choice. Moreover, independently of their own preferences with respect to the AP, participants had to vote for one criterion, high age or high engagement, so that, in case of AP 2, a proposer could be chosen. Again, abstention was impossible. Furthermore, participants stated their opinion on the importance of the APs using a seven-point scale ranging from 1 (very important) to 7 (not important at all). Besides, participants ranked both APs on a seven point scale from 1 (very unfair) to 7 (very fair). When stage 2 was completed, we counted the votes and completed instructions for stage 3.

Instructions for decision stage 3 contained information about the results from stage 2. We told participants the preferences of their group, that is, the AP preferred by the majority and the size of the majority. We then told them whether the preference of the majority was respected (treatment M^+) or not (treatment M^-), and which AP, 1 or 2, had accordingly been used to appoint the proposer. For instance, a group may have voted 4:1 in favor of AP 2; participants were given this information together with the information that the will of the majority did not prevail and that, instead, AP 1 was used to appoint the proposer. Another group may have voted 3:2 in favor of AP 2; participants were given this information together with the information that the will of the majority prevailed and that we had determined the proposer according to the criterion preferred by the group. Half of the groups (50 participants) were randomly assigned to treatment M^+, the other half to treatment M^-. We applied a between-subject design where participants were not aware of the different treatments.

In stage 3, all participants were asked to decide as responders whether

or not offering resistance against any feasible allocation. Participants chose their contributions $y_i \in \{0, 0.5, 1, 1.5, ..., 25\}$ to the responders' group account for each $x \in \{0, 5, 10, 15, 20, 25\}$ the proposer might have chosen (strategy method). The instructions emphasized that these contingent contribution choices were binding and that one would be carried out depending on the actually proposed tax.

When all subjects have finished all three decision stages, completed decision forms were taken to another room to determine the roles according to the rules of the game and to calculate payments. While the calculations lasted, all subjects filled in a post-experimental questionnaire intended to check their understanding of the game.

2.3 Hypotheses

Each responder finds himself in one of four possible situations (see table 1 below): Individual AP preferences may be satisfied (situation I^+) or not (situation I^-), and group AP preferences –that is, the preference of the majority– may be satisfied (situation M^+) or not (situation M^-). These situations were determined partly by our treatment (M^+ versus M^-) and partly by the responder's preference in combination with our treatment (I^+ versus I^-).

Game-theoretic predictions of responders' behavior on the basis of egoistic or purely distributional social preferences do not differ between the four situations. Besides, neither the appointment procedure itself nor fairness assessments of it should affect responders' behavior. Thus, we state the fol-

Table 1: Responder situations

		individual preference	
		satisfied	not satisfied
group preference	satisfied	I^+M^+	I^-M^+
	not satisfied	I^+M^-	I^-M^-

lowing null hypothesis:

> H_0. *Responders' behavior is the same under any AP, any fairness evaluation of the applied AP and any treatment situation for any claim and claims altogether.*

The possibility that participants have procedural preferences, however, motivates different hypotheses. Specifically, we investigate the following behavioral hypotheses, which are suggested by the literature on procedural preferences discussed in the introduction and apply to any tax $x > 0$.

First, the appointment procedure itself may have an impact on responders' willingness to offer resistance against proposers' claims:

> H_1. *Responders' behavior differs between AP 1 and AP 2.*

Second, previous findings on procedural fairness suggest that individual procedural fairness evaluations play an important role in responders' willingness to accept or reject an offer by the selected party. In particular, the procedural fairness hypothesis states that outcomes from fair procedures are rather accepted than outcomes from unfair procedures, even if the outcomes itself are viewed as unfair. This yields the following directed hypothesis:

H_2. Responders offer less resistance if the procedure through which the proposer has been assigned distributive power is seen to be fairer (or at least as fair) as the other AP available (c.p.).

Third, we try to assess the impact of procedural satisfaction, an issues which has not attracted much attention – at least in the realm of experimental economics – yet. When arguing for procedural autonomy (i.e. group decisions should be taken on the ground of procedural judgments within the group), justification may be based on normative reasons as well as on the pragmatic argument that people would otherwise not accept outcomes. In the long-term, it has been argued, this could even generate major instability within the organization. The satisfaction of procedural preferences can possibly reduce negative reciprocity. Individuals may think it is right that their individual or group preferences are satisfied, and may react negatively if this is not the case. According to the legitimacy and deference hypothesis, responders are expected to obey a decision if they regard the proposer as entitled to be obeyed. Entitlement is assumed to be given if responders' procedural preferences are satisfied. These considerations result in the following hypotheses:

H_{3a} Responders offer less resistance if their individual preferences regarding the AP are satisfied than if they are not satisfied (c.p.).

H_{3b} Responders offer less resistance if their group preferences regarding the AP are satisfied than if they are not satisfied (c.p.). Moreover, the effect becomes stronger the larger the majority setting the group preference.

H_{3c} Responders offer least resistance if their individual and group preferences regarding the AP are satisfied (c.p.). Responders offer most resistance if they are both not satisfied (c.p.). Responders offer medium levels of resistance if either their individual or group preferences are satisfied (c.p.).

3 Experimental Results

Procedural preferences On the question whether AP 1 or AP 2 should by applied in their group, 64% voted for AP 1 (experimenter despotism) and 36% for AP 2 (majority vote). In case that AP 2 was applied, 42% advocated "age" as key criterion and 58% "engagement".

According to treatment variation rules, 50 participants (10 groups with 5 members each) get exactly the rule which the majority wants (M^+), and other 50 not (M^-). AP 1 is thus applied in 45 cases, and AP 2 is applied in 55 cases. The result of this assignment is that 51 participants decide under I^+, 49 participants decide under I^-. The frequency of each responder situation is given in table 2 below.[10]

Only 8% of all participants indicate that proposers' appointment procedure is of little or no importance (6 or 7 on a seven point scale). Importance attach 46% of all subjects (1 or 2). On a seven point scale with 7 meaning

[10] As group size is equal under $M^{+/-}$ and nearly equal under $I^{+/-}$, we will analyze these date by using ANOVA/ANCOVA. For the analysis of responder situations, where groups are extremely unequal, we refer to non-parametric test statistics like Mann-Whitney or Kruskal-Wallis.

Table 2: Participants n in each responder situation

	I^+M^+	I^+M^-	I^-M^+	I^-M^-
n	35	18	15	32

very fair, participants perceive AP 1 as fairer (median 5) than AP 2 (median 4). By defining the AP which received a higher fairness evaluation as "fair AP" and the other AP as "unfair AP", we find that 55 participant are assigned a fair AP (45 an unfair AP). All together, 87% choose those rule that they judge to be the fairer one (or the one which was seen as fair as the other). This means that only 13% choose exactly the other rule (mostly for selfish reasons according to their self-reported motivation). Answer frequencies to rule importance and rule fairness are given in table 3.

Allocated AP We test for potential differences in resistance levels depending on whether AP 1 or AP 2 is applied. Interestingly, we find no significant differences between mean resistance levels under both appointment procedures (see table 4). Thus, participants do not behave differently depending on the allocated appointment procedure for any $x \geq 5$ and for x altogether[11].

> **Regularity 1.** For any given value of x and for x altogether, contributions to the provision of the public good resistance do not differ significantly with respect to the allocated appointment procedure.

[11]Note that mean resistance levels labeled with *all* include any decision taken for $x \in \{5, 10, 15, 20, 25\}$.

Table 3: Answer frequencies (in %) to decision stage 1 questions

points	rule importance (1=very important) (7=very unimportant)	fairness AP 1 (1=very unfair) (7=very fair)	fairness AP 2 (1=very unfair) (7=very fair)
1	14	2	3
2	32	12	25
3	21	7	17
4	20	19	18
5	5	14	9
6	5	26	15
7	3	20	13

Procedural fairness We test whether individual procedural fairness evaluations influence responders' willingness to accept or reject a tax. According to the procedural fairness hypothesis, we expect responders to offer less resistance if the procedure through which the proposer has been assigned distributive power is seen to be fairer one.[12]

Indeed, we find that responders offer less resistance if the AP they deem fairer is used. This is true for any tax and overall tax claims. However, from the analysis of variance output (see table 5, we retain the overall null

[12]We define "fair AP" as the procedure which is deemed fairer (or at least as fair) as the other AP available according to questionnaire answers on a seven-point scale on AP fairness. The other procedure is called "not fair AP" and it describes the procedure which was seen to be less fair (lower scale value) than the other one.

Table 4: Responders' mean contributions to resistance for AP 1 vs. AP 2

x	AP 1	AP 2	difference[a]	p^b
5	.989	1.518	-0.529	.341
10	3.444	3.764	-0.320	.666
15	5.822	5.127	0.695	.247
20	7.067	6.427	0.640	.402
25	7.633	7.318	0.315	.728
all	4.991	4.831	0.160	.672

[a]first column minus second column
[b]single-factor ANOVA, two-sided

hypothesis of equal population means in group "fair AP" and "not fair AP".

> **Regularity 2.** For any given value of x and for x altogether, contributions to the provision of the public good resistance do not differ significantly with respect to the individual fairness judgment on the allocated appointment procedure. However, responders offer less resistance against any tax x and for x altogether if a fair procedure has been allocated to them.

Individual preference satisfaction According to hypothesis H3a, we expect responders to offer less resistance if their individual procedural preferences are satisfied. However, we find that the opposite is true for any x: mean contributions y to resistance are lower in situations I^- as compared with I^+ (see columns 2 and 3 of table 6 below). Thus we should reject H3a.

Table 5: Responders' mean contributions to resistance according to procedural fairness evaluations

x	fair AP	not fair AP	difference[a]	p^b
5	.982	1.644	-0.662	.117
10	3.573	3.678	-0.105	.444
15	5.355	5.544	-0.189	.376
20	6.473	7.011	-0.538	.240
25	7.245	7.722	-0.477	.300
all	4.725	5.120	-0.395	.149

[a]first column minus second column
[b]single-factor ANOVA, one-sided

However, to detect *any* regularity underlying responders' behavior, we test the alternative hypothesis whether mean resistance levels are significantly higher for I^+ than for I^- using an one-factor ANOVA. Resulting p-values are given in column 4 of table 6.

> **Regularity 3.** For any given value of x, responders offer more resistance if their individual procedural preferences are satisfied. This is the opposite of what we have expected according to H3a. The difference is significant for $x = 10$ ($p = .087^*$) and $x = 25$ ($p = .059^*$).

In order to further investigate the correlation between the satisfaction of procedural preferences and resistance, we conduct an one-factor analysis of

Table 6: Responders' mean contributions to resistance for I^+ vs. I^- depending on tax proposal x

x	I^+	I^-	difference[a]	p^b
5	1.333	1.224	0.109	.4222
10	4.108	3.112	0.996	.087*[c]
15	5.471	5.408	0.063	.459
20	7.176	6.235	0.941	.107
25	8.147	6.745	1.402	.059*
all	5.247	4.545	0.702	.035**

[a]first column minus second column

[b]one-factor ANOVA, one-sided

[c]*significant at 10%, **significant at 5%, ***significant at 1%

covariance (ANCOVA) overall tax claims x. Our variable of interest is a measure of how much resistance responders offer for all tax claims together under I^+ and I^-. The ANCOVA tests whether the factor "individual procedural preference satisfaction" has an effect on the outcome variable resistance after removing the variance for the covariate "allocated AP (1 or 2)" accounts. Mean resistance for I^- is 4.545, and for I^+, it is 5.247. We find that the difference is significant at $p = .035^{**}$ (one-factor ANCOVA, one-sided)[13].

Regularity 4. Taken over all tax claims x together, ANCOVA reveals that responders offer significantly more resistance ($p = .035^{**}$, one-sided) if their individual procedural preferences are

[13]Note that the covariate itself is not significant ($p = .456$).

satisfied.

Group preference satisfaction According to H3b, tax proposals should be more readily accepted, that is, mean contributions y to resistance are expected to be lower in situations M^+ as compared with M^-. Columns 2 and 3 of table 7 below show observed values of y depending on tax proposals x for M^+ and M^-, respectively.

Table 7: Responders' mean contributions to resistance for M^+ vs M^- depending on tax proposal x

x	M^+	M^-	difference[a]	p[b]
5	1.438	1.080	0.358	.235
10	4.090	3.150	0.940	.100*
15	5.900	4.980	0.920	.061*
20	7.100	6.330	0.770	.156
25	7.950	6.970	0.980	.138
all	5.304	4.502	0.802	.013**

[a]first column minus second column
[b]one-factor ANOVA, one-sided

Obviously, we find that H3b is to be rejected due to the fact that for any x the effect is reversed from what we have expected: Contributions to resistance are higher for M^+ than for M^-. Thus we tested whether the difference is significant using an one-factor ANOVA (one-sided). For $x = 10$ and $x = 15$, the difference is significant with $p = .100^*$, and $p = .061^*$ respectively. To

sum up, there is evidence that procedural satisfaction within the group has an effect on outcome acceptance and a fifth result is:

> **Regularity 5.** For any given value of x, responders offer more resistance if their group procedural preferences are satisfied. This is the opposite of what we have expected according to H3b. The difference is significant for $x = 10$ ($p = .100^{*}$) and $x = 15$ ($p = .061^{*}$).

By applying an ANCOVA test with allocated rule to be the covariate and without distinguishing between tax claims, we find that responders under M^{+} invest 5.304 on average in resistance, whereas responders under M^{-} offer 4.502 mean resistance. The difference is highly significant at $p = .013^{**}$ (one-factor ANCOVA, one-sided).[14]

> **Regularity 6.** Taken over all tax claims x together, ANCOVA reveals that responders offer significantly more resistance ($p = .013^{**}$, one-sided) if their group procedural preferences are satisfied.

Responder situations Since we found a significant difference in average responder behavior depending on whether individual preferences are satisfied (I^{+}) or not (I^{-}) and whether group preferences are satisfied (M^{+}) or not (M^{-}), there might be an interaction effect as well. We therefore compare behavior between the four different responder situations $I^{+}M^{+}$, $I^{+}M^{-}$, $I^{-}M^{+}$

[14]The covariate "allocated rule" is not significant with $p = .227$.

and I^-M^-. The frequency of each responder situation is given in row 2 in table 8.

Table 8 shows average contributions to resistance for each of the four situations. For any claim $x \geq 5$, resistance is highest either for situation I^+M^+ or for situation I^-M^+. This is a further indication that it is most important whether group preferences are satisfied. The lowest average resistance levels correspond either to situation I^-M^- (for any x but $x = 15$) or to situation I^+M^- (for $x = 15$). Thus, hypothesis H3c can clearly be rejected. Indeed, the causality is reversed from what we have expected. The differences between the four situations, however, are not significant using a Kruskal-Wallis test for any x and all x together.

> **Regularity 7.** For any x (but $x = 15$), resistance is lowest if neither individual nor group preferences are satisfied. For any x (but $x \in \{5, 15\}$), resistance is highest if both, individual and group preferences, are satisfied. These results are the opposite of those posited in H3c. The differences between the situations, however, are not significant for any x ($p \geq .399$) and x altogether ($p = .125$).

4 Discussion

Any decision in human interaction is inherently associated with a procedure. It is impossible to take a decision without deciding first on *how* to take it (*Sebald,* 2007a). Besides, there is substantial evidence that not only outcomes but also procedures leading to them can affect people's utility from and their

Table 8: Average contributions to resistance situation by situation depending on tax proposal x

x	I^+M^+ (35)[b]	I^+M^- (18)	I^-M^+ (15)	I^-M^- (32)	p^a
5	1.371	1.306	**1.733**[c]	*0.953*[d]	.604
10	**4.214**	3.833	3.800	*2.766*	.399
15	5.700	*4.889*	**6.367**	5.031	.430
20	**7.243**	7.056	6.767	*5.922*	.799
25	**8.343**	8.056	7.033	*6.359*	.749
all	5.374	5.028	5.140	4.206	.125

[a]Kruskal-Wallis test, two-sided
[b]numbers in brackets: participants in each situation
[c]bold numbers: row maxima
[d]italic numbers: row minima

reactions to those decisions. However, there is a large gap between a sheer bulk of empirical, experimental, and theoretical studies by non-economists and the fact that there is hardly any economic research on procedures. In particular, experimental economists remained surprisingly silent about procedural aspects of strategic interactions. The present study is intended to contribute to this issue by analyzing the effects of various procedures and procedural judgments.

Our experimental data suggest that the effects of procedural fairness judgments are not as strong as assumed. Indeed, people offer less resistance if a fair procedure is used, but the effect is not significant. By contrast, satis-

faction of procedural preferences seem to outrank procedural fairness: The willingness to resist various outcomes differs significantly according to the satisfaction/nonsatisfaction of individual and group procedural preferences.

Following the common conjecture that the implementation of favored procedural characteristics increases the chances that individuals will support even apparently unfavorable decisions (e.g. Dolan et al. (2007)), we expected procedural satisfaction to lower resistance. To our surprise, the causality is reversed: Procedural satisfaction results in stronger resistance against various outcomes. Experimental data show that both individual and group procedural preference satisfaction increase significantly resistance against various outcomes and taken over all outcomes together. Thus, responders' demands vary depending on whether proposers obtained their roles with or without responders' support: People rather seem to accept decisions made by proposers they have not supported.

In an organizational context, subordinates are usually assumed to comply with leaders' directives because they come to believe that "what is" is "what ought to be" in terms of leader behavior (Walker and Zelditch (1993)). However, we may explain the observed behavior by people's belief in their leader. By stating that a procedure should be used, people argue for that appointment procedure. If exactly this procedure is applied, people have indirectly countenanced and maintained the authority. At the same time, responders seem to assert a claim on their behalf: They insist on a fair treatment, or to be precise, on moderate demands. By choosing a decision-maker, some kind of agreement (following Hobbes's Social Contract) seems to become effective. Both the sovereign and the citizens have reason to honor their responsibilities

under the terms of the contract. If the sovereign breaks his agreement (e.g. by claiming a disproportional large share), the citizenry might offer resistance, join a protest or try to bring down the sovereign.

Some psychological studies refer to a similar finding, known as *frustration effect* (see, e.g. Folger (1977), Cohen (1985), Lind and Tyler (1988), and Kulik and Clark (1993)): Fair procedures can not only trigger positive reactions but can also result in less satisfaction with negative outcomes than unfair procedures. This apparent contradiction of the usual finding of a positive relationship was observed under certain conditions. The present study provides evidence that not only procedural fairness but also procedural satisfaction can trigger strong resistance reactions against unfavorable outcomes.

Our experimental setting was intended to differentiate between procedural fairness and procedural satisfaction judgments. Indeed, the two concepts of procedural fairness and procedural satisfaction are closely connected: Procedural fairness judgments frequently involve procedural satisfaction since people usually prefer a procedure they deem fair. However, procedural satisfaction is beyond procedural fairness: Fairness may motivate preferences, but need not to. Many other motives are conceivable but rather elusive.

One key contribution of this paper is to reveal the basic phenomenon of procedural dissatisfaction causing compliance. The finding provides further impetus to study procedural preferences and its consequences on human decision-making. To conclude, experimental data discussed here suggest that procedural concerns should not be excluded if we want to avoid overlooking an important source of utility. Further research on the effects of individuals' procedural judgments is necessary.

5 Appendix

5.1 Appendix I: Sign-up sheet

The original sign-up sheets were in German. Each participant filled in this sheet before the experiment was conducted.

1. Participant number: _____
2. Gender:
   ☐ male ☐ female
3. Age: _____
4. Approximately how many hours per week do you volunteer?

   ☐ less than 1 hour/week
   ☐ about 1 hour/week
   ☐ about 2 hours/week
   ☐ about 3 hours/week
   ☐ about 4 hours/week
   ☐ about 5 hours/week
   ☐ about 6 hours/week
   ☐ about 7 hours/week
   ☐ about 8 hours/week
   ☐ more than 8 hours/week
5. Do you participate in this experiment for the first time? *[applied in session 1 to 3 only]*
   ☐ yes ☐ no
6. Have you participated in the experiment at the University's Open Day 2005? *[applied in session 4 and 5 only]*
   ☐ yes ☐ no
7. Are you studying? *[applied in session 4 and 5 only]*
   ☐ yes, field of study: _____ ☐ no

5.2 Appendix II: Written instructions

The original instructions were in German. They will be sent on request. This appendix reprints a translation of them.

Instructions

Welcome to our experiment!

The experiment lasts about 30 minutes and has four stages. During the first three stages, you will be asked to make decisions. You will get sheets with precise instructions. **Your payment depends on your decisions and the decisions of the other participants.** In stage four, we will ask you to fill in a questionnaire.

Please do not communicate with any other participant from now on. If you have any questions, please raise your hand. We will assist and help you. You are allowed to ask questions at any time. Please do not ask questions in public. Please ask only us, do not ask other participants. Thank you!

Please read the explanations for any decision stage carefully. Then make your decision and enter it in the appropriate sheet. A stage is completed when all decisions are made. Please do not turn back the page.

You will be assigned to a group of **5 people** (you and four other participants). During the experiment, you will play in the same group. Each of your teammates will be handed out exactly the same instructions. We will keep group membership, decisions and payment in confidence.

In our experiment, you can earn **chips**. **At the end of the experiment your earnings in chips will be converted to Euros at the rate of 4 chips = 1 Euro. That is, each earned chip equals 0.25 Euro.** The more chips you earn, the higher your payment will be.

Decision sheet (stage 1)

There are 4 *chip owners* in your group. Each chip owner has 25 chips. The fifth member of your group has no chips at the beginning. The group member without chips will be called *participant X*. No one in your group knows, who participant X is. It might be that you are participant X. Your first task is to imagine to be participant X. As participant X, you have no chips, while each chip owner has 25 chips. It is now up to you to propose, how many chips each chip owner is supposed to yield to you:

0 chips, 5 chips, 10 chips, 15 chips, 20 chips, or 25 chips.

Each participant in your group has been asked to make such a transfer proposal; only one group member is participant X. Later in the course of the experiment, it will be decided who participant X is. Besides, later during the course of the experiment, it will be decided whether the transfer proposal of participant X will be realized.

Example: You decide in favor of a transfer of 10 chips. If you are participant X and your proposal has been realized, you will get 10 chips from each chip owner. These are 40 chips in sum for you. As each chip owner has 25 chips in the beginning and now has to give over 10 chips to you, 15 chips remain for each chip owner. The result of your proposal would be: 40 chips for you in the role of participant X, 15 chips for each chip owner.

Please decide now in favor of a transfer. Mark with a cross the chosen transfer in the last column! Mark with only one tick. If you want to cancel an entry, cross it clearly out and tick another box.

Transfer:	**Each chip owner keeps:**	**As participant X, you get:**	**Mark <u>one</u> entry:**
0 chips	25 chips	0 chips	
5 chips	20 chips	20 chips	
10 chips	15 chips	40 chips	
15 chips	10 chips	60 chips	
20 chips	5 chips	80 chips	
25 chips	0 chips	100 chips	

Stage 1 is completed when you made your decision.

Decision sheet (stage 2)

In stage 1, **each member of your group** made a proposal in the role of participant X, how many chips the other group members should transfer to him/her. However, only **one** member of your group can really be participant X. **One of the following rules** will decide, who will be participant X.

Rule 1: The experimenter decides someone to be participant X without being aware of your proposals.

Rule 2: Your group is asked to vote for one of two options in deciding someone to be participant X: the **oldest group member or the one who volunteers his/her time most frequently. If more than one group member comes into question, (e.g. two persons are of the same age), participant X will be drawn.**

It will not be announced at any time who participant X is.

A) Please, indicate your opinion about both rules.

1. In your opinion, which rule should be used: rule 1 (the experimenter decides) or rule 2 (vote of the group)?

   ☐ rule 1 ☐ rule 2

2. Please give reasons for your decision:

   _____

   _____

3. How do you rate the importance of the appointment procedure on a scale from very important to completely unimportant?

   very important ☐ ☐ ☐ ☐ ☐ ☐ ☐ completely unimportant

4. How do you rate rule 1 (the experimenter decides) on a scale from very unfair to completely fair?

   very unfair ☐ ☐ ☐ ☐ ☐ ☐ ☐ completely fair

5. How do you rate rule 2 (vote of the group) on a scale from very unfair to completely fair?

   very unfair ☐ ☐ ☐ ☐ ☐ ☐ ☐ completely fair

B) Please vote now: Who should be participant X, if rule 2 is used? If you do not tick any box, you cast a ballot for the first possibility.

☐ the oldest participant
☐ the participant who volunteers his/her time most frequently.

Stage 2 is completed when you have answered all questions.

Comments on stage 3

In stage 2, you and any other group member have indicated whether **rule 1** (the experimenter decides) or **rule 2** (vote of the group over the criteria *age* and *engagement*) should be used. The result of the vote is as follows:

_____ group member(s) voted for rule 1 and
_____ group member(s) voted for rule 2.

Thus, the majority voted for rule _____.

In your group, the majority / minority (*deleted as applicable*) decides which rule will be used. Thus:

Participant X of your group will be assigned by rule _____.

Participant X is yet to be determined, but you do not know, who it is and which transfer participant X claims. In case you are **not** participant X but a chip owner, you have to make another decision: Do you pay voluntarily the transfer to participant X or do you resist? Because you do not know, which transfer participant X has claimed, you have to decide **for each possible proposal** of participant X. In case you are participant X, your decision in stage 3 is irrelevant.

As a chip owner, you are now endowed with 25 chips. Participant X claims a transfer from you and from the other chip owners: either 0, 5, 10, 15, 20, or 25 chips. **If you do not want to pay the transfer,** you may pay any number of chips out of your 25 chips into a **common account**. Half chips can be payed, to. All chip owners are asked to do the same. **In case the chip owners pay at least 26 chips in sum into the common account, the transfer to participant X need not to be paid.**

Thus there are two alternatives:
1. **There are paid 26 chips or more in sum into the common account:** Then nobody has to transfer anything to participant X. Thus participant X receives 0 chips. The chip owners can keep all chips, which they have not paid into the common account. The chips paid into the common account are lost.
2. **There are paid less than 26 chips in sum into the common account:** The chips paid into the common account are lost. All chip owners have to pay the transfer; if they have not enough chips left, they will pay as much as they can. Participant X receives the transfer he/she has asked for or somewhat less, if a chip owner has not got enough chips left to pay the whole transfer.

Three examples: Participant X asks each chip owner for a transfer of 10 chips. You do not want to pay the transfer.

1. You pay 5.5 chips into the common account. The other three chip owners pay 22.5 chips in sum. Thus, there are 28 chips in the common account. Therefore, the transfer need not to be paid. You will receive 19.5 chips: 25 chips minus 5.5 chips (your transfer into the common account) equals 19.5 chips. Participant X receives 0 chips.

2. You pay 6 chips into the common account. The other three chip owners pay 13.5 chips in sum. Thus, there are 19.5 chips in the common account. Therefore, the transfer must be paid. You will receive 9 chips: 25 chips minus 6 chips (your transfer into the common account) minus 10 chips (transfer) equals 9 chips. Participant X receives 40 chips in sum: 10 from each chip owner.

3. You pay 20 chips into the common account. The other three chip owners pay 3.5 chips in sum. Thus, there are 23.5 chips in the common account. Therefore, the transfer must be paid. You will receive 0 chips: 25 chips minus 20 Chips (your transfer into the common account) equals 5 chips; you have to transfer these 5 chips to participant X. Participant X receives 35 chips in sum: only 5 chips from you, because you cannot pay more, and 10 chips from each other chip owner.

You will receive 0.25 Euro cash for each chip you have earned in stage 1 to 3.

Decision sheet (stage 3)

For your group applies:

Participant X will be assigned by rule _____.

As a reminder: rule 1 says that the experimenter determines participant X. Rule 2 says that the group votes.

In case you are a chip owner and not participant X please specify, how many chips you want to pay into the common account: 0 chips, 0.5 chips, 1 chip, 1.5 chips, 2 chips, 2.5 chips, 3 chips, ...24 chips, 24.5 chips, or all 25 chips. You are asked to make a decision for *each* possible transfer proposal of participant X.

1. Assume that participant X claims a transfer of 25 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

2. Assume that participant X claims a transfer of 20 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

3. Assume that participant X claims a transfer of 15 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

4. Assume that participant X claims a transfer of 10 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

5. Assume that participant X claims a transfer of 5 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

6. Assume that participant X claims a transfer of 0 chips. In this case, how many of your 25 chips do you want to pay into the common account?

   I would like to pay _____ chips.

Stage 3 is completed when you have made all six decisions.

Questionnaire (stage 4)

Finally, we would like to ask you to fill in a short questionnaire.

1. The comments to stage 1 (decision as participant X) were clear and comprehensible.

   I agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ I do not agree

2. The comments to stage 2 (determination of participant X) were clear and comprehensible.

   I agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ I do not agree

3. The comments to stage 3 (decisions as chip owner) were clear and comprehensible.

   I agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ I do not agree

4. I tried to earn as many chips and thus as many Euro as possible.

   I agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ I do not agree

5. I thought twice about each decision.

   I agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ I do not agree

6. Your group has been assigned one out of two possible rules for determination of participant X. Subsequently, you have decided on your individual resistance for each possible transfer proposal of participant X. How do you rate the influence of the assigned rule on your individual resistance decisions?

   strong influence ☐ ☐ ☐ ☐ ☐ ☐ ☐ no influence at all

7. Each group member has voted which rule to determine participant X is right.The result of the vote has been communicated to you. How do you rate the influence of the group opinion on your individual resistance decisions?

   strong influence ☐ ☐ ☐ ☐ ☐ ☐ ☐ no influence at all

8. What is a fair transfer proposal of participant X?

   A fair transfer proposal of participant X is _____ chips.

9. Remember your decision in the role of a chip owner in response to a transfer proposal of 15 chips. In your opinion, should your group offer resistance?

   ☐ no ☐ yes

10. Let us assume that you would know the other three chip owners have paid exactly 19.5 chips into the common account in response to a transfer proposal of 15 chips. What would you do?

    In that case, I would pay _____ chips into the common account.

Thank you very much for participating!

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