DFG Research Group 2104
Need-Based Justice and Distribution Procedures

I Share, if You Share: Conditional Altruism regarding Third Actors

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Working Paper Nr. 2019-01

http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2019-01.pdf

Date: 2019-08

DFG Research Group 2104 at Helmut Schmidt University Hamburg
http://needs-based-justice.hsu-hh.de

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Conditional Altruism regarding Third Actors

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August 2019

Abstract

Altruism and solidarity are powerful drivers of human behavior, leading individuals to forgo own economic gains to share with the less fortunate. In groups, sharing with others can have two conflicting fairness aspects; while it reduces inequalities toward disadvantaged actors, it can also lead to inequalities among sharing group members, if they do not share equally. Unlike previous studies which focus on unitary group decision-making, I examine bilateral bargaining in an experiment, in which subjects have to allocate payoffs between an uninvolved third individual *and* themselves. The data reveal that fairness between the negotiators is more important than fairness towards the third player: individuals only allocate payoff shares to third players if their bargaining partner is willing to allocate the same amount, even if their other-regarding preferences differ strongly from each other when revealed individually. The results provide new insights into group decision-making with internal conflict and offer important perspectives on why morals decline in experimental markets with externalities, why communication does not help to overcome the bystander effect, and why preferences regarding policies to support people in need depend on other states.

Keywords

Group decision-making, internal conflict, bargaining, social preferences, conditional altruism

JEL-Classification

C78, C92, D64, D91

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[b] I gratefully acknowledge funding by the Deutsche Forschungsgemeinschaft (DFG, KI 1419/2-1) and the Austrian Wissenschaftsfonds (FWF, I1888-G11).

1. Introduction

A vast amount of evidence indicates that humans as social beings not only care about their own well-being but also about the well-being of others (Fehr and Fischbacher 2003). When the European Union negotiates an asylum regime, for example, along with negotiating which countries should block immigration routes, the member states also negotiate about the magnitude of support for refugees and how to allocate asylum seekers among the member states. Since "citizens care deeply about the fairness of the responsibility-sharing mechanism, rather than only the consequences of the asylum policy" (Bansak et al. 2017:1), however, this task is intricate. While sacrificing payoffs to support individuals in need can reduce inequalities, it can, in turn, create inequalities among group members if not all members share equally, therefore, creating a conflict between fairness aspects. Given that fairness or other-regarding preferences are heterogeneously distributed across any group, implying that some actors are more self-interested than others, negotiation yields two potential conflicts of interests. On the one hand, a group has to agree on how many resources they must allocate to the third actors. On the other hand, the members have to agree on how to divide the costs between themselves.

Understanding the nature of altruism is important for explaining and predicting human behavior under different institutional designs. An extensive experimental literature on other-regarding preferences analyzes systematically whether and under which conditions individual behavior deviates from self-interest (Cooper and Kagel 2016; Fehr and Schmidt 2006; Konow and Schwettmann 2016). Building on these insights later studies investigated other-regarding preferences in unitary group decision making (Charness and Sutter 2012; Kugler et al. 2012). A feature of studies on unitary groups, or teams, is that any action taken has the same consequences for the in-group members, which means that all members have identical payoffs by design. In this paper, I examine how two individuals allocate payoffs if they not only negotiate whether to allocate some payoff to third actors, but at the same time how to distribute the surplus between themselves.

Group sharing with internal conflict occurs whenever multiple people distribute costs and benefits among themselves and directly or indirectly affect third actors including buyer and seller bargaining over surplus while exerting externalities on a producer, corporate team members allocating workload between themselves and a new employee, or parents distributing the chores between themselves and their child. In all these settings some individuals will be willing to forfeit own gains to benefit the third actor. The question asked in this paper is whether Bansak et al.'s

(2017) observation, that people condition these fairness considerations on their bargaining partner, follows a more general behavioral regularity. Experimental evidence on this question is ambivalent. For example, if we understand equality as an *altruistic public good* (Betts 2003; Suhrke 1998), the public good literature suggests that subjects contribute conditionally (Fischbacher et al. 2001). Yet, accounting for the generic heterogeneity of other-regarding preferences, evidence suggests that subjects who value the public good more, also contribute more (Fischbacher et al. 2014; Fisher et al. 1995), which accordingly would imply that other-regarding behavior is independent of others.

To address the question theoretically, I approach the decision problem from the perspective of other-regarding preferences, controlling for individual economic interests of equality (e.g., Wilkinson and Pickett 2010). I study bilateral negotiations in a controlled environment in which two individuals have to allocate a fixed resource among three individuals, themselves and an excluded actor. Formally, I use different utility functions and apply them to the Nash bargaining solution (Nash 1950). The concept of inequality aversion, which assumes that individuals evaluate their utility by comparing their own payoff to the average payoff, predicts that those with stronger other-regarding preferences should forgo more payoff to reduce inequalities toward the third actor (Bolton and Ockenfels 2000). However, pairwise inequality aversion, which assumes that individuals are sensitive to changes in the distribution of payoffs over other individuals, predicts that negotiators transfer payoffs only to the third actor if both negotiating partners receive an even amount of payoff (Fehr and Schmidt 1999). I test the predictions of the models against each other in a laboratory experiment implementing an unstructured, bilateral bargaining game with a third uninvolved player. To validate the predictions, I additionally elicit subjects' distributional preferences in isolation to compare the group to individual behavior.

Overall, the observed outcomes fit the predictions derived by pairwise inequality aversion significantly better than the alternatives. Payoffs between negotiators are equal more than 90 percent of the time, where the extreme ends of the spectrum serve as focal points of the agreements, i.e. in a majority of cases the third actor receives none or one-third of the payoff. The behavior in the negotiations also correlates strongly with the distributional preferences in isolation, implying individually revealed other-regarding preferences can predict subjects' average transfers during the negotiations. Altogether, the results provide evidence that other-regarding behavior does not only depend on a direct comparison towards people in need but also on indirect comparisons toward other actors who are in the position to help.

The remainder of this paper is structured in the following way: First, I review relevant experimental literature on bargaining and social preferences. Further, I derive predictions of the utility models and describe the experimental design to compare the predictive quality of the models. In sections 4 and 5, I present the laboratory experiment and the results. Finally, I discuss the findings, how they contribute to the existing literature, and potential limitations.

2. Sharing in Groups with Internal Conflict

Suppose a group has to distribute some payoff among themselves and third actors. 'Themselves' is a group of two or more individuals who are in some way able to decide the outcome of a distribution.[3] 'Third actors' are one or more individuals who are excluded from decision-making and receive payoffs from the deciding group. In what follows, I will refer to this decision problem as *group sharing with internal conflict*.

In principle, group sharing with internal conflict involves two aspects which have previously been examined separately. On the one hand, the experimental bargaining literature examines how payoffs are distributed within a group (Palfrey 2016). On the other hand, the literature on other-regarding preferences examines how payoffs are distributed to others (Cooper and Kagel 2016; Fehr and Schmidt 2006; Konow and Schwettmann 2016). While both literature strands have inspired a vast amount of research, there is relatively little research combining both elements. Only recently, studies on experimental markets analyze for example how the surplus is shared when the outcome affects third individuals in the form of externalities (Bartling et al. 2015).

The main bargaining literature focuses on institutional factors and implements specific bargaining protocols to study how first mover power, the quorum, communication, group size, or nominal power affect the distribution of payoffs within a group (e.g., Agranov and Tergiman 2014; Fréchette et al. 2003; Maaser et al. 2019; Miller and Vanberg 2013, 2015). In a structured three-person ultimatum game with a proposer of the offer, a responder and a third actor (e.g., Güth and Van Damme 1998), the former do not make a common decision together but, make decisions after each other. In contrast, studies on other-regarding preferences in groups, reviewed in the following paragraph, mostly implement unstructured decision-making within the group. One concern is that

[3] Note that sociologists usually define a group only as three or more individuals. In this context dyads are included to the definition of a group, since mechanics such as 'responsibility diffusion' work in theory in dyads as well.

other-regarding preferences are likely to interact with decision-making rules (Sauermann and Glassmann 2014). Additionally, the external validity of structured bargaining experiments is recurrently questioned (Camerer 2003; Tremewan and Vanberg 2016).

To promote applicability, I will, therefore, focus on an unstructured bargaining setting with a minimal bargaining protocol. The equal split serves as an important focal point in unstructured bargaining, independent of individual bargaining skills or risk preferences (Bartling and von Siemens 2010; Murnighan et al. 1988; Nydegger and Owen 1974), as long as information, payoff function, entitlements, or structural power between negotiators are symmetric (Gächter and Riedl 2005; Roth et al. 1981; Schwaninger et al. 2018). With respect to third actors, there is evidence that the in-group communication structure can affect transfers to third actors (Kittel and Luhan 2013).

Group sharing with internal conflict involves an excluded third actor. Assuming self-interest, one would not expect individuals to share payoff with others when they have no strategic reason. However, neither individuals in isolation nor individuals in committees, nor groups behave purely in self-interest (Charness and Sutter 2012; Cooper and Kagel 2016; Konow and Schwettmann 2016; Kugler et al. 2012). For example, in the dictator game which is utilized to study altruistic giving, the average team transfers to other groups lie between 10.8 and 25.6 percent of the endowment (Cason and Mui 1997; Engel 2011; Franzen and Pointner 2014; Luhan et al. 2009). Neuroscience also provides measurable physical evidence that fairness considerations affect how individuals evaluate distribution outcomes (Feng et al. 2015; Rilling and Sanfey 2011). More precisely, they value fairness in two ways. Individuals are prosocial when ahead in payoffs and envious when behind, frequently refusing payoffs if accepting the offer would result in an uneven distribution of payoffs (Güth et al. 1982). Aversion to lower relative payoffs can also explain why cooperation is frequently conditioned on the cooperation of others (Fischbacher and Gächter 2010; Fischbacher et al. 2001). The most prominent and influential models explaining the observed behavior rely on the concept of inequality aversion (Bolton and Ockenfels 2000; Fehr and Schmidt 1999). Empirically, these utility models predict accurately as long as individuals face no equality-efficiency trade-off (Konow and Schwettmann 2016).

Taken together, when groups with internal conflict allocate payoffs, we may predict that if subjects are self-interested they will share the payoff equally among themselves and transfer no payoffs to third actors. If they hold other-regarding preferences, they are likely to allocate payoff to third individuals. The question arises when two individuals have opposing distributional preferences, who will enforce their own preferences? From a game theoretical perspective, assumptions over the specific form of the utility function lead to distinctly different predictions. Whereas the assumption, that people compare their own share to the mean, implies that they agree to allocations independent of the bargaining partner; the assumption that people compare their payoff to each individual implies that they are sensitive to changes in the distribution of payoffs over other individuals. The assumption that individuals dislike being behind in payoffs more than ahead implies that payoffs between negotiators must be equal. Therefore, any transfer to the third individual may be conditional on both negotiating partners.[4] Empirically, some evidence suggests that groups with internal conflict coordinate on equal shares (Panchanathan et al. 2013). Yet, if equality of payoffs is seen as an implicit public good, subjects who value it more may contribute more, even under uncertainty about others' preferences (Fischbacher et al. 2014; Fisher et al. 1995).

The recent literature on experimental markets with externalities combines elements of bargaining and social concern. The actors' primary task in the market is to negotiate the price of a good, which determines how the surplus created by the exchange is divided between buyer and seller. The additional feature in those markets is the choice over the kind of good they want to trade. The actors on the market can decide whether they want to trade a good which exerts higher or lower negative externalities on an uninvolved third actor. The cost of lower externalities is called price premium, which lowers the available surplus for the negotiators and increases the payoff for a third actor. Hence, in a bilateral market with externalities, the negotiators implicitly divide payoffs between themselves and an uninvolved third actor. Naturally, some externalities are more visible (e.g., effects of the Brexit deal on Ireland) than others (e.g., detrimental working conditions), but when they are salient enough, their consequences are considered. Experimental results indicate that a fixed price premium is borne equally between the negotiating individuals (Bartling et al. 2015). As in groups, results suggest it is the alleged diffusion of responsibility that undermines other-regarding preferences in markets with externalities (Kirchler et al. 2016) and not market competition (Falk and Szech 2013). This suggests similar dynamics of other-regarding behavior in groups and on markets.

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4 Conditional cooperation usually implies that cooperation leads to a more efficient, mutually beneficial outcome than defection. Conditional altruism toward third actors is not economically Pareto efficient for the decision makers, nor is it conditional on the behavior of the actual monetary beneficiary.

In sum, even though there is a rich literature on social preferences of groups, other than the discontinuity effect, which refers to the observation that groups are generally less generous than individuals are, there is relatively little evidence on how varying social preferences interact and aggregate in group decisions. Decisions made by individuals in isolation are typically poor predictors of group behavior (Charness and Sutter 2012) and considering median preferences is uninformative in settings with internal conflict. To approach group sharing with internal conflict, I theoretically and experimentally examine an unstructured bargaining game.

3. Cooperative Bargaining Solution with Inequality Aversion

Two individuals negotiate how to divide a fixed surplus among themselves and a third individual in an unrestricted and costless bargaining environment. I make use of the Nash bargaining solution (Nash 1950, 1953) to predict the outcome of the bilateral negotiations. In the original model, John Nash assumed that all individuals aim to maximize own monetary payoffs. In contrast, I also allow for heterogeneous other-regarding preferences.

Suppose there are three individuals i, j, and k, where $i \neq j \neq k$. While individuals i and j bargain over the distribution of a bargaining value, v, individual k is excluded from the negotiations. The negotiated payoff for individual i with individual j is denoted by x_i, with $0 \leq x_i \leq v$. The disagreement point is zero, which means that subjects receive no payoff if they cannot agree on any offer. To solve the allocation problem, individuals i and j bargain over the payoff shares x_i, x_j and x_k as if they would solve the following optimization problem,

$$max\ u_i(x) * u_j(x) \text{ subject to } x_i + x_j + x_k = v, \tag{1}$$

where $u_i(x)$ is the utility of individual i, which depends on the distribution of the payoff shares. If the utility functions of i and j are convex, this bargaining solution is symmetric, independent of scale, independent of irrelevant alternatives, and Pareto efficient.[5] Pareto efficiency implies that if the utility at the disagreement point is zero, i.e. $u(0) = 0$, which is the case for the utility functions that I will compare in the following, where an individual does not agree on any outcome resulting in a negative individual utility.

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[5] For an extension to nonconvex problems see Conley and Wilkie (1996).

Assuming as a reference case that the utility only increases in own payoffs, i.e. $u_i(x) = x_i$, the distribution $(x_i, x_j, x_k) = (v/2, v/2, 0)$ is optimal. In this case, the extension by individual k introduces only irrelevant alternatives since the bargaining partners are strictly self-interested and the third actor receives no payoff. By contrast, if we assume that the individuals not only value their own payoffs, but also the relation of their own payoffs to the payoffs of others, the third individual may receive some payoff shares. Similar to modelling risk preferences in this setting, the outcome then depends on the specific properties of the utility function of the two bargaining individuals and the relative weights attached to own and other's payoffs.

To solve the optimization problem in (1), I make use of three utility functions, which incorporate the idea of other-regarding preferences in different ways. First, I derive predictions assuming preferences of Cobb-Douglas form (CD), which is frequently used to model the trade-off between own and others' payoffs (Andreoni 1990; Andreoni and Miller 2002; Nax et al. 2015). Depending on the relative weight between own and others' payoffs, the utility model rationalizes costly transfers to others due to a diminishing marginal rate of substitution. The second utility function I consider integrates the properties proposed by Bolton and Ockenfels (2000, BO). Conceptualizing the idea of inequality aversion, BO alleges that individuals' utility decrease when the own payoff deviates from others' payoff. In particular, the model assumes that utility decreases exponentially in the difference between own and mean payoff. The third utility function was developed by Fehr and Schmidt (1999, FS). FS also conceptualize the idea of inequality aversion. However, in contrast to BO, the model assumes that individuals compare their payoff pairwise to others' payoffs and dislike disadvantageous inequality more than advantageous inequality.

[Figure 1 about here]

Figure 1 shows the three utility functions and the different transfers to the third actor assuming a uniform distribution of other-regarding weights.[6] In contrast to the standard model, CD rationalizes different and independent payoff shares between the negotiators and positive transfers to the third actor, which is depicted in Figure 1 by the grey area above the x-axis.

[6] Results are formally derived in the Appendix. They imply that the aggregate outcomes depend on the distribution of other-regarding preferences. The distribution is unknown, assuming every weight has the same probability, enables arguably the most insightful comparison between the outcomes.

Proposition 0: A share of the bargaining partners do not allocate all payoffs between themselves. (supported by CD, BO, FS)

Using CD, the payoff share of the third individual can even get higher than one third if other payoffs weigh more than own payoffs to the bargaining partners. Similarly, BO predicts that the third individual obtains positive payoff shares when the disutility of inequality is sufficiently strong (the constraint is $3(\vartheta_i + \vartheta_j)/2\vartheta_i\vartheta_j < v$). Yet, inequality aversion implies that it cannot be optimal that the thirds' payoff share is higher than one third.

Proposition 1: The bargaining partners allocate strictly less or equal than one-third of the payoff to third actors. (supported by BO, FS)

BO also rationalizes different and independent payoff shares of the negotiators, since the own utility is only affected by the mean, which is a constant. In contrast, FS implies that any optimum requires even payoff shares between the negotiators, i.e. $x_i = x_j$. The reason is that other-regarding preferences necessary to break this condition ($1 + 0.5\,\alpha_i < \beta_i$) are not realized due to the assumptions of the model ($\beta_i \leq \alpha_i$ and $0 \leq \beta_i < 1$). Intuitively, the two negotiators will always agree on even payoffs between themselves, because the utility gained by reducing the payoff difference to the third individual is always lower than the negative utility gained by increasing the payoff difference to the bargaining partner simultaneously (and the negative utility from the decreasing payoff). Thus, in contrast to CD or BO, FS captures the idea that negotiating partners are deeply concerned about a fair allocation between themselves.

Proposition 2: The bargaining partners allocate payoffs strictly equally between themselves. (supported by FS)

Let me discuss further how the preferences modeled by FS aggregate using the Nash product. In isolation, the utility function is constructed such that an individual prefers either to get all the payoff or to share the payoffs equally among all three subjects, depending on whether $\beta_i \lesseqgtr 2/3$ (in the two-player case it is $\beta_i \lesseqgtr 1/2$). The worse-off weight (α) plays only an indirect role, in the sense that it ensures that an individual does not prefer to get less payoff, but the preferred distribution is independent of its exact value given that $\beta_i \leq \alpha_i$ and $0 \leq \beta_i < 1$. Thus, when two individuals bargain with each other over the distribution of some payoff, we can differentiate three cases: (1) both individuals are rather self-interested with $\beta < 2/3$, (2) both individuals are rather prosocial with $\beta > 2/3$, or (3) one individual prefers to maximize own payoffs, $\beta_i < 2/3$, and the other individual prefers equality of payoffs, $\beta_j > 2/3$.

The first two cases are straight forward. When two rather self-interested individuals' bargain, they will agree on the even two-way split. As long as both $\beta < 2/3$, the specific better-off weights do not affect the outcome, because Nash's bargaining solution ensures that the agreement is independent of scale. When two rather prosocial individuals' bargain, they will agree on the even three-way split since their preferences are not conflicting. Thinking one step ahead, this also implies that observing three or more individuals consecutively bargaining with each other, at least half of the agreements will be an even two-way and three-way split, because at least half of the dyads will share the same distribution preference in isolation.

The most interesting case is the third when one individual prefers maximum payoff, the other individual prefers equal payoffs. In this case, the relative weights of the inequality aversion parameters determine the outcome, which is shown graphically in Figure 2. It can be inferred that individuals who have more polarized preferences are more assertive, enforcing their preferences. For example, let the better-off weight of an individual i be $\beta_i = 9/20$. This individual prefers to maximize own payoffs. When i bargains with an individual j with $\beta_j = 14/20$, who prefers equality, i's preferences are relatively stronger in comparison and individual i enforces the two-way even split. However, if individual j has stronger egalitarian preferences, say $\beta_j = 18/20$, then the relative importance flips and the dyad will agree on the three-way even split. In other words, the more important profit (equality) is for an individual, the more likely the individual will enforce this preference in the negotiations, since the individual becomes more reluctant to agree on a more (less) equal distribution. When the preferences are similarly weighted, then the bargaining individuals agree on a compromise, where they receive an even share and allocate a share $x_k = [0; 1/3]$ to the third actor. Most of the time, the Nash product transforms the individual preferences into the outcome preferred by the individual with stronger preferences. Only when the preferences outweigh each other, the bargaining solution is a compromise between the two-way and three-way even split.

[Figure 2 about here]

4. Experimental Design

The experiment is designed to emulate the theoretical environment. To test the propositions, I incentivize bilateral negotiations in which the participants have to distribute the payoffs between themselves and an excluded third individual. In addition, I elicit distribution preferences in isolation. To control for ordering effects, I vary the sequence of the bargaining game and the individual tasks between subjects. In the *I-B treatment*, the participants complete the individual decision tasks before the bargaining game, while in the *B-I treatment* they complete the individual tasks after the main experiment.

4.1. Bargaining game: Sharing with internal conflict

In this part, I implement the bilateral bargaining game. Two-thirds of the participants are randomly selected to bargain over the distribution of payoffs and one-third of the participants are excluded from the payoff-relevant negotiations. This role remains constant throughout an entire session of the experiment. In each period, two bargaining partners are matched together with one excluded player and have to bargain over the distribution of 72 points.

To make an offer a subject has to allocate exactly 72 points among the bargaining partners, and the third subject who cannot participate in the negotiations.[7] The format of the proposals is restricted to numbers shown in private on the computer screen and further communication is prohibited during the experiment. Within each period, individuals are able to send as many offers and counteroffers as they choose at any point in time. In this sense, bargaining is costless, unrestricted and not subject to a specific protocol. Only the most recent proposal of the bargaining partner can be accepted. If the bargaining partners agree on a distribution of payoffs, it was implemented for all three subjects. Agreements have to be reached within two minutes. The bargaining partners can accept offers after 30 seconds. If no agreement is reached, all three subjects receive zero points. In this sense, any agreement is economically Pareto-efficient. When an agreement is reached or the time ends, the subjects are informed about their payoffs and a new round begins.

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[7] I choose a relatively high number of points to broaden the action space of the subjects and allow a meaningful variance of outcomes. Participants can use a calculator integrated in the bargaining interface.

Each session consists of 24 participants who engage in the negotiations over 20 rounds. In the first five rounds, the 16 bargaining partners are randomly re-matched. In the last 15 rounds, the 16 subjects are matched such that each bargaining partner bargains exactly once with each bargaining partner. At the end of the session, three periods are randomly selected and paid. In the meantime, the 8 excluded subjects also negotiated with each other, but their outcomes are not relevant for the payoff, which is common knowledge to all participants.

4.2. Individual distribution preferences

To compare the bargaining behavior with the behavior in isolation, I elicit the individual distribution preferences in two ways. All subjects complete an extended Equality-Equivalence test (henceforth EET; Kerschbamer 2015) and a three-person random dictator game.

The *EET* measures preferences for inequality aversion. It is an established, incentivized task assessing an individual's distributional preferences, based on decisions between various distribution alternatives. Subjects face several pairs of allocations and for each pair, they have to choose whether they prefer the left or right option.[8] For all pairs, the variables are held constant except the own payoff of the left option which is increasing for every new option. We can observe when a subject switches from left to right and use this decision as a proxy for the inequality aversion weight. The EET originally includes five items on disadvantageous inequality (1-5) and five items on advantageous inequality (6-10). I extend the latter by three additional items (11-13). The three items follow the logic of the EET, but every item increases the trade-off between own payoff and equality further to get a more precise measure of the better-off weight. One of the decisions is randomly chosen per subject and paid to the decision-maker and a paired recipient. Hence, each subject earns payoff twice, once as a dictator and once as a recipient. It is ensured that a dictators' recipient is not simultaneously the recipients' dictator, such that decisions are not mutually payoff relevant.

The *dictator game* elicits the most preferred distribution of an individual allocated over three subjects. The participants are randomly assigned to groups of three and each participant has to allocate exactly 72 points between themselves and two other subjects. At the end of the experiment, one of the three subjects is randomly selected and the participants' decision is payoff relevant. As

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[8] See the Appendix for the implemented distribution options.

in the bargaining game, the dictators cannot differentiate between the two other group members on any objective grounds. Group size and the distributable payoff is also the same in the dictator game and the bargaining game. In comparison, only the number of active decision-makers changes from one to two and the number of passive group members change from two to one. The three-person dictator game elicits the ideal outcome that a subject aims to enforce during the bargaining game.[9]

All decisions in isolation are anonymous and participants do not receive any information about their payoff from the individual tasks until the end of the experiment. Since the participants are unaware of the outcomes of the individual tasks, the influence on the negotiations should be relatively low in the I-B treatment. To control for possible ordering or framing effects, I vary the order of the experiment and measure the individual preferences in the B-I treatment after the negotiations. Note, however, in the B-I treatment it was possible that the individual decisions are affected by the bargaining outcomes since bargaining partners know the outcomes of the previous bargaining rounds.

4.3. Further Measurements

At the end of the experiment, the participants filled a short questionnaire. Since risk preferences are frequently discussed in bargaining settings, I included a self-reported measure for risk preferences, which is empirically more predictive of behavior than alternative incentivized measures (Dohmen et al. 2011; Lönnqvist et al. 2015). To gain more information about factors that could influence the bargaining behavior, I included questions about assertiveness, compassion, and trust (Danner et al. 2016; Soto and John 2017), a self-reported assessment of the bargaining skill, and socio-economic background variables.

4.4. Procedure

I conducted six sessions with 24 subjects each at the Vienna Center for Experimental Economics in March 2018, resulting in a sample of 144 subjects evenly divided between the two treatments. Subjects are all students registered at a Viennese University, on average in their fifth

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[9] For a dictator game with two dictators, one recipient and an implemented strategy method, I refer the reader to the study of Panchanathan et al. (2013). Yet, I included a separately incentivized battery with seven items that holds the sum of payoffs constant and distributes the payoff among three subjects. Designed similar to the EET, these items aim to capture the willingness to share payoff with a third individual, given the payoff of a second individual and constant efficiency (14-16), inform about preferences for alter-alter differences (17), preference for an even two-way or three-way split (18), self-interest (19), and altruism (20). In this paper, I focus mainly on the decisions in the EET and the dictator game and do not explicitly explore these items further.

semester, with a median age of 23. The experiment was fully computerized using z-Tree (Fischbacher 2007) and the participants were recruited using ORSEE (Greiner 2015). An experimental session lasted less than two hours.

The participants are all provided with written instructions. Instructions for the individual tasks and the bargaining game are handed out only after each other. Participants know that the experimental session consists of several parts, but do not know the content of the future parts before the respective instructions are provided. See the Online Supplementary Appendix for the full instructions in German and translated from German to English.

At the end of the experiment, the program converts the earned payoffs into Euros and the laboratory assistants pay the participants separately and in private. In sum, the payoff of the participants consists of three bargaining outcomes (3 rounds randomly selected) and three individual decisions (EET, additional items, dictator game). The payoffs between first and second part (B and I) were evenly weighted and paid on average roughly the same. The participants earned on average 29.42 Euros, including a 5.71 Euro show-up fee.

5. Results

Analyzing the data consists of two parts. In the first part, I give a descriptive overview about the observed bargaining outcomes, compare their properties to the propositions derived in section 3 and fit the three different models to test which functional form explains the data most accurately. In the second part, I compare the transfers from the bargaining game with the individual transfers in the dictator game to validate the argument that social preferences affect the bargaining outcomes systematically.

5.1. Bargaining Outcomes

The data show that in 67.3 percent of the cases, bargaining partners allocate payoff to the third actor. They transfer 15.8 percent of the negotiable payoff on average. While pure self-interest cannot explain the positive transfers, other-regarding preferences can (*proposition 0*, CD, BO, FS).

[Figure 3 about here]

Figure 3 shows the relative payoff share transferred to the third actor in the two treatments (I-B, B-I) over time. In the initial rounds, the transfers decrease and converge to about 15 percent of the negotiable payoff. In both treatments the average transfers do not decrease significantly after round 5 (Pearson corr., p = .59, p = .18). To control for the learning effects in the first 5 rounds, I concentrate in the following analysis of the data, on round 6 to 20. Furthermore, there is no statistical difference between the average transfers in I-B and B-I according to the Mann-Whitney test (in each round, p > .10).[10] The statistical indifference between the two treatments indicates no significant framing or ordering effects of the individual tasks on the bargaining game.

Figure 4 shows the distribution of payoff shares transferred to the third individual in the two treatments. In line with *proposition 1*, which follows from the assumption that individuals are inequality averse (BO, FS), transfers to third actors virtually never exceed one-third of the payoff. In a majority of cases, the transfers accumulate exactly at zero (35.1 percent) or at one third (24.4 percent) of the payoff, which aligns with the predicted patterns of FS. Another accumulation point seems to be one-sixth of the payoff (10.0 percent), which is not anticipated by any of the models. This allocation may be attractive since it offers an even compromise between more self-interested and more other-regarding subjects.

[Figure 3 about here]

To examine *proposition 2*, Table 1 describes how the bargaining partners distribute the remaining payoffs between themselves, in particular how often the payoff is distributed equally between the bargaining partners. The agreements are divided into the payoff share of the third individual and the payoff split between the negotiators. Overall the payoff shares between the negotiators are equal in 90.5 percent of the agreements. More precisely, in 17 out of the 720 negotiations (2.4 percent), the subjects cannot agree on a distribution. Moreover, in 456 of the 703 negotiations (64.9 percent), the third subject receives more than zero points. In 429 out of these 456 negotiations (94.1 percent), the negotiators agree on even payoffs between themselves.

[Table 1 about here]

[10] All reported *p*-values refer to two-sided tests.

Furthermore, the data indicate that interpersonal payoff comparisons between the bargaining partners already influence which offers are proposed. From round 6 to 20, the subjects made 720 first offers. In none of these offers, the proposer offered to pay more for the payoff share of the third actor than the bargaining partner. In response to received offers, the subjects made in sum 2288 counteroffers, of which 890 (38.9 percent) suggested to increase the payoff share of the third actor. In only 31 (< 0.1 percent) of these offers, the subjects proposed to pay more for the higher transfer. When subjects do not suggest paying equally for the transfer of the third actor (82.2 percent), they suggest that the bargaining partner should pay for it (16.6 percent). Essentially, these results support the idea that most individuals evaluate the final payoff pairwise and dislike disadvantageous inequality more than advantageous inequality (FS) in this setting.

In order to statistically compare the explanatory power of the different utility models, I calculate the individual other-regarding preference weights that minimize the sum of squared residuals (*SSR*) between the observed and predicted payoff shares allocated to the third subject.[11] I focus on the payoff share of the third individual since CD and BO have difficulties to explain the high number of even payoff shares between the negotiators. Optimizing with respect to the specific functional forms, the *SSR* is significantly smaller for FS than BO and CD (each paired Wilcoxon test, $p < .01$). In comparison to the assumption of strict self-interest ($\overline{RSS}$ = 213.60), CD ($\overline{RSS}$ = 30.65), BO ($\overline{RSS}$ = 31.82), and FS ($\overline{RSS}$ = 20.64), all improve explanatory power significantly. The *SSR* of FS is also significantly lower than the *SSR* of an ordinary least squares model with individual fixed effects ($\overline{RSS}$ = 27.96, paired Wilcoxon test, $p < .01$). To put this in perspective, the mean absolute residual between these two models reduces from 4.14 points to 2.32 points, which seems considerably more accurate given that the subjects bargain over 72 points in total.

The data shows that subjects' transfers vary considerably across the different rounds (mean individual range of relative transfers = 0.30), in which they are systematically matched with different bargaining partners. Arguably, the observed variation of behavior stems from the interaction of other-regarding preferences, which aggregate in a non-trivial way. In sum, the propositions derived by applying social preferences proposed by Fehr and Schmidt (1999) to the

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[11] For each session I am searching for the parameters $P = (\delta_i, \vartheta_i, \beta_i)$, $i = (1, \dots, 16)$ of CD, BO, and FS which minimize $\sum_1^{120}(y - f(P))^2$, where y is the payoff share allocated to the third subject and f the Nash product of the respective functional form. To solve the non-linear functions, I use the R implementation of a particle swarm optimizer (Bendtsen 2012) and a simulated annealing process (Xiang et al. 2013).

Nash bargaining solution, match the observed bargaining outcomes descriptively well. Fitting the model shows that the predicted functional relationship explains the bargaining outcomes significantly better than alternatives. The results support the notion that disadvantageous inequality aversion toward the bargaining partner counteracts advantageous inequality aversion toward the excluded subject, which leads to bargaining outcomes with equal payoff shares between the bargaining partners.

5.2. Individual Behavior

In this subsection, I examine how bargaining behavior and behavior in isolation are related. Figure 5 shows the distribution of average transfers of the subjects during the bargaining game.[12] The average transfers are relatively uniformly distributed in both treatments, which means that some subjects transfer more, and some subjects transfer less during the negotiations. This implies that some participants have stronger preferences during bargaining despite the variance across bargaining rounds. The central tendency of the average transfers is again not significantly different between the two treatments (Mann-Whitney test, $p = .14$).

[Figure 5 about here]

To provide evidence that the bargaining behavior is driven by heterogeneous other-regarding preferences, as suggested by the theory, I compare the behavior in the bargaining game with the behavior observed in isolation. The switching points of the two blocks of EET - DIB, and AIB - provides information on a continuous scale over advantageous and disadvantageous inequality aversion of the subjects. The median switching point of the subjects who bargained lies at 3 out of 5 in DIB and 5 out of 8 in AIB. Subjects' transfers in the three-player dictator game give another continuous measure over the distribution preferences, which arguably resembles the decision architecture in the bargaining game more closely. The dictators in the sample allocate on average 23.8 percent of the payoff share to a recipient. As in previous experiments, the accumulation points lie at zero and at the three-way even split, even though the transfers of the bargaining subjects are

[12] Logically, the fitted individual other-regarding weights (of FS) correlate strongly with the average payoff share transferred to the third subject during the negotiations (Pearson corr. = .87, $p < .01$). In the following, I will focus on the latter, since I do not have to account for the remaining error between actual and predicted values. When I use the fitted individual other-regarding weights as the dependent variable in the following analysis, all results remain robust.

overall relatively high.[13] The Pearson correlation between the lower transfer in the dictator game and the switching point in AIB is 0.25 (p = .01).

Accordingly, regressions I – IV in Table 2 explains the average transfers in the bargaining game through the revealed other-regarding preferences in isolation controlled for fixed effects on the session level. I control for session fixed effects since subjects interact in their session and may develop norms over the course of the experiment. Further controls include observable traits, such as gender, age, field of study, experience in experiments, and self-reported characteristics, such as risk preferences, bargaining skills, assessment on a political left-right scale, assertiveness, trust, compassion, and respectfulness.

[Table 2 about here]

The results suggest that subjects who transfer higher payoff shares in the dictator game also transfer more during the bargaining game, which means that we can observe behavioral consistency across the different games. Furthermore, in line with theoretical considerations, advantageous inequality aversion (AIB) has a statistically significant relation, while disadvantageous inequality aversion (DIB) has no explanatory power in the bargaining game. The regression results remain robust if I control for further characteristics as controls, of which only subject's respectfulness is weakly significant (p = .08). The control variables remain statistically insignificant if I remove the incentivized other-regarding measures from the regression.

To explore the empirical relation between the dictator game and bargaining behavior further, I examine the separate bargaining outcomes. Regressions V – VII in Table 2 shows the effect of the transfers in the dictator game on the mutual transfer in the bargaining game in a Tobit regression with session fixed effects. By differentiating between the lower and higher transfer in the dictator game in regression VI, I can measure the influence of the more selfish subject on the agreed upon transfer. In regression VII, I differentiate between the influence of proposers' and receivers' social preferences on the agreed upon transfer. The Tobit models are censored at zero and shall account for the relatively high number of bargaining partners who transfer nothing to the third subject, who

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[13] While the bargaining outcomes between the treatments are relatively similar, there is weak evidence that the mean transfer in the B-I treatment is higher than in the I-B treatment (Mann-Whitney test, p = .09), which means that subjects transfer more if they play the dictator game after the negotiations. The ordering effects may be explained by subjects with other-regarding preference who try to equalize anticipated inequalities from the previous bargaining game in the B-I treatment.

might even have taken payoff away if they would have had the option. Interactions between the preferences of the two bargaining partners and the effects of the bargaining round are not shown here but have no explanatory power.

The results show that more selfish subjects do not have a significantly stronger influence on mutual transfer than more prosocial subjects. Interestingly, however, the influence of the proposers' preferences on the final agreement is significantly stronger than the receivers' preferences, which is theoretically not anticipated. This implies that receivers are more likely to depart from their initial preference, though, their transfer in the dictator game is still predictive ($p < .01$). Consecutive analyses show a tendency that subjects who perceive their own bargaining skills to be relatively better are more often proposers of the final agreement (Poisson regression with session fixed effects, $p = 0.10$). Moreover, subjects who report being more risk-averse, on average accept distribution offers that deviate more from their preferences in isolation (OLS with session fixed effects, $p = 0.04$). These results are only tentative, however, since they do not remain robust once I include more controls in the regression analyses and may be subject to future investigation.

In sum, the data show that bargaining behavior and behavior in isolation are consistent, which suggests that other-regarding preferences indeed drive the bargaining results. In direct comparison, transfers to third individuals are higher in the individual dictator game than in the bargaining game on average, independent of whether the dictator game is played before or after the negotiations (paired Wilcoxon tests, $p < 0.01$). Another interesting difference is that individuals in isolation are less sensitive to disadvantageous inequality than they are during bargaining in dyads. Having to choose between two distributions, (36, 36, 0) and (18, 36, 18), where the first element in these vectors indicates the own payoff, 39.6 percent choose the latter distribution, even though this results in disadvantageous inequality.[14] In other words, the same subjects who share half of their own payoff in isolation, condition their transfers on the bargaining partner during the negotiations. Disadvantageous inequality aversion seems to be more prevalent in interactive settings. However, in these situations, it drives the results significantly.

[14] This results aligns with Panchanathan et al.'s (2013) observation that only 15 percent of their participants condition their transfers on the second subject when implementing the strategy method.

6. Conclusion

Whenever bilateral agreements directly or indirectly exert externalities on third actors, socially concerned actors may distribute own payoffs to them to compensate incurred inequalities. The question is, which deal can the bargaining partners make to take third actors into account and who is willing to forgo surplus to benefit the third actor. Individual economic interests usually complicate the analyses of distributional decisions in external environments. In this study, I examined group sharing with internal conflict in a controlled experimental environment to identify general behavioral patterns.

I find that preferences aggregate systematically in groups with internal conflict. In more than 90 percent of the negotiations, the payoff shares are even between the bargaining partners. Subjects care about how much payoff is allocated to third subjects, but they also care about how a fair distribution is reached. Transfers to third actors are conditional on both bargaining partners (and not independent of each other) since unilateral transfers would increase inequality between bargaining partners. In other words, sharing with internal conflict involves two conflicting fairness aspects and a bargaining solution has to respect both. If the distributional preferences conflict between the bargaining subjects, the outcome depends on the individual who has stronger preferences. Both, self-interested and prosocial subjects can enforce their preferences. The properties of the distribution outcome of groups with internal conflict can best be explained by assuming pairwise inequality aversion (Fehr and Schmidt 1999).

Due to the general and abstract design of the experiment, the results offer new perspectives on previously observed results. First, the results fit survey observations regarding policy preferences during the refugee crises (Bansak et al. 2017) and increase their understanding based on empirical evidence in an incentivized experiment. Second, the results offer a new perspective on exchange behavior in externality producing experimental markets. On the one hand, conditional altruism might explain why the burden to decrease negative externalities on third actors is shared equally among market participants (Bartling et al. 2015). On the other hand, the results offer additional insights why fairness values decrease in markets, which has so far been primarily ascribed to responsibility diffusion but eventually has to be attributed to intersubjective fairness concerns. Third, the data might explain why "communication among dictators did not actually help recipients [and] the bystander effect persisted" in a dictator game with two dictators and one recipient. Panchanathan, et al. (2013:293), who examined whether the bystander effect can be overcome by communication, wonder “why communication had so little effect on dictator behavior“. The answer may be that communication does not help to overcome the problem of conditional altruism since individuals are also reluctant to help third individuals if it creates inequalities between the dictators.

It is important to highlight that the presented results are prevalent in cooperative, interactive games, i.e. situations where people decide through interaction. Using the strategy method, the results cannot be replicated (Panchanathan et al. 2013). This result also matches the observation of studies on externality producing markets, which find that people behave differently on the market than as a single dictator, even if the decision incentives are equivalent (Bartling et al. 2015).

Altogether, group sharing with internal conflict can decrease and increase transfers of single group members to third actors depending on the bargaining partner with the strongest preferences in the group, as transfers align. Whether one or the other should be facilitated through institutional design is ultimately a normative question. However, the question of how outcomes are influenced by institutional factors in this setting offers interesting future research directions. Future research could examine how the disagreement point, merit, or a shared social identity changes outcomes and bargaining dynamics, since variation potentially leads to severe outcome differences. Furthermore, it would be interesting to examine whether the results of groups with internal conflict presented here are robust to larger group size and whether median preferences predict the outcome.

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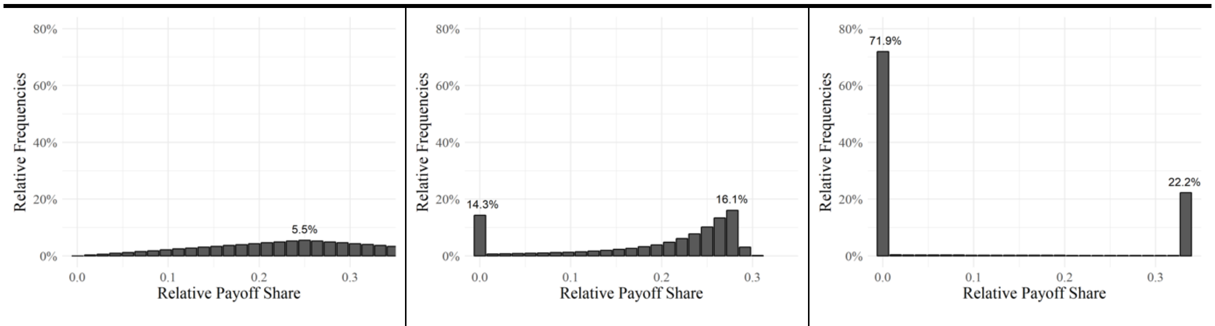
8. Figures and Tables

Figure 1. Simulated outcomes: Payoff share of the third individual



Cobb-Douglas (**CD**):	Inequality Aversion (**BO**):	Pairwise Inequality Aversion (**FS**):
$u_i(x) = x_i^{1-\delta_i} x_j^{\delta_i/2} x_k^{\delta_i/2}$,	$u_i(x) = x_i - \vartheta_i ({}^{x_i}/_{v} - {}^{1}/_{3})^2$,	$u_i(x) = \left(1 - w_j - w_k\right) x_i + w_j x_j + w_k x_k$,
$\delta_i \in U(0, {}^{2}/_{3})$, $v = 72;$	$\vartheta_i \in U(0{,}1800)$, $v = 72;$	$\beta_i \in U(0{,}1)$, $v = 72;$

Predictions are rounded to $1/72$.
Pairwise inequality aversion weights: $w_j = \{-\alpha_i/2, if\ x_i < x_j; \beta_i/2, if\ x_i \geq x_j;\}$, where $\beta_i \leq \alpha_i$ and $0 \leq \beta_i < 1$.

Figure 2. Predicted agreement depending on FS better-off weights.

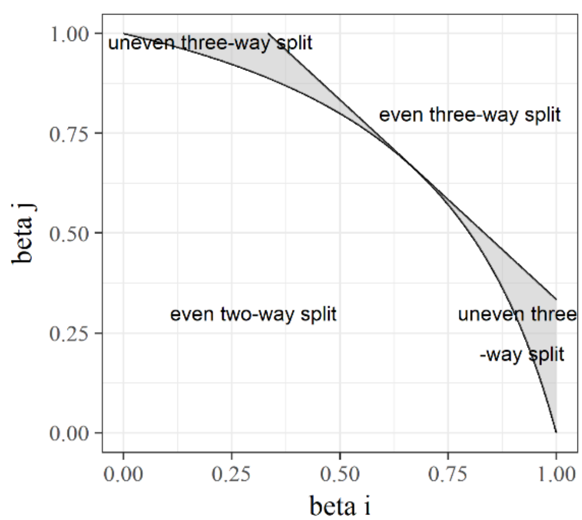


Figure 3. Payoff share of the third actor over time.

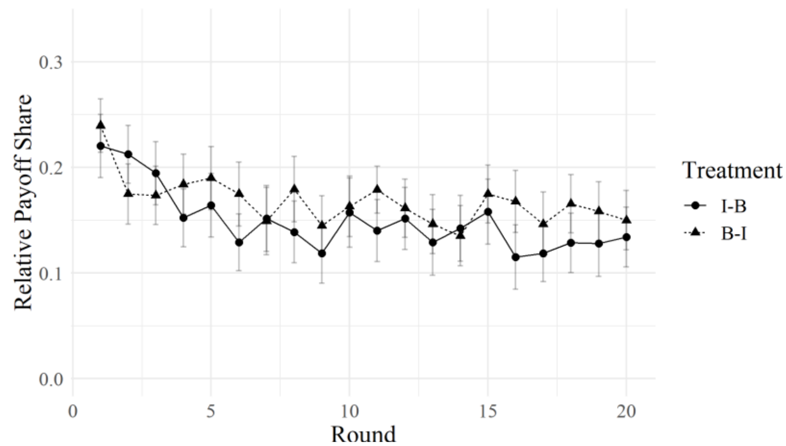
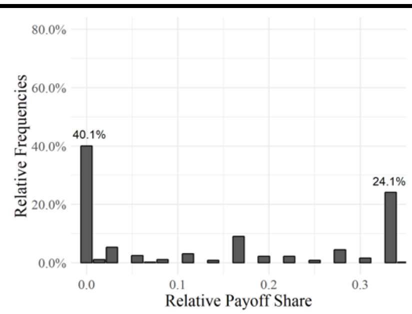
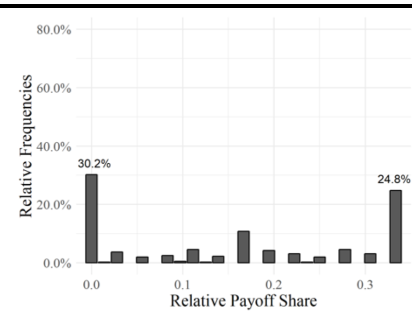


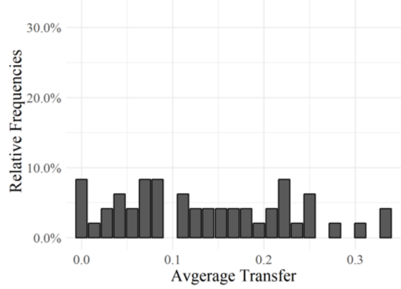
Figure 4. Outcome distribution: Payoff share of the third individual.

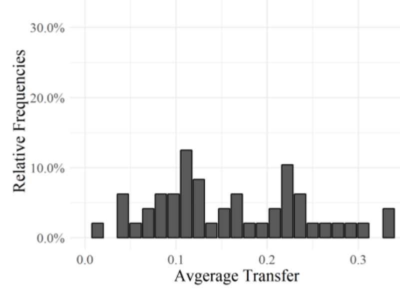




I-B Treatment	B-I Treatment

Figure 5. Avg. transfer negotiated by individuals.





I-B Treatment	B-I Treatment

Average transfers between round 6 to 20 rounded to 1/72.

Table 1. Frequency of divisions.

Payoff between negotiators	Payoff share of the third individual									
	I-B Treatment					B-I Treatment				
	[0]	(0-⅓)	[⅓]	(⅓-1]	∑	[0]	(0-⅓)	[⅓]	(⅓-1]	∑
Even split	.347	.307	.241	.003	.898	.242	.416	.248	.006	.912
Uneven split	.054	.045	.000	.003	.102	.060	.028	.000	.000	.088
Sum	.401	.352	.241	.006		.302	.444	.249	.006	

Table 2. Relation between individual and bargaining behavior.

Dependent variable:	Avg. bargaining transfer				Bargaining transfer		
	I	II	III	IV	V	VI	VII
Dictator game	0.249***		0.210***	0.241***	0.414***	0.511***	0.599***
	(0.058)		(0.059)	(0.0660)	(0.042)	(0.122)	(0.055)
AIB		0.830***	0.583**	0.520*			
		(0.269)	(0.263)	(0.280)			
DIB		0.382	0.209	0.273			
		(0.378)	(0.359)	(0.430)			
Dict. game x Low						-0.129	
						(0.152)	
Dict. game x Receiver							-0.397***
							(0.076)
Controls	No	No	No	Yes	No	No	No
Sigma	-	-	-	-	0.173***	0.173***	0.169***
					(0.026)	(0.006)	(0.006)
Observations	96	96	96	96	703	703	703
R^2 / Pseudo R^2	0.174	0.107	0.220	0.297	0.686	0.688	0.786
F Statistic / LR-χ^2	18.705***	5.291***	8.196***	2.023**	184.88***	185.61***	212.05***

I-VII: Fixed effects on session level. V-VII: Tobit regressions, lower limit at zero.
*** p < .01, ** p < .05, * p < .10.

9. Appendix

Table A1. Elicitation of individual preferences.

	Left Option				Right Option				
	Me	**Pers. 2**	**Pers. 3**	**Results**	**Me**	**Pers. 2**	**Pers. 3**	**Chooses left first**	**Inequality aversion weights**
				Two-player allocation decisions					
1	15	30	-	6.2% **vs.** 93.8%	20	20	-	1	$\alpha \leq -1/3$
2	19	30	-	21.9% **vs.** 78.1%	20	20	-	2	$-1/3 \leq \alpha \leq -1/11$
3	20	30	-	68.8% **vs.** 31.2%	20	20	-	3	$-1/11 \leq \alpha \leq 0$
4	21	30	-	69.1% **vs.** 30.2%	20	20	-	4	$0 \leq \alpha \leq 1/9$
5	25	30	-	79.2% **vs.** 20.8%	20	20	-	5	$1/9 \leq \alpha \leq 1$
								Never	$1 \leq \alpha$
6	15	10	-	11.5% **vs.** 88.5%	20	20	-	1	$\beta \leq -1$
7	19	10	-	9.4% **vs.** 90.6%	20	20	-	2	$-1 \leq \beta \leq -1/9$
8	20	10	-	11.5% **vs.** 88.5%	20	20	-	3	$-1/9 \leq \beta \leq 0$
9	21	10	-	35.4% **vs.** 64.6%	20	20	-	4	$0 \leq \beta \leq 1/11$
10	25	10	-	57.3% **vs.** 42.7%	20	20	-	5	$1/11 \leq \beta \leq 1/3$
11	30	10	-	74.0% **vs.** 26.0%	20	20	-	6	$1/3 \leq \beta \leq 1/2$
12	40	10	-	82.8% **vs.** 17.7%	20	20	-	7	$1/2 \leq \beta \leq 2/3$
13	70	10	-	86.5% **vs.** 13.5%	20	20	-	8	$2/3 \leq \beta \leq 5/6$
								Never	$5/6 \leq \beta$
				Three-player allocation decisions				**main interest**	
14	18	36	18	39.6% **vs.** 60.4%	36	36	0	conditional altruism	
15	30	36	6	56.2% **vs.** 43.8%	36	36	0	conditional altruism	
16	30	30	12	66.7% **vs.** 33.3%	36	36	0	conditional altruism	
17	36	24	12	26.0% **vs.** 74.0%	36	18	18	alter-alter differences	
18	36	36	0	38.5% **vs.** 61.5%	24	24	24	conditional altruism	
19	72	0	0	45.8% **vs.** 54.2%	24	24	24	better-off weight	
20	0	36	36	5.2% **vs.** 94.8%	24	24	24	altruism	

Formal notes

We have individuals i, j, and k, where $i \neq j \neq k$. Former negotiate, latter is individual is excluded from the negotiations. Payoffs lie between zero and the full bargaining value, $0 \leq x_i \leq v$. Individuals i and j settle on an agreement according to

$$max\ \ u_i(x) * u_j(x) \text{ subject to } x_i + x_j + x_k = v, \tag{1}$$

where $u_i(x)$ is the utility of individual i.

Cobb-Douglas utility function:

$$u_i(x) = x_i^{1-\delta_i} x_j^{\delta_i/2} x_k^{\delta_i/2}, 0 \leq \delta_i \leq 1; \tag{2}$$

Using (2) in (1) and solving for x_k gives:

$$x_k = \frac{1}{4}\left(\delta_i + \delta_j\right)v \tag{3}$$

Bolton and Ockenfels (2000) utility function:

$$u_i(x) = x_i - \vartheta_i\left(\frac{x_i}{v} - \frac{1}{3}\right)^2, 0 \leq \vartheta_i; \tag{4}$$

Using (4) in (1) and solving for x_k gives:

$$x_k = \begin{cases} \left(\frac{1}{3} - \frac{v}{2}\left(\frac{1}{\delta_i} + \frac{1}{\delta_j}\right)\right)v & if\ \frac{\delta_i + \delta_j}{\delta_i \delta_j} < \frac{2}{3v} \\ 0 & otherwise; \end{cases} \tag{5}$$

Fehr and Schmidt (1999) utility function:

$$u_i(x) = \left(1 - w_j - w_k\right)x_i + w_j x_j + w_k x_k,$$

$$w_j = \begin{cases} \frac{-\alpha_i}{2} & if \quad x_i < x_{j,} \\ \frac{\beta_i}{2} & if \quad x_i \geq x_j; \end{cases}, \ w_k = \begin{cases} \frac{-\alpha_i}{2} & if \quad x_i < x_{k,} \\ \frac{\beta_i}{2} & if \quad x_i \geq x_k; \end{cases}, \beta_i \leq \alpha_i, 0 \leq \beta_i < 1; \tag{6}$$

Using (6) in (1) and solving for x_k gives:

$$x_k = \begin{cases} 0 & if \quad \beta_i + \beta_j \leq \frac{3}{4}\beta_i\beta_j + 1, \\ \left(\frac{3\beta_i\beta_j - 4(\beta_i + \beta_j) + 4}{9\beta_i\beta_j - 6(\beta_i + \beta_j) + 4}\right)v & if \quad \frac{3}{4}\beta_i\beta_j + 1 < \beta_i + \beta_j < \frac{4}{3}, \\ \frac{1}{3}v & if \quad \frac{4}{3} \leq \beta_i + \beta_j; \end{cases} \tag{7}$$

Note: $x_i = x_j$ vs. $x_i \leq x_j$, if $x_i > x_k$ and $x_j > x_k$

$$u_i(x_j, x_j, x_k) * u_j(x_j, x_j, x_k) < u_i\left((x_j - \varepsilon), x_j, (x_k + \varepsilon)\right) * u_j\left((x_j - \varepsilon), x_j, (x_k + \varepsilon)\right)$$

$$\leftrightarrow \left(x_j - \frac{1}{2}\beta_i(x_j - x_k)\right) * \left(x_j - \frac{1}{2}\beta_j(x_j - x_k)\right)$$
$$< \left((x_j - \varepsilon) - \frac{1}{2}\alpha_i\left(x_j - (x_j - \varepsilon)\right) - \frac{1}{2}\beta_i\left((x_j - \varepsilon) - (x_k + \varepsilon)\right)\right)$$
$$* \left(x_j - \frac{1}{2}\beta_j\left(x_j - (x_j - \varepsilon)\right) - \frac{1}{2}\beta_j\left(x_j - (x_k + \varepsilon)\right)\right) \leftrightarrow$$

$$1 + \tfrac{1}{2}\alpha_i < \beta_i$$

Individual i prefers to allocate payoff to individual k only if $1 + \frac{1}{2}\alpha_i < \beta_i$ holds. This conditions is in conflict with the assumptions $0 \leq \beta_i < 1$ and $\beta_i < \alpha_i$.

German instructions, treatment I-B:

Instruktionen

Herzlich willkommen! Sie und die anderen Experimentteilnehmerinnen und -Teilnehmer werden heute mehrere Entscheidungen treffen, in denen Sie Geld verdienen können. Es ist wichtig, dass Sie die Instruktionen sorgfältig durchlesen, damit Sie die Entscheidungssituationen vollständig verstehen.

Falls Ihnen beim Lesen etwas unklar erscheint oder falls Sie sonstige Fragen haben, so zeigen Sie das bitte per Handzeichen. Wir werden Ihre Fragen dann einzeln beantworten.

Bitte stellen Sie Ihre Frage(n) auf keinen Fall laut. Bitte sprechen Sie nicht mit anderen Teilnehmern und geben Sie keine Informationen an andere Teilnehmer weiter. Die Einhaltung dieser Regeln ist für den wissenschaftlichen Wert des Experiments sehr wichtig.

Am Ende des Experiments werden Sie einzeln, privat und in bar ausgezahlt. Jeder Teilnehmer erhält in jedem Fall eine pauschale Vergütung in Höhe von EUR 4,00. Wie viel Sie darüber hinaus verdienen, hängt von Ihren Entscheidungen und den Entscheidungen der anderen Experimentteilnehmer ab. Selbstverständlich bleibt Ihre Anonymität gegenüber anderen Teilnehmern während des gesamten Experiments gewahrt.

Während des Experimentes sprechen wir nicht von Euro, sondern von Punkten. Diese werden nach dem Experiment zu folgendem Wechselkurs umgerechnet:

1 Euro = 7 Punkte

Das Experiment besteht aus zwei Teilen. Auf den folgenden Seiten finden Sie die Instruktionen für den ersten Teil. Wenn der erste Teil abgeschlossen ist, erhalten Sie die Instruktionen für den zweiten Teil.

Instruktionen zum 1. Teil des Experiments

Teil 1 des Experiments besteht insgesamt aus 21 Entscheidungssituationen. Zunächst müssen Sie 13 Entscheidungen treffen. In jeder dieser 13 Entscheidungen wird Ihnen vom Computer zufällig ein anderer Experimentteilnehmer zugeordnet. Wir nennen den Ihnen zugeordneten Teilnehmer im Folgenden "Ihre Passive Person". Sie werden weiter unten sehen, wieso wir diese Person als "Passive Person" bezeichnen. Sie erfahren zu keinem Zeitpunkt die Identität Ihrer Passiven Person. Ihre Passive Person erfährt zu keinem Zeitpunkt Ihre Identität.

Jede Ihrer 13 Entscheidungen ist eine Wahl zwischen den Alternativen LINKS und RECHTS. Jede Alternative hat Konsequenzen für Ihre eigene Auszahlung und für die Auszahlung Ihrer Passiven Person.

Beispiel: Sie können gefragt werden, ob Sie lieber Alternative LINKS wählen, in der Sie ***19 Punkte*** *erhalten und Ihre Passive Person* ***30 Punkte****, oder Alternative RECHTS, in der Sie* ***20 Punkte*** *erhalten und Ihre Passive Person ebenfalls* ***20 Punkte*** *erhält. Sie müssen sich dann für eine der beiden Alternativen entscheiden. Dieses Entscheidungsproblem würde am Bildschirm wie folgt präsentiert:*

Alternative LINKS	Alternative LINKS	IHRE WAHL	Alternative RECHTS	Alternative RECHTS
Sie erhalten Punkte	Passive Person erhält Punkte	Hier Ihre Wahl anklicken	Sie erhalten Punkte	Passive Person erhält Punkte
19	30	LINKS ○ ○ RECHTS	20	20

Sie treffen insgesamt 13 solche Entscheidungen.

Ihr Verdienst wird wie folgt bestimmt:

Auszahlung als Aktive Person: Es wird für jeden Teilnehmer separat und zufällig eine der 13 Entscheidungssituationen ausgewählt und die in dieser Entscheidungssituation gewählte Alternative wird dann tatsächlich ausgezahlt. Würde z.B. die oben beschriebene Entscheidungssituation ausgewählt und hätten Sie sich in dieser Entscheidungssituation für die Alternative RECHTS entschieden, so erhielten Sie 20 Punkte als Aktive Person, während Ihre Passive Person 20 Punkte als Passive Person erhielte.

Auszahlung als Passive Person: Genau so wie Ihre Passive Person Punkte aus Ihrer Entscheidung erhält, ohne etwas dafür zu tun, erhalten Sie Punkte von einem anderen Experimentteilnehmer, ohne etwas dafür zu tun, d.h. Sie sind für diesen anderen Teilnehmer die Passive Person. Es wird sichergestellt, dass Ihnen als Aktive und als Passive Person nicht zwei Mal derselbe Teilnehmer zugelost wird. Das heißt, wenn die Person X ihre Passive Person ist, dann sind Sie sicher nicht die Passive Person von Person X.

Weitere Entscheidungssituationen

Nach den 13 Entscheidungssituationen müssen Sie wieder 7 Entscheidungen treffen. In diesen 7 Entscheidungen gibt es zwei Unterschiede zu den vorangegangenen Entscheidungssituationen.

Erstens gibt es nun **zwei Passive Personen** anstatt nur einer Passiven Person. Das heißt, Sie müssen nun zwischen den Optionen LINKS und RECHTS wählen, die für insgesamt drei Personen auszahlungsrelevant sind.

Zweitens wird für jeweils drei Personen nur **eine Person** zufällig bestimmt, deren zufällig ausgewählte **Entscheidung auszahlungsrelevant** ist. Dies bedeutet, dass für jeweils drei Personen eine Person aktiv entscheidet und zwei Personen passiv Punkte erhalten. Erst zum Schluss des Experiments wird aufgedeckt, welche Person aktiv und welche Personen passiv waren. Zunächst entscheidet jede Person, als ob sie aktiv wäre.

Zum Schluss des ersten Teils trifft nochmals jede Person eine Entscheidung. Hier kann die **Aufteilung der Punkte** auf drei Personen **frei gewählt** werden. Wieder wird nur eine von drei Person zufällig bestimmt, deren ausgewählte Entscheidung auszahlungsrelevant ist.

Zusammenfassung der Auszahlung des ersten Teils

- Aus den ersten 13 Entscheidungen wird von jeder Person eine Entscheidung zufällig ausgewählt und ausgezahlt. Sie erhalten einmal Punkte als Aktive Person *und* einmal Punkte als Passive Person.
- Aus den nächsten 7 Entscheidungen wird eine Person zufällig als Aktive Person bestimmt und deren ausgewählte Entscheidung ausgezahlt. Sie erhalten Punkte als Aktive *oder* Passive Person.
- Aus der letzten Entscheidung wird eine Person zufällig als Aktive Person bestimmt und deren ausgewählte Entscheidung ausgezahlt. Sie erhalten Punkte als Aktive *oder* Passive Person.

Insgesamt erhalten Sie demnach aus vier Entscheidungen Punkte. Wie viele Punkte genau und welche Entscheidungen von Ihnen und den anderen Personen zufällig ausgewählt wurden, erfahren Sie am Ende des Experiments, nach dem 2. Teil.

Bei Fragen heben Sie bitte die Hand.

Instruktionen zum 2. Teil des Experiments

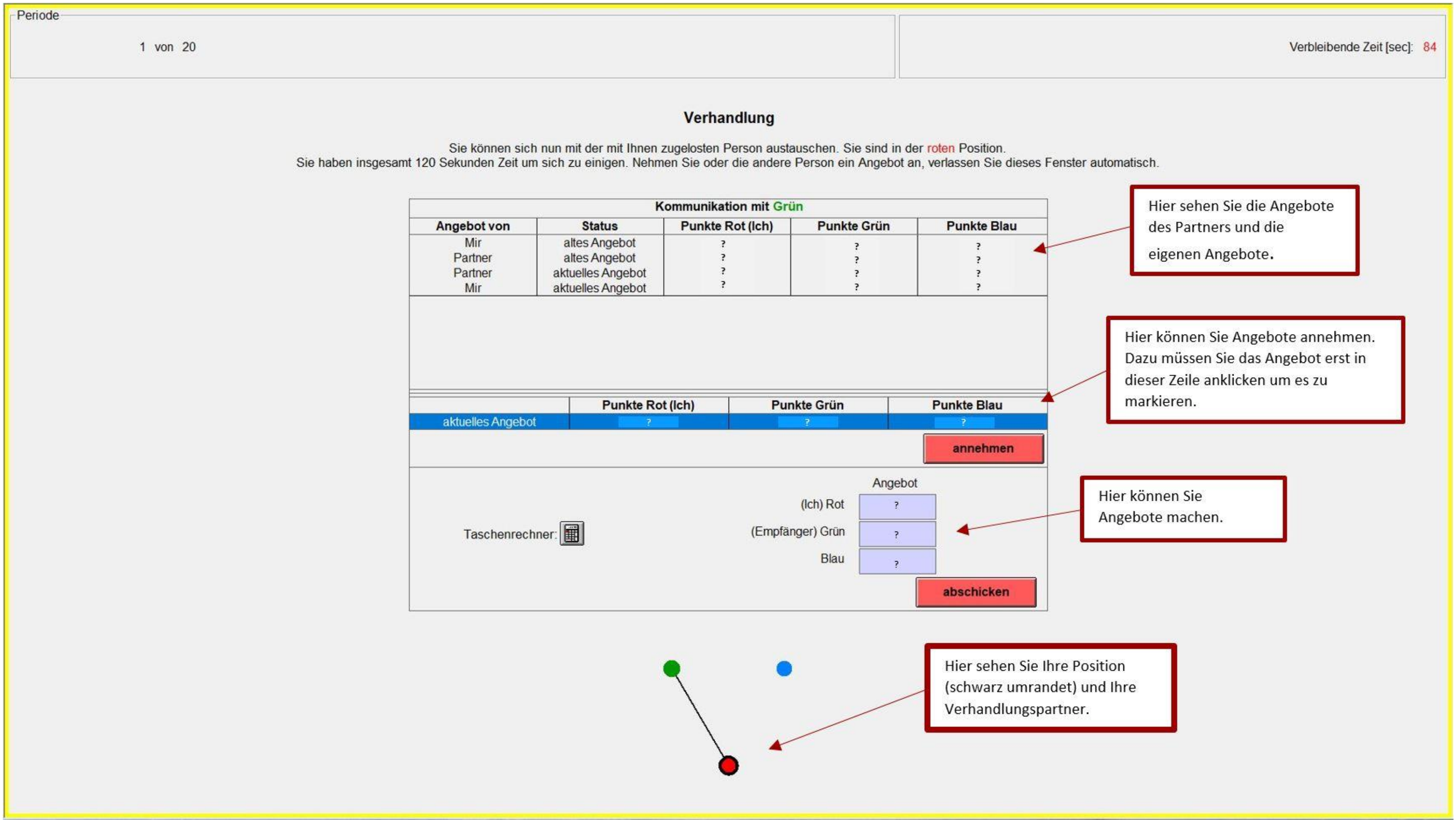
In diesem Experiment geht es darum auszuhandeln, wie 72 Punkte aufgeteilt werden sollen.

Dazu werden Sie in Gruppen zu **drei Personen** eingeteilt. Das Experiment besteht insgesamt aus **20 Runden**. In jeder Runde werden Sie einer neuen Dreiergruppe zugeordnet. Zur besseren Orientierung sind die verschiedenen Personen in den Dreiergruppen mit den Farben rot, grün und blau gekennzeichnet. Sie sehen sich selbst immer in der Farbe Rot, Ihren Verhandlungspartner in der Farbe Grün und die dritte Person in der Farbe Blau.

In jeder Runde verhandeln Sie und eine andere Person **über die Verteilung von 72 Punkten**. Die **Person** mit der Sie verhandeln und die dritte Person **ändern sich** in jeder Runde. Auf der nächsten Seite sehen Sie den Verhandlungsbildschirm. Die Kommunikation erfolgt über Eingabe-Fenster, in denen Sie Angebote über die Verteilung der 72 Punkte machen können. Sie können Angebote senden und Angebote von der anderen Person erhalten. **Erst nach Ablauf von 30 Sekunden können gesendete Angebote angenommen werden.** Es kann immer nur das aktuellste Angebot angenommen werden. Um ein Angebot anzunehmen müssen Sie es erst markieren, dadurch wird es blau hinterlegt, und dann auf den Button „annehmen“ drücken. Sie haben insgesamt **zwei Minuten Zeit**, um zu einer Einigung zu kommen. Die erste getroffene Einigung ist für alle gültig. Wenn Sie sich in den zwei Minuten **nicht einigen**, erhält jede der drei Personen in jedem Fall **null Punkte**.

In der ersten Runde erfahren Sie, ob Sie einer der Verhandlungspartner sind oder nicht. Nachdem die Positionen in der ersten Runde zufällig bestimmt wurden, ändern sie sich im gesamten Experiment nicht mehr. Personen, die nicht als Verhandlungspartner ausgewählt werden, verhandeln trotzdem über die Verteilung von 72 Punkten, allerdings ausschließlich mit Personen, die auch nicht Verhandlungspartner sind. Die Einigungen sind in diesem Fall rein hypothetisch und nicht auszahlungsrelevant. Auszahlungsrelevant sind immer nur die Einigungen der zugeordneten Verhandlungspartner.

Für die Auszahlung sind nur drei der 20 Runden relevant. Welche der Runden ausgewählt werden, wird zufällig bestimmt. Die Wahrscheinlichkeit, für die Auszahlung ausgewählt zu werden, ist für jede einzelne Runde gleich. Es kann jedoch keine Runde zweimal ausgewählt werden. Am Ende des Experiments werden also **drei Runden zufällig ausgewählt** und Sie bekommen die Anzahl der Punkte aus den Entscheidungen dieser Runden **in Euro ausbezahlt**.



Periode
1 von 20
Verbleibende Zeit [sec]: 84
Verhandlung
Sie können sich nun mit der mit Ihnen zugelosten Person austauschen. Sie sind in der roten Position.
Sie haben insgesamt 120 Sekunden Zeit um sich zu einigen. Nehmen Sie oder die andere Person ein Angebot an, verlassen Sie dieses Fenster automatisch.
Kommunikation mit Grün
Angebot von
Status
Punkte Rot (Ich)
Punkte Grün
Punkte Blau
Mir
altes Angebot
Partner
altes Angebot
Partner
aktuelles Angebot
Mir
aktuelles Angebot
aktuelles Angebot
annehmen
Angebot
(Ich) Rot
(Empfänger) Grün
Blau
Taschenrechner:
abschicken
Hier sehen Sie die Angebote des Partners und die eigenen Angebote.
Hier können Sie Angebote annehmen. Dazu müssen Sie das Angebot erst in dieser Zeile anklicken um es zu markieren.
Hier können Sie Angebote machen.
Hier sehen Sie Ihre Position (schwarz umrandet) und Ihre Verhandlungspartner.

Abschluss

Am Ende des Experiments folgt ein Fragebogen. Bitte nehmen Sie sich für die Beantwortung des Fragebogens Zeit. Für einen komplett ausgefüllten Fragebogen bekommen Sie **40 Punkte**.

Die in den einzelnen Teilen verdienten Punkte werden zusammengezählt und mit dem Faktor 7:1 in Euro umgerechnet. Dieser Betrag wird Ihnen am Ende des Experiments in bar ausgezahlt.

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– Latest Contributions

2018:

Bauer, Alexander Max: Sated but Thirsty. Towards a Multidimensional Measure of Need-Based Justice. Working Paper Nr. 2018-03. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2018-03.pdf

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2017:

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Kittel, Bernhard, Tepe, Markus and Lutz, Maximilian: Expert Advice in Need-based Allocations. Working Paper Nr. 2017-24. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-24.pdf

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Chugunova, Marina, Nicklisch, Andreas and Schnapp, Kai-Uwe Redistribution and Production with the Subsistence Income Constraint: a Real-Effort Experiment. Working Paper Nr. 2017-18. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-18.pdf

Nullmeier, Frank: Perspektiven auf eine Theorie der Bedarfsgerechtigkeit in zehn Thesen. Working Paper Nr. 2017-17. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-17.pdf

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