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## Does entitlement crowd out efficiency or equality seeking? Selling the roles in generosity game experiments

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# JENA ECONOMIC RESEARCH PAPERS



# 2010 – 091

## **Does Entitlement Crowd Out Efficiency or Equality Seeking? - Selling the Roles in Generosity Game Experiments -**

by

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## Does Entitlement Crowd Out Efficiency or Equality Seeking?

– Selling the Roles in Generosity Game Experiments –

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**Abstract** In generosity games, one agreement payoff is exogenously given, whereas the other is endogenously determined by the proposer's choice of the "pie" size. This has been shown to induce pie choices which are either efficiency or equality seeking. In our experiment, before playing the generosity game, participants are asked to buy their role via a random price mechanism. This should entitle them to exploit the chances which their role provides and at the same time avoid the selection bias of competitive auctions. We find that entitlement crowds out equality seeking and strengthens efficiency seeking. Interpreting participants' willingness to pay as an aspiration level of how much they want to earn, our design further allows us to test for satisficing behavior. Indeed, we find evidence for satisficing behavior in the data.

**Keywords** Entitlement · Generosity Game · Efficiency Seeking · Inequity Aversion · Satisficing

**JEL Classification** C7, C91, D03

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## 1 Introduction

One of the most serious drawbacks of experimental economics is its so-called "distribution of manna from heaven" tradition: player roles are typically randomly assigned to participants, which seriously questions the internal and external validity of laboratory research. Among the few exceptions from the manna-from-heaven tradition are (i) experiments where player roles are auctioned off (Güth and Schwarze 1983; Güth and Tietz 1986), (ii) advanced production or reward allocation experiments where participants first produce what they may later distribute (e.g., Mikula 1973; Gantner et al. 2001; Hackett 1963; Königstein 2000), (iii) real effort experiments where entitlement is not induced by monetary investments but rather by some real effort task, and (iv) experiments where roles are assigned according to a quiz score unrelated to the game situation (e.g., Hoffman and Spitzer 1985).

In our experiment, we follow the first avenue for inducing entitlement, but we do so by employing the incentive compatible random price mechanism (Becker et al. 1964), thereby avoiding the selection effect of competitive auctions.<sup>1</sup> The random price mechanism implies incentive compatibility when given values of strategic roles are assumed.

The specific game whose roles are auctioned off by an idiosyncratic random price auction for each participant is the so-called generosity game (Güth et al. 2009), which is especially suitable for studying whether participants care more about equality of payoffs than about efficiency. Much like in the ultimatum game, there are also two players in the generosity game: a proposer and a responder. However, unlike in the ultimatum game, the proposer's agreement payoff is fixed in advance. What the proposer chooses instead is the size of the pie. With the responder being the residual claimant,<sup>2</sup> the proposer's pie choice determines the agreement payoff of the responder. Hence, in generosity games, there is no trade-off between being generous or opportunistic.

Generosity games resemble situations where one party can only earn a given "fee" but can render the deal more profitable for the other party. If, for instance, the proposer can give worse or better advice by investing the same effort, the situation closely resembles that in a generosity game. As Güth et al. (2009) have shown, the two-person generosity game setting induces pie choices which are either efficiency or equality seeking. Proposers either display "generosity" by choosing the maximal (=efficient) pie size or aim at payoff equality by choosing the pie size which is twice as large as their own predetermined agreement payoff.

Is the predominance of efficiency rather than equality seeking an artifact of the manna-from-heaven aspect of the Güth et al. (2009) experiment, and will the often claimed inequality aversion (e.g., Fehr and Schmidt 1999; Bolton

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<sup>1</sup> Competitive auctions often imply that the experimenters collect a higher auction price sum than what auction winners collectively earn by playing the game since only the most ambitious participants acquire the role.

<sup>2</sup> For a theoretical and experimental study of three-person generosity games where either the responder or a third "dummy" player is the residual claimant, see Güth et al. (2010).

and Ockenfels 2000) dominate if entitlement is properly induced? In our view, we provide an important robust test for an influential concept for which the generosity game is especially suited. More generally, our study is designed to contribute to the hitherto rather scarce literature on how experimentally observed behavior depends on properly induced entitlement. To the best of our knowledge, our study is so far the only one testing the entitlement effect repeatedly, i.e., how it is shaped by learning and experience.

In our experiment, we ask whether entitlement via the use of a random price mechanism will change behavioral patterns and crowd out either efficiency or equality seeking in the generosity game. What we observe is, in fact, the latter: when the roles of the generosity game are auctioned off in advance, participants care more about efficiency than about equality. Thus, departing from the manna-from-heaven tradition and inducing entitlement crowds out equality seeking and crowds in efficiency seeking in the generosity game.

Interpreting participants' willingness to pay for their role in the random price auction as their aspiration level for what they want to earn in the subsequent generosity game further allows us to test satisficing behavior (Simon, 1955). We do, in fact, find support for such behavior in our data in the sense that participants bid less than they are likely to earn. Further, asking participants for hypothetical bids for the other role, we find what we call "mutual satisficing" in the sense of (i) proposers choosing pie sizes that are larger or equal to the sum of their own and their hypothetical bid, and (ii) responders complying with pie choices being larger or equal to the sum of their own and hypothetical bids. Concerning aspiration and bid formation in general, we observe a considerable amount of cautiousness.

The paper is organized as follows. In section 2, we describe our design, experimental procedures and present our hypotheses. In section 3, we analyze the data with reference to our hypotheses. Section 4 concludes.

## 2 Design, procedures, and hypotheses

### 2.1 Design and experimental procedures

In the two-person generosity game experiment, participants are either in the role of  $X$ , the proposer, or in the role of  $Y$ , the responder. Proposer  $X$  first chooses the pie size  $p \in [\underline{p}, \bar{p}]$  which responder  $Y$ , after being informed about this choice, then either accepts,  $\delta(p) = 1$ , or rejects,  $\delta(p) = 0$ . We imposed  $0 < x < \underline{p} < 2x < \bar{p}$  with  $x$  denoting the exogenously given agreement payoff of proposer  $X$ . The payoffs for all possible plays  $(p, \delta(p))$  are  $\delta(p)x$  for  $X$  and  $\delta(p)(p - x)$  for  $Y$ .

In order to play the game as player  $i = X, Y$ , each participant  $i$  first submits a bid  $b_i \in [0, B_i]$ , with  $B_i < \bar{p}$  facing a random price mechanism: a random variable  $r_i \in [1, B_i - 1]$  is drawn according to a uniform density function, and  $i$  acquires the right to play in the role of player  $i = X, Y$  if and only if  $r_i \leq b_i$ . In this case, the  $i$ -participant then pays the random price  $r_i$ ,

which is subtracted from what he earns in the role of player  $i$ . If, however,  $r_i > b_i$ , then the  $i$ -participant does not acquire the right to play and thus neither earns from acting in the role of player  $i$  nor has to pay anything. Clearly, this incentive compatible mechanism should induce an  $i$ -participant to bid his certainty equivalent<sup>3</sup> for the prospect of playing the generosity game in the role of player  $i = X, Y$ . For  $X$  the only uncertainty is whether the choice of  $p$  will be accepted;<sup>4</sup> for  $Y$  the certainty equivalent is  $(p - x)$  if  $Y$  is only interested in the own payoff.

In our experiment, we implemented the generosity game in its normal form in order to obtain more informative strategy data. More specifically, we first randomly assigned the roles  $i = X$  and  $i = Y$  for which a participant could bid (half of the participants for the  $X$ -role and half for the  $Y$ -role). The  $i$ -participants, knowing the role  $i = X, Y$  for which they were to bid, were then asked for their bids  $b_i$ . Knowing their own bid but not whether it had been successful ( $r_i \leq b_i$ ) or not ( $r_i > b_i$ ),  $X$ -participants then chose the pie size  $p \in [p, \bar{p}]$ , and  $Y$ -participants, not knowing whether their bid was successful and which  $p$  had been chosen by  $X$ , decided for all possible pie choices  $p$  whether to accept them ( $\delta(p) = 1$ ) or not ( $\delta(p) = 0$ ).

After this strategic interaction, we determined for all  $i$ -participants whether they bought their role  $i$  or not. Participants, who did not buy, just earned their show-up fee while participants, who acquired their role  $i = X, Y$ , were randomly matched with a  $j$ -participant ( $i, j = X, Y, j \neq i$ ), who acquired the other role.<sup>5</sup> After computing the payoffs in the generosity game, as determined by the strategies of this  $i$ - and  $j$ -participant, individual costs were subtracted and the resulting payoffs paid out.

This describes the main aspects of the experimental protocol (see the appendix for more details), according to which individual bids  $b_i$  remain private information, which, in our view, provides a best-case scenario to observe equal game payoffs in the sense of  $p = 2x$ , i.e.,  $(p - x) = x$ . To render the strategy method applicable for responder  $Y$ , only integer pie choices  $p \in [p, \bar{p}]$  were allowed.

The costs  $r_i$  for acquiring role  $i = X, Y$ , may, of course, exceed what was subsequently earned in the generosity game, e.g., due to  $\delta(p) = 0$ . Possible losses were subtracted from the show-up fee or could be paid out of pocket when exceeding the show-up fee. Otherwise, participants had to work by fulfilling an additional task at the end of the experiment to cover their losses. However, this occurred only in two cases.

The experimental instructions (see appendix) first explain the random price mechanism and how it is used to elicit the willingness to pay and then intro-

<sup>3</sup> Assuming that this does not depend on the payments due to the use of the random price mechanism (see Horowitz 2006).

<sup>4</sup> According to the findings by Güth et al. (2009), from their "manna from heaven" experiment, this risk is negligible in the range  $p \geq 2x$ .

<sup>5</sup> As there might not have been an equal number of  $X$ - and  $Y$ -participants acquiring the  $X$ - resp. the  $Y$ -role in each session, we used the decision of some participants repeatedly but, of course, paying them only once, namely according to a randomly selected partner.

duce the rules of the generosity game. Subsequently, some control questions are asked to check whether the rules of the generosity game, of auctioning player positions, and the optimality (weak dominance) of truthful bidding are understood. The latter has been checked by a pre-phase with experimentally induced values to see whether participants actually understood that truthful bidding is optimal. The share of participants not deviating by more than one experimental currency unit (ECU) from the objective value is 62 percent, i.e., the majority of participants opted for truth-telling. Note that this pre-phase with exogenously induced true values avoids the problem of incentive compatibility if the true value depends on the random price and how it is generated (see Horowitz 2006).

The experiment was programmed in z-tree (Fischbacher 2007). We ran four sessions with 32 participants in three sessions and 31 in one session. In each session, participants played over 12 rounds, where we relied on a random strangers matching. More specifically, participants were partitioned into two matching groups of 16 participants each, 8 of them bidding for role  $X$  and 8 for role  $Y$ . Participants were only told that they would be rematched randomly and not that rematching was limited to smaller matching groups. 12 rounds lasted on average 25 minutes. The parameters were chosen to be  $x = 6$ ,  $\underline{p} = 7$  and  $\bar{p} = 17$ . Earnings, including a show-up fee of 2.50 euros and the earnings from the experimental pre-phase, ranged from 0.50 to 46.10 euros. On average, participants received 17.09 euros.

## 2.2 Hypotheses

Our first hypothesis concerns how entitlement affects the outcomes of the generosity game compared to Güth et al. (2009). Being aware that  $Y$ -participants possibly paid dearly for playing the game, we expect entitlement to crowd out equality concerns by player  $X$  and to crowd in efficiency seeking:

*Hypothesis 1:* Compared to the experiment with no entitlement, the equality mode  $p = 2x$  will become negligible, i.e., the distribution of pie choices by  $X$ -players will be single-peaked at  $p = \bar{p}$ , and  $Y$ -players will reject  $p$ -choices below  $2x$  more often than observed in the experiment without entitlement.

Our second and third hypotheses are concerned with bounded rationality in the form of satisficing behavior, where we view a participant's bid as the aspiration for what he wants to earn in the role for which he is bidding. This allows to explore satisficing in the sense of participants earning at least as much as they are ready to pay for their role, i.e., we expect bids to comply with  $b_x \leq x$  for  $X$ -players and with  $b_y \leq (p - x)$  for  $Y$ -players. This leads us to the following hypothesis:

*Hypothesis 2:* For  $i = X, Y$  we will observe satisficing in the sense that participants in the role of player  $i$  earn at least  $b_i$ .

"Mutual satisficing" in this sense would obviously require  $(b_x + b_y) \leq p$ . However, players did not know their counterpart's bid. Hence, we asked them for hypothetical bids to obtain the other role. Specifically, we asked: "Which  $\widehat{b}_y$  ( $\widehat{b}_x$ ) would you bid if you were a  $Y(X)$ -participant?" If motivated by mutual satisficing, proposers  $X$  will act according to  $(b_x + \widehat{b}_y) \leq p$  with  $\widehat{b}_y$  as their hypothetical bid for role  $Y$ , and responders  $Y$  will comply with  $(\widehat{b}_x + b_y) \leq p$  with  $\widehat{b}_x$  as their hypothetical bid for role  $X$ .

To be able to further explore whether or not participants entertain rational expectations concerning the behavior of the other player in the subsequent generosity game, we further asked participants what they expected their counterparts to do: Specifically, we asked proposers  $X$ : "Which responder strategy  $\delta(p)$  for your chosen  $p$ -value do you expect?" Responders  $Y$  were asked: "Which  $p$ -choice by  $X$  do you expect ( $\widehat{p}_y$ )?" Although these questions (including the preceding one on hypothetical bids) were asked in each round and one might expect that the participants would not answer them carefully, and although hedging confounds have been shown not to represent a major problem (see Blanco et al. 2009), we decided to refrain from incentivizing these questions, as it might have cognitively overburdened participants. Answering the questions regarding hypothetical behavior and the expected behavior of one's counterpart might have been considered as a "mental preparation" for deciding on own behavior.

Given that  $X$ -players face the uncertainty regarding the acceptance of the offered pie by  $Y$ -players and that  $Y$ -players do not know the pie size that their counterpart chose, both players might be inclined to bid less than their expected payoff. As the uncertainty regarding payoffs differs between roles, the sum of the actual bid and the hypothetical bid might also differ between proposers and responders. Concerning the sum of the actual and the hypothetical bid, we hypothesize:

*Hypothesis 3:* The sum of the actual bid  $b_x$ , resp.  $b_y$ , and the hypothetical bid  $\widehat{b}_y$ , resp.  $\widehat{b}_x$ , for the other role will be substantially lower than  $\bar{p}$  and possibly even lower than  $2x$ . How these sums are related to  $2x$ , however, might depend on the role.

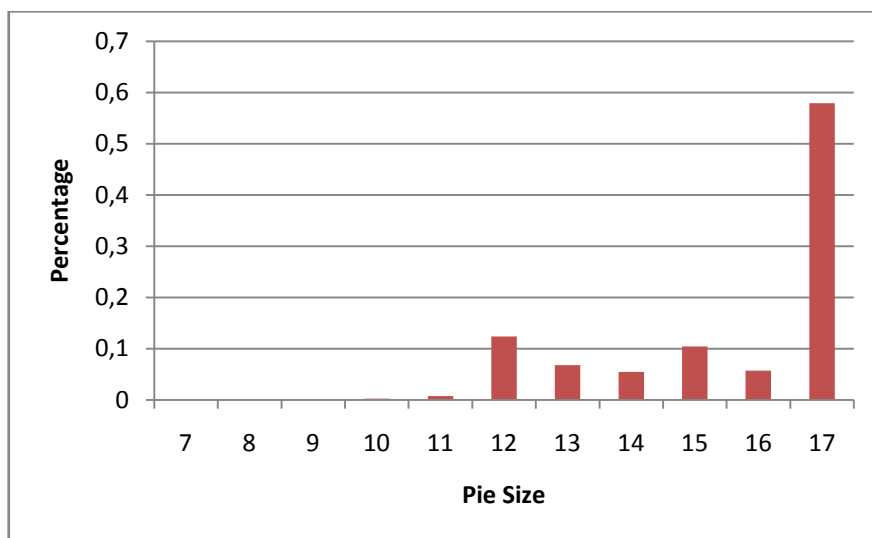
### 3 Results

#### 3.1 Pie choices: crowding out of equality seeking

Concerning Hypothesis 1, according to which we expect the choice of the equality mode  $p = 2x$  by player  $X$  to become negligible as compared to the experiment with no entitlement, we observe:

*Result 1.1:* In case of entitlement,  $p = 2x$  is chosen significantly less often than in the experiment without entitlement: with entitlement, only 12 percent





**Fig. 1** Percentages of chosen pie sizes,  $x = 6$

of proposers choose  $p = 2x$  (see Fig. 1) as compared to 40 percent in the experiment without entitlement by Güth et al. (2009). Applying a binomial test for  $\text{Prob}\{p = 2x\}$ , we found that crowding out of equality seeking is highly significant.

Concerning responders, according to Hypothesis 1, these will reject  $p$ -choices below  $2x$  more often than in the experiment without entitlement. This, too, is confirmed:

*Result 1.2:* Entitlement induces responders to use their veto power more often as compared to a situation without entitlement: Compared to the generosity experiment without entitlement, where only between 47 ( $p = 7$ ) and 12 ( $p = 11$ ) percent of responders reject pie sizes  $p < 2x = 12$ , responders in the generosity game with entitlement show substantially higher rejection rates for all pie sizes  $p < 2x = 12$  (e.g., the rejection rate for  $p = 7$  in the first round is 70 percent, and the one for  $p = 11$  is 22 percent(see Fig. 2)).

### 3.2 Bids: evidence for satisficing behavior

Concerning bids, on average more than 67 percent of  $X$ -participants bid less than  $x$ , 26 percent bid exactly  $x$ , and 7 percent bid more than  $x$ , risking a secure loss in case of  $r_i$  being below their bid but exceeding  $x$ . The average bid by  $X$ -participants amounts to  $b_x = 5.21$ , the median bid is given by  $b_x = 5.5$ . The respective figures for  $Y$ -participants are as follows: 59 percent bid less than  $x$ , 18 percent bid exactly  $x$  (i.e., they count on equality seeking proposers choosing  $p = 2x$ ), and 23 percent bid more than  $x$  (apparently

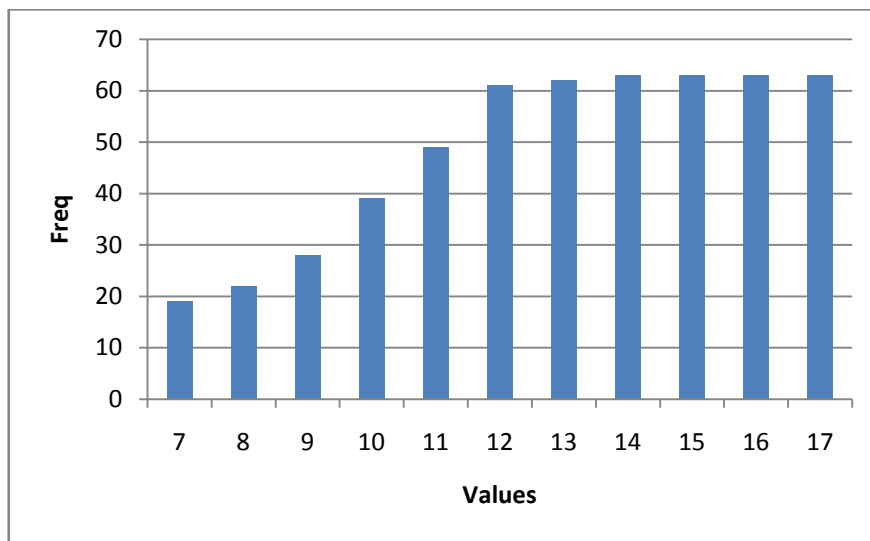


Fig. 2 Responders' acceptance rates (first round)

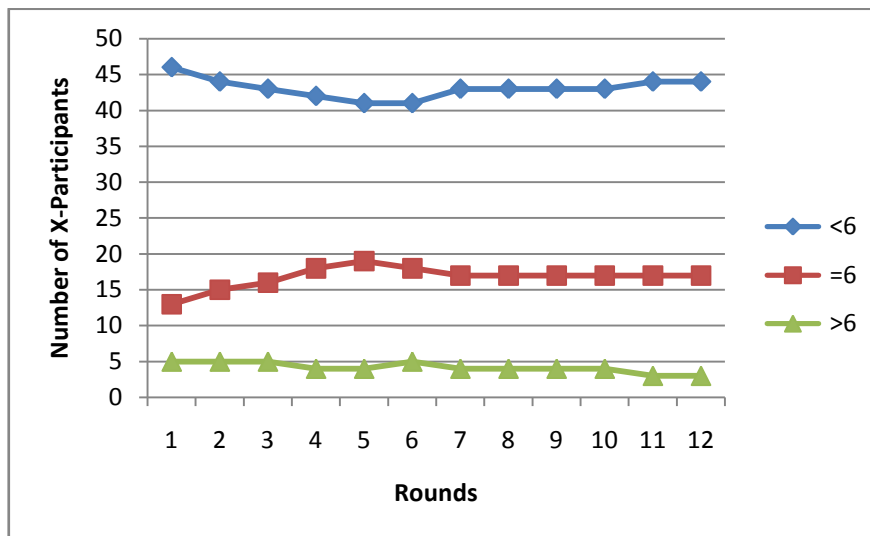


Fig. 3 Frequency of bids by X-participants over 12 rounds,  $x = 6$

hoping for efficiency seeking proposers). The average bid by Y-participants is  $b_y = 5.22$ , and the median bid is  $b_y = 5$ , respectively.

For X-participants there are no significant aggregate dynamics (see Fig.3). The distribution of bids  $b_x(t)$  does not differ significantly across rounds  $t = 1, \dots, 12$  according to a Mann-Whitney U test ( $p - value > 0.1$  for all  $t = 1, \dots, 12$ ). Bids  $b_x > x = 6$  might hint at X-participants assigning a positive

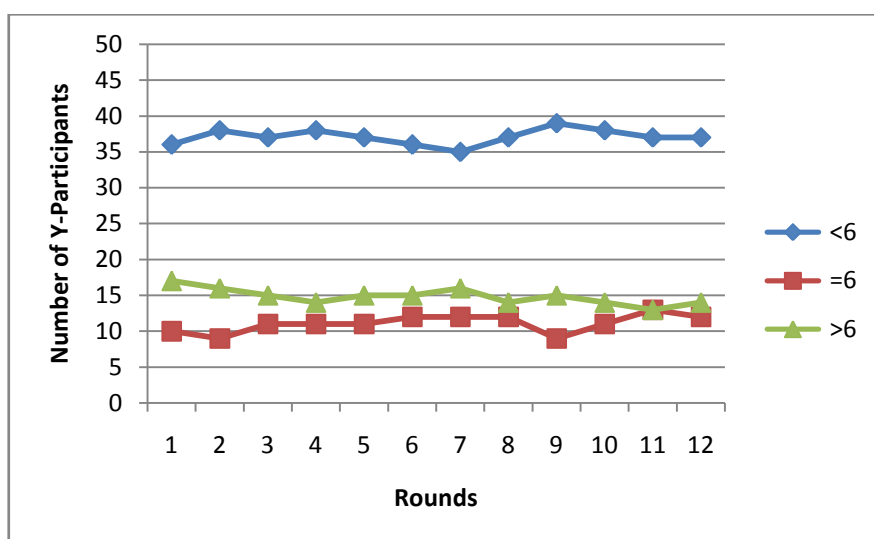


Fig. 4 Frequency of bids by Y-participants over 12 rounds,  $x = 6$ ,  $\underline{p} = 7$ ,  $\bar{p} = 17$

value to the opportunity of displaying generosity in the subsequent game, whereas bids  $b_x < x = 6$  might be rationalized by proposers taking into account the risk of  $\delta(p) = 0$ . As Figure 3 shows, there are only a few bids  $b_x > x$  compared to  $b_x \leq x$ .

Similarly, Y-participants on average do not increase their bids in later rounds (see Fig. 4). There are very few bids  $b_y(t)$  exceeding  $x = 6$  even in later rounds, i.e., responders Y do not anticipate proposer generosity as displayed in Figure 1.

In order to explore whether this is done in spite of  $\hat{p}_y > 2x$ , we compare the bids  $b_y \leq 6$  with the expectations  $\hat{p}_y$ , i.e., the expected pie choices and classify X- and Y-participants according to their bids (Table 1). The majority of participants in both roles bid less than what they expect to gain from the generosity game.

Table 1 Classification of bids according to expected counterpart strategy

	Relation	Frequency
X-Participant	$b_x \geq \hat{\delta}(p)x$	251
(for chosen $p$ )	$b_x < \hat{\delta}(p)x$	516
Y-Participant	$b_y \geq \hat{p}_y - x \geq 6$	98
	$b_y \geq \hat{p}_y - x < 6$	65
	$b_y < \hat{p}_y - x \geq 6$	568
	$b_y < \hat{p}_y - x < 6$	25

We were interested in whether  $X$ -participants would accept their own  $p$ -choice (only one exception in 768 cases) and  $Y$ -participants in general would accept their hypothetical  $p$ -choice, i.e.,  $\delta(\hat{p}_y) = 1$  (only 16 exceptions in 756 cases), i.e., the hypothetical and the actual choices in the generosity game are consistent for nearly all participants. For  $X$ -participants ambitious bids  $b_x \geq \hat{\delta}(p)x$  are observed in less than one third of all cases, i.e., most  $X$ -participants include a risk premium in their bid even for their own hypothetical responder choice. Similarly,  $Y$ -participants overwhelmingly expect the average  $X$ -participant to be less generous than their hypothetical  $p$ -choice  $\hat{p}_y$ . Therefore, we can safely state:

*Result 2:* In most cases we observe satisficing behavior in the sense that participants in the role of player  $i$  bid less than what they expect to earn.

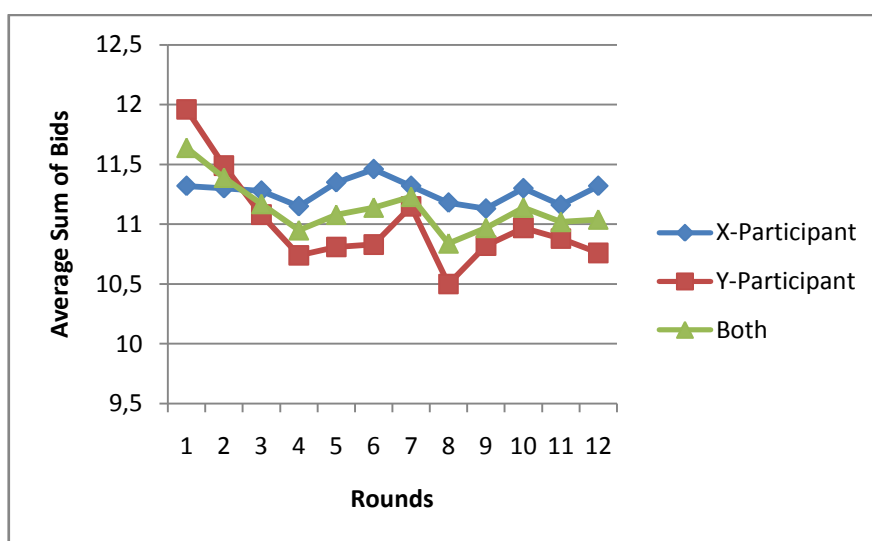
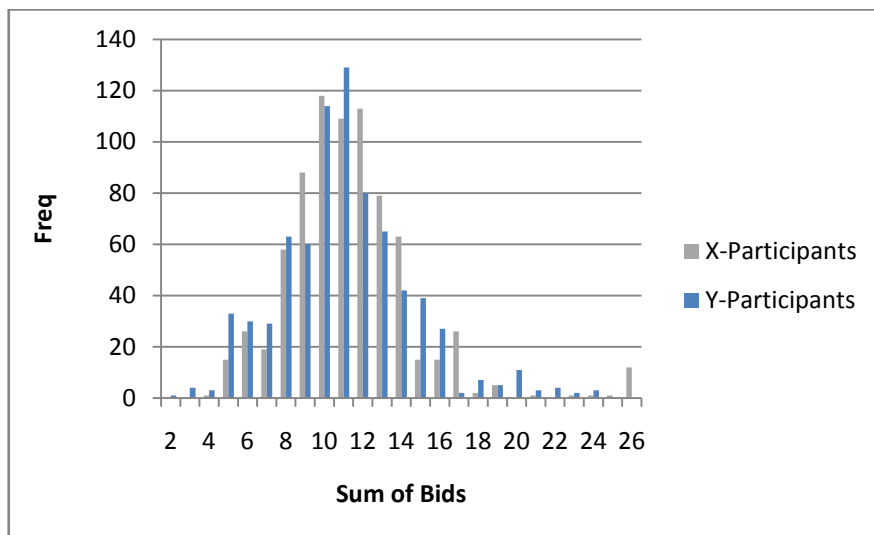


Fig. 5 Average sum of own actual bid and hypothetical bids (per round)

In the sense of "mutual satisficing", we observe the average own actual bid  $b_x$ , resp.  $b_y$ , and the average hypothetical counterpart bid  $\hat{b}_y$ , resp.  $\hat{b}_x$ , to add up to only 10.43. Hence, the sum is much smaller than  $\bar{p} = 17$  and also significantly smaller than  $2x = 12$  ( $p$ -value < 0.01). Hence, with reference to Hypothesis 3, we can safely state:

*Result 3.1:* The average sum of own actual and hypothetical bids is usually smaller than  $2x = 12$  (see Fig. 5), i.e., it is smaller than what participants would receive in case of equality. Furthermore, the sum of the two bids by  $Y$ -participants is significantly lower than the sum of the two bids by

$X$ -participants ( $p$ -value  $< 0.06$ ).  $Y$ -participants apparently do not fully anticipate the strong efficiency seeking by  $X$ -participants as illustrated by Figure 1.



**Fig. 6** Distribution of sums of own actual bid and hypothetical bids

Figure 6 explores the distribution of the bid sums, separately for  $X$ - and  $Y$ -participants, in more detail: low sums are more often observed for  $Y$ - than for  $X$ -participants. Apparently,  $Y$ -participants fear spiteful  $X$ -participants. Efficiency (sum of bids equal to 17) is a minor peak for  $X$ -participants but not for  $Y$ -participants, whereas the massive concentration of the sum of bids for both types of participants is close to  $2x = 12$ . Thus, we can safely state:

*Result 3.2:* When bidding for their own and hypothetically for the other role, both  $X$ - and  $Y$ -participants are mainly focusing on equality, with  $Y$ -participants being less confident, however.

#### 4 Conclusions

In two-person generosity game experiments, proposer participants either display generosity by choosing the maximal pie size or prove to be equality seeking by choosing a pie size resulting in equal agreement payoffs for both. Compared to the findings of standard ultimatum games, where offers smaller than 25 percent of the proposer's payoff are frequently rejected (see, e.g., Camerer 2003), acceptance rates in the generosity experiments without entitlement are rather high.

In this study, we have explored whether and how role entitlement and experience, especially with entitlement induction, affects proposer and responder behavior in generosity experiments. Participants were randomly assigned to either role for which they could bid, facing an incentive compatible random price auction, which avoids the selection effect of competitive auctions. We could convincingly confirm our main hypothesis that participants who have to pay dearly for their role display more generosity (proposers) and more often reject truly unfair offers of pie choices  $p < 2x$  (responders). Furthermore, in line with satisficing, average payoff aspirations, as revealed by bids, are rather moderate and below average, i.e., actual and expected, earnings.

The fact that most (fair) distribution experiments with dictator, ultimatum, trust, and other social dilemma games are allocating "manna from heaven" is so obviously problematic that one hardly needs to justify a further attempt at inducing game adequate role entitlement. Compared to earlier studies on the auctioning of roles, we avoid the selection bias of strategic auctions and a scenario in which only the most ambitious participants play the game. This way of providing entitlement should induce participants to exploit the advantages of their position. Thus, our way of inducing entitlement obviously improves the internal and external validity of experimental findings and, more generally, alleviates the problems of "labstraction" (Güth and Kliemt forthcoming). We have clearly observed strong entitlement, which we can also confirm as rather stable and thus robust to learning and experience.

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## Appendix

### Instructions

Welcome and thanks for participating in this experiment. You will receive 2.50 euros for having shown up on time. Please remain quiet and switch off your mobile phone. Please read the instructions — which are the same for everyone — carefully. You are not allowed to talk to other participants during the experiment. If you do not follow these rules, we will have to exclude you from the experiment and therefore from any payment. To make sure you have understood the instructions, you have to answer several control questions before you can begin with the experiment. You will receive 3 euros for correctly answering the control questions. If you answer a control question three times incorrectly, you will be excluded from the experiment. If you have a question, please raise your hand. An experimenter will then come to you and answer your question in private. The show-up fee of 2.50 euros, the 3 euros for answering the control questions, as well as any additional amount of money that you may earn during the experiment, will be paid out to you in cash

at the end of the experiment. The payments are made in private so that no other participant will know the amount of your payment. In the experiment, all amounts are denoted in ECU (experimental currency units). At the end of the experiment, the ECU earned will be converted into euros according to the following exchange rate:

$$1 \text{ ECU} = 2 \text{ euros}$$

Please note that it is also possible to incur losses in this experiment. In this case, you can choose whether you pay for the incurred losses out of your own pocket or compensate for them by fulfilling an additional task at the end of the experiment. In this task, you will be asked to search for certain letters in a text and to count them. By doing so, you can compensate a 1 euro loss per extra task. Please note that these additional tasks can only be used to counterbalance possible losses but not to increase your earnings.

### **Proceedings of the Experiment**

The experiment consists of a pre-phase, followed by twelve rounds with the identical course of action in every round. You will be paid for the pre-phase and two of the following twelve rounds. One of these two payoff relevant rounds is randomly drawn from the first six rounds, and the other from the second six rounds. In every round, two participants will interact with each other just once; afterwards, new pairs will be formed. Hence, it is very unlikely that you will encounter the same participant twice in the course of the experiment. Your identity will not be revealed to any other participant.

At the outset of the experiment, you will be assigned one of two possible roles: X or Y. You will be informed of your role following the pre-phase, i.e., at the beginning of the first round. You will keep your role through all twelve rounds of the experiment. However, whether you will be able to act in your role depends on luck as well as on how much you are willing to pay for the opportunity to act in your role.

#### **1. Part: Instructions for acquiring the role**

Following the pre-phase, i.e., at the beginning of the first round, half of the participants are randomly selected as candidates for role X and the other half as candidates for role Y. Thus, an X-candidate cannot acquire the role of Y, and vice versa.

At the outset of the first round, you will be told whether you are an X- or an Y-participant, and thus, which role you can acquire. You are then asked to name the maximal price  $b$  you are willing to pay to act in your designated role in this round. As your willingness to pay  $b$ , you can choose a number between 0 and 13 ECU (at most two decimal places):  $0 \leq b \leq 13$ .

Subsequently, we randomly draw the actual price  $r$  that you would have to pay to acquire the right to act in your designated role in the given round. The





For every amount of money  $p$ , you have to specify in advance whether you accept or reject it by clicking the corresponding button (i.e., you are required to take 11 decisions per round).

After all participants have made their choices, your earnings and the earnings of the other participant in your pair will be determined as follows: for the amount of money  $p$  actually proposed by the X-participant, the computer will check whether the respective Y-participant in the pair accepted this amount. If so, X will earn 6 ECU and Y will earn  $(p - 6)$  ECU. If Y rejected the amount of money chosen by X, then both X and Y will earn nothing.

The possible earnings that the two participants in the pair will receive are summarized in the table below:

		X earns in euro	Y earns in euro
X chooses $p = 7$	Y accepts	6	1
	Y rejects	0	0
X chooses $p = 8$	Y accepts	6	2
	Y rejects	0	0
X chooses $p = 9$	Y accepts	6	3
	Y rejects	0	0
X chooses $p = 10$	Y accepts	6	4
	Y rejects	0	0
X chooses $p = 11$	Y accepts	6	5
	Y rejects	0	0
X chooses $p = 12$	Y accepts	6	6
	Y rejects	0	0
X chooses $p = 13$	Y accepts	6	7
	Y rejects	0	0
X chooses $p = 14$	Y accepts	6	8
	Y rejects	0	0
X chooses $p = 15$	Y accepts	6	9
	Y rejects	0	0
X chooses $p = 16$	Y accepts	6	10
	Y rejects	0	0
X chooses $p = 17$	Y accepts	6	11
	Y rejects	0	0

### Two examples for the course of a round

**Example 1:** As a willingness to pay  $b$ , the X-participant in a pair names the amount of 4.91 ECU. The willingness to pay  $b$  of the Y-participant is 7.62 ECU. The randomly generated actual price  $r$  is 3.20 ECU for X and 4.33 ECU for Y. Since both participants offered more than the actual price, they acquire the right to act in their respective roles. In his role, X chooses the amount of

money  $p = 15$  ECU. Y accepts this amount. Accordingly, both participants receive a payoff from this interaction.

- X receives 6 ECU, from which the price  $r = 3.20$  ECU for the acquirement of his role is subtracted. Thus, X's payoff in this round amounts to 2.80 ECU.
- Y receives  $15 - 6 = 9$  ECU, from which the price  $r = 4.33$  ECU for the acquirement of the role is subtracted. Accordingly, Y's payoff amounts to 4.67 ECU.

**Example 2:** As a willingness to pay  $b$ , the X-participant in a pair names the amount of 7.80 ECU. The Y-participant's willingness to pay  $b$  is 5.01 ECU. The randomly generated actual price  $r$  is 6.20 ECU for X and 8.03 ECU for Y. In this case, X acquires the right to act in his role, but Y does not. For the following decisions, X is therefore matched with another Y-participant, who acquired his role at a price of 6 ECU. In his role, X chooses an amount of  $p = 13$  ECU. Y refuses this amount. Accordingly, both participants do not receive a payoff but need to pay the price for the acquirement of their role.

- X receives  $0 - 6.20 = - 6.20$  ECU
- Y receives  $0 - 6 = - 6$  ECU

### Your payoff

Your final payoff consists of:

- An amount of money for showing-up on time (2.50 EUR)
- + an amount of money for answering the control questions correctly (3 EUR)
- + earnings from the pre-phase
- + earnings from a round randomly drawn from rounds 1-6
- + earnings from a round randomly drawn round from rounds 7-12

Please remain quiet. If you have any questions, please raise your hand.