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Fairness in bargaining

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Abstract

We consider new three player games to test existing models of fairness. Our games consist of a proposer who offers an allocation of $10 between two players, either himself and the responder or the responder and a third party. In each case, the responder either accepts or rejects this allocation. In case of a rejection, the player who was not part of the initial division (the third party and the proposer, respectively) receives a rejection payoff (of $0, $5 or $10, depending on the game). Our results cast some doubt on existing fairness theories.

JEL classification: C91; C78

Keywords: Ultimatum game; Fairness; Bargaining

1. Introduction

There is considerable evidence that considerations of fairness affect economic behavior. Fairness is prominent in bilateral negotiations and has found its way into the economics literature via the numerous experiments on the ultimatum game (see Güth et al., 1982 and for an overview Roth, 1995). Moreover, theoretical and empirical work has shown that even

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in market settings fairness considerations can play an important role.[1] This abundance and importance of fairness behavior has been addressed by models of social preferences that assume that people do not care solely about their own material payoff.

It is possible to distinguish between two types of models of social preferences. The first type contains models in which people care about the distributions of payoffs, whereas in the second type people care about the intentions of other players and are motivated by reciprocity.

One class of prominent models of distributional concerns posits that people care about their own payoff and how it compares to other people's payoff. Specifically, people are "difference averse": they do not like their payoff to fall behind (and to a lesser extent not to be ahead too).[2] This implies that a player may reduce her payoff if this leads to a reduction in the other players' payoff and reduces payoff inequality, but she would never sacrifice to increase payoff inequality. Alternative models of distributional concerns contain preferences for maximizing social surplus and helping low-payoff players more than high-payoff players.[3]

According to reciprocity based models, people are motivated not only by their final outcomes, but also by the way the outcome has been achieved. A player cares about the intention that drives an action and may be willing to sacrifice material payoff to reciprocate, rewarding fair behavior and punishing unfair behavior (see Rabin, 1993; Dufwenberg and Kirchsteiger, in press; Falk and Fischbacher, 1999).

Models of payoff distribution recently gained much attention due to the pioneering work of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000). They successfully model simple preferences for distributional concerns that account for behavior in many experiments, even experiments that previously have been viewed as showing the importance of reciprocity concerns.[4]

In this paper, we first present a comprehensive definition of outcome-based preferences that subsequently allows us to test the explanatory power of outcome-based preferences versus preferences that include intentionality concerns.

2. Fairness models

Models of distributional preferences of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) assume that the utility $u_i(x)$ of an outcome $x = (x_1, \ldots, x_i, \ldots, x_n)$ for players of the game depends on player i's own payoff x_i and how x_i compares to the other players' payoffs x_j. Players' preferences therefore depend only on the outcomes of the game and not on the way they have been achieved. This feature makes it easy to apply such models and use them to make specific predictions about games.

[1] Kahneman et al. (1986); Fehr et al. (1993); Fehr et al. (1997).

[2] Ochs and Roth (1989); Loewenstein et al. (1989); Bolton (1991); Kirchsteiger (1994); Fehr et al. (1998); Fehr and Schmidt (1999); Bolton and Ockenfels (2000).

[3] Charness and Rabin (2002).

[4] The most striking example being the gift exchange game, for example Fehr et al. (1993).

Subsequently, there have been many attempts to show the importance of intentions and reciprocity concerns (i.e., the way outcomes have been achieved) by generating empirical results that distributional preferences cannot account for. A typical example is a study by Falk et al. (2003) on a mini ultimatum game. They show that the unequal offer of (8,2), where 8 is for the proposer and 2 for the responder, is much more likely to be rejected if the proposer could have proposed an equal offer (5,5) than if the proposer could have proposed only an even more unequal offer, such as (10,0). This finding suggests that the acceptability of an offer is influenced by the set of available offers and not just by the set of final outcomes the responder chooses from. In this example, the set the responder chooses from after an offer of 8:2 is in both cases 8:2 in case of acceptance and 0:0 in case of rejection. The authors interpret this finding as indicating that, depending on the available alternatives for the proposer, identical offers signal different intentions of the proposer and view this experiment as evidence for the importance of "intentions." Similarly, Nelson (2002) shows that limiting the maximum offer in a $20 ultimatum game to $4 increases the acceptance of $4, indicating that intentions matter.

There are, however, attempts to reconcile such evidence with models of distributional preferences. Bolton and Ockenfels (in press) present a variant of their original model in which they assume that the "reference point" of fair behavior is the equal split outcome only if this is a feasible outcome. In case an equal split is not possible, the outcome that is closest to the equal split serves as the reference point for the outcome that is perceived as fair. Therefore, in the experiment above by Falk et al. (2003), when the proposer has to decide between (8,2) and (10,0), the outcome (8,2) is the closest to the equal split and hence is perceived as fair and should be often accepted. However, when the proposer chooses between (8,2) and (5,5), the equal split is feasible and the outcome (8,2) becomes unfair and less acceptable. Thereby, Bolton and Ockenfels (in press) provide an explanation based solely on the distribution of outcomes without having to model the players' intentions.

The numerous attempts to show the limitations of distributional preferences emphasize the necessity for a clear definition of such models. In this paper, we give a precise definition of what we view as the most general possible outcome-based preferences. These shall retain the flavor of outcome based models in that, although the whole payoff space may be relevant for determining preferences over specific outcomes, the strategy choices that lead to these outcomes shall not be relevant for preferences.

Definition. Social preferences are purely distributional if the preferences of the agent solely depend on (x_i, x_{-i}, X) where $X = \{x{:}x$ are possible material payoff distributions of the *game*$\}$ and if for all permutations σ of $\{1, 2, \ldots, n\}$ such that $\sigma(i) = i$ we have $u_i(x, X) = u_i(\sigma(x), \sigma(X))$ where $\sigma(X) = \{\sigma(x){:}\ x \in X\}$.

Player i has distributional social preferences if she only cares about how much she receives and about the distribution of payoffs among other players. We allow for these preferences to depend on the set of possible payoff distributions.[5] However, the fact that player i's preferences have to be invariant to permutations among other players means

[5] A first step in this direction can be found in Bolton and Ockenfels (in press).

that player *i*'s preferences about player *j*'s payoff cannot depend on the actions taken by player *j*.

All distributional models presented in the literature so far are special cases of our general definition. This includes Fehr and Schmidt (1999), Bolton and Ockenfels (2000) and the first part of Charness and Rabin (2002). Furthermore, models of intentionality do not fulfil this definition, since their essence is that a player *i* treats player *j* depending on the actions of player *j*.

Studies on the limitations of outcome based models, such as Falk et al. (2003), based their conclusions on changes in behavior across two games, where the two games differ in the set of possible payoff distributions. This leaves two possible explanations for the change in behavior. One possibility is that players care about the whole set of possible payoff distributions and hence have slightly more general outcome-based preferences than the ones described in the original models. The other possibility is that players care about other players' actions and intentions.

Therefore, to test the limitations of distributional models, we consider pairs of games that leave the payoff distributions across games constant. This implies that changes in behavior across these games cannot be attributed to preferences over outcomes.

Models of intentionality assume that the way player *i* cares about the payoff of player *j* depends on *i*'s beliefs about player *j*'s "kindness" towards *i*. If player *j* is kind towards player *i*, then player *i* receives an increase in utility as player *j*'s payoffs increases (positive reciprocity). Analogously player *i* prefers to decrease player *j*'s payoffs when player *j* is unkind to player *i* (negative reciprocity). The models mainly differ in their definition of "kind" actions.

Pure reciprocity models have also been experimentally rejected. For example, in the context of sequential dilemma games, Bolton et al. (1998) found only secondary and insignificant evidence for reciprocity.

The experiment reported here consists of three pairs of games with complete information. Within each pair we keep the set of possible payoff distributions constant. We find differences in behavior in different conditions, although the distribution of payoffs remained constant. These experimental results cannot be explained by outcome-based preferences. Although some of our results can serve as evidence for the importance of intentions, others are not consistent with intentionality models either.

3. The experiment

In order to test whether the payoff distributions suffice to explain fairness considerations, we consider two different types of three player games. In each game, there is a proposer (P), a responder (R) and a third party (T). The proposer makes an offer to divide \$10 between two players, where offers have to give at least \$1 to each of the two players. In the first class of games (third-party rejection payoff games or TRP) the proposer offers to divide \$10 between herself and the responder. In case the responder accepts the offer, the division is implemented. In case the responder rejects, both she and the proposer receive nothing, and the third party receives a rejection payoff. Depending on the game, this rejection payoff is \$0, \$5 or \$10 (the whole pie). Note that if the rejection payoff is \$0, the game reduces to a regular ultimatum game between the proposer and the responder, with a third player who never receives any payoff, regardless of the actions taken. In case the rejection payoff is $10, the game also almost reduces to a regular ultimatum game between the proposer and the responder. The difference is that normally, in case of rejection, the pie goes back to the experimenter, whereas in this case it goes to a third party who is another subject in the experiment.

In the second class of games (proposer rejection payoff game or PRP) the proposer makes an offer to divide $10 between the responder and the third party. In case the responder accepts the offer, the division is implemented. In case the responder rejects, both she and the third party receive nothing, and the proposer receives a rejection payoff. Depending on the treatment, this rejection payoff is again $0, $5 or $10 (the whole pie).

4. Experimental design and procedures

Ninety participants were run in 4 sessions of 24, 18, 18 and 30 participants. At the beginning of the experiment participants were randomly assigned to one of the three roles, which they kept during the whole experiment. Participants played all six games (the two types of games with the three different amounts of rejection payoff each). Each game was played five times, and in each repetition a player was randomly matched to two other players to create groups that consisted of one proposer, one responder, and one third party. The games were played in two orders so that two sessions began with the TRP games and the two other sessions began with the PRP games. The experiment was computerized, using the Ztree software (Fischbacher, 1998). Within each class of games, participants played the three versions in the following order, starting with rejection payoff of $10, then $0, then $5. The proposer did not receive any feedback about the choice of the responder so that their decisions could not be influenced by responders during the game. Subjects received $10 show up fee and the outcome of three randomly selected games. The session lasted for about one and a half hours and participants earned on average $19.5.

5. Predictions and results

We first focus our attention on the behavior of the responder having received an offer of $10 - x$, where $x \in \{1, 2, \ldots, 9\}$. In games in which the third party receives the rejection payoff the share x is for the proposer whereas it is the share of the third party in the games where the proposer receives the rejection payoff.

5.1. Distributional models

For a given rejection payoff, theories in which the preferences of players depend only on the payoff distribution must make the same predictions for the PRP games and for the TRP games concerning the behavior of the responder.

For example, consider a rejection payoff of $10 along with the offer of $10 - x$ for the responder. The responder has to choose whether to accept or to reject the offer. As can be seen in Table 1, in both games the responder has to choose between the same two payoff

Table 1
Possible payoff distributions after a $10 - x$ proposal for the TRP-$10 and PRP-$10

	TRP		PRP	
	Accept	Reject	Accept	Reject
Proposer	x	0	0	10
Responder	$10 - x$	0	$10 - x$	0
Third party	0	10	x	0

distributions. Consider the TRP game where the third party receives the rejection payoff. If the responder accepts the offer, then the payoffs are (x,10 − x,0) for (proposer, responder, third party); if she rejects the offer, the payoffs are (0,0,10). In the PRP games where the proposer receives the rejection payoff, the responder decides between (0,10 − x,x) in case of acceptance and (10,0,0) in case of rejection.

Outcome based models of difference aversion such as of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) make further predictions depending on the size of the rejection payoff.

The utility function of Fehr and Schmidt involves a comparison of the subjects' own payoff x_i to the payoff of all the other subjects, where subjects have a stronger distaste for their payoff falling behind than being ahead. Specifically,

$$U_i(x) = x_i - \alpha_i \frac{1}{2} \sum_{j \neq i} \max\{x_j - x_i, 0\} - \beta_i \frac{1}{2} \sum_{j \neq i} \max\{x_i - x_j, 0\}$$

where $\beta_i \leq \alpha_i$, $0 \leq \beta_i \leq 1$ and α weighs the disadvantageous and β the advantageous inequality.

Bolton and Ockenfels (2000) have players who compare how their payoff relates to the average payoff: $U_i(x) = v_i\ (x_i, \sigma_i)$ where $\sigma_i \left(\sum x_j, x_i\right)$ equals$x_i / \sum x_j$ if $\sum x_j > 0$ and $1/n$ otherwise. They also assume that $v_i$is increasing and concave in x_i, $v_{i2} = 0$ $\sigma_i = 1/n$ and v_{i22} < 0.

Both models predict that for a rejection payoff of $10 (for both types of games) the responder should accept all proposals, the reason being that the difference between 0 and 10 is always larger than the difference between $10 - x$ and x. For a rejection payoff of $5, Bolton and Ockenfels (2000) predict no rejection since a share of 0 is less than $(10 - x)/10$, $1 < x < 9$.[6]

Fehr and Schmidt may account for some rejections as long as $x - (10 - x) > 5$ where $x - (10 - x)$ is the term that determines the disadvantageous utility in case of acceptance, which equals 5 in case of a rejection.[7]

Furthermore both models predict that the acceptance of "unfair" offers (e.g. offers where $(10 - x) \leq 3$) should increase as the rejection payoff increases (of course, independently whether the proposer or the third party receives the rejection payoff).

[6] If the responder receives a higher offer, $10 - x \geq 4$, the responder may reject out of a distaste for receiving a share higher than the equal split 1/3.

[7] Analogously to Bolton and Ockenfels (2000), the responder may reject offers that lead to a high advantageous inequality.

In the first part of their paper, Charness and Rabin present a model of outcome-based preferences where players always prefer a higher sum of material payoffs for all players and have an additional concern for helping the worst-off player. These "quasi-maximin" utility functions have the form, for three players, $U_i(x) = (1-\gamma)x_i + \gamma[\delta\ \min(x_1, x_2, x_3) + (1-\delta)(x_1 + x_2 + x_3)]$, where $\delta \in (0,1)$ measures the concern for helping the worst-off person versus maximizing the total social surplus and $\gamma \in [0,1]$ measures the extent to which player *i* pursues the social ideal versus his self interest. This model predicts that the higher the rejection payoff, the more likely a responder should reject a low offer. The reason is that in case of a rejection, the total social surplus increases as the rejection payoff increases.

Furthermore, one could think of a model in which the responder compares her payoff only to the proposer's payoff, the only other player who takes actions in these games (though such a theory would not qualify as purely outcome based). Such preferences predict the same outcomes for all the TRP games, independently of the rejection payoff. In the PRP games, the games where the proposer receives the rejection payoff, the responder should accept all offers, as long as the rejection payoff is \$10. For a rejection payoff of \$5 or \$0, in the PRP game, we expect the responder to accept all offers.[8]

5.2. Intentionality models

In models of pure intentionality player *i* only cares about player *j*'s payoff when player *j* has been "kind" (or "unkind") towards player *i*. For a specific model, we refer to Dufwenberg and Kirchsteiger which extends Rabin to extensive form games.

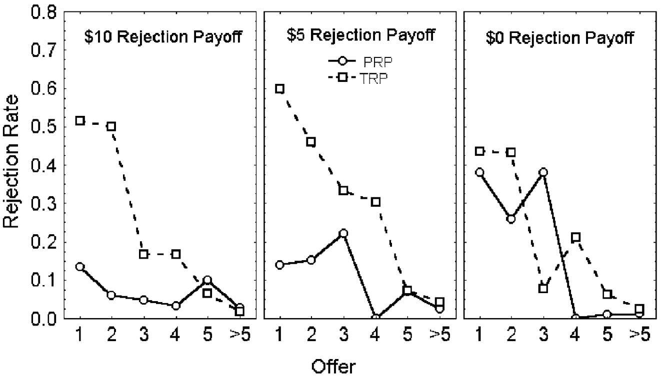
For all games in which the third party receives the rejection payoff (all TRP games), such a model predicts the same outcome, independent of the amount of the rejection payoff the third party may receive; since the third party has no action in the game, he/she can not show any "kindness" and therefore his/her payoff does not enter into the utility of the proposer nor to the utility of the responder.

In the PRP-\$0 game (i.e., the game where the proposer receives a rejection payoff of \$0), the responder has to accept all offers since the payoff of the proposer is \$0 independently of the responder's action (and the third party, not taking any action, does not signal any kindness).

In the PRP-\$10 and PRP-\$5 game, models of intention allow for equilibria where the proposer makes a low offer to the responder who accepts this offer so as not to "reward" the proposer with the "high" rejection payoff for his "unfair" proposal.

A more general model that involves concerns over intentions and outcomes can be found in Charness and Rabin. They suggest a simple, non-equilibrium version of quasi-maximin preferences. According to the model, a move by the proposer that results in a violation of quasi-maximin preferences leads to a reduction of the other player's concern for the proposer's material payoff. Such moves either reduce the sum of all players' payoffs or

[8] The responder could reject offers only out of a concern of advantageous inequality. In the case of \$5, this can only occur for high $10 - x$ (the responders' share); for a \$0 rejection payoff it can occur for all possible offers. Such participants would then reject more often, the higher their share.



PRP:	84	17	7	10	20	12	96	11	6	4	19	14	29	9	7	14	63	28
TRP:	33	16	16	24	42	19	34	29	16	22	41	8	26	27	13	22	48	14

Fig. 1. Mean rejection rates for each game PRP and TRP, where the proposer or the third party receives the rejection payoff, respectively; below find the number of observations for each offer for each game.

reduce the payoff of the least well off player. In our games the proposer has no such moves available; hence this version of reciprocity will not have any impact on our games.[9]

6. Results

We first focus on the behavior of the responder. Table A.1 in the Appendix A[10] shows the number of observations for each offer in each game.

6.1. *Responders' behavior*

Two main conclusions can be drawn from Fig. 1 (which we will test later on).

Result 1. The responder is more likely to reject low offers when the third party receives a rejection payoff, than when the proposer receives it.

Result 2. The responder is more likely to accept a low offer when the proposer receives a rejection payoff of $5 or $10 than when the proposer receives $0 payoff.

We first ran a random effects Probit regression for each value of the rejection payoff (Runs 1, 2 and 3 in Table 2)

$$\text{Reject} = f(a + b_{\text{offer}} * \text{offer} + b_{\text{third party}} * \text{third party} + b_{\text{order}} * \text{order})$$

[9] Charness and Rabin have a more complicated, six parameter equilibrium version of quasi-maximin behavior with reciprocity which they do not test with their experiments, and we shall follow this decision.

[10] Appendix is available on the journal's website.

Table 2
Random effects Probit regression for the \$10, \$5 and \$0 rejection payoffs and for the TRP and PRP games

Variables	Run 1: \$10 coeff. (*P*-value)	Run 2: \$5 coeff. (*P*-value)	Run 3: \$0 coeff. (*P*-value)	Run 4: TRP coeff. (*P*-value)	Run 5: PRP coeff. (*P*-value)
Constant	−1.17 (0.047)	−0.49 (0.28)	−0.16 (0.76)	0.66 (0.21)	−1.08 (0.01)
Offer	−0.5 (0.00)	−0.27 (0.00)	−0.43 (0.00)	−0.42 (0.00)	0.33 (0.00)
Third party	1.3 (0.00)	1.26 (0.00)	0.46 (0.05)	–	–
Order	0.35 (0.34)	−0.28 (0.35)	0.08 (0.82)	−0.3 (0.35)	0.6 (0.02)
\$5	–	–	–	0.49 (0.01)	−0.5 (0.04)
\$10	–	–	–	0.06 (0.76)	−0.58 (0.02)
Rho[a]	0.38 (0.00)	0.26 (0.00)	0.29 (0.001)	0.36 (0.00)	0.17 (0.006)
Observations	300	300	300	450	450

[a] Rho is the parameter for the individual random effect.

and then for each type of game (Runs 4 and 5 in Table 2)

$$\text{Reject} = f(a + b_{\text{offer}} * \text{offer} + b_5 * 5 + b_{10} * 10 + b_{\text{order}} * \text{order}).$$

Reject equals 1 if the offer is rejected and 0 if it is accepted. Offer $\epsilon\{1, 2, \ldots, 9\}$ is the amount offered to the responder. Third party equals 1 in case the third party receives the rejection payoff, and 0 if the proposer receives the rejection payoff. Order tests for order effects. It equals 1 if we started with the games where the third party receives the rejection payoff and 0 when we started with the games where the proposer receives the rejection payoff. The variable \$5 equals 1 if the rejection payoff is \$5 and 0 if the rejection payoff is \$0 or \$10 (and analogously for \$10).

The logistic regression for all rejection payoffs (Runs 1–3) reveals a significantly higher rejection rate in the TRP game (where the third party receives the rejection payoff) than in the PRP game (Result 1). This can not be reconciled with outcome based models that predict no difference in behavior according to the identity of the recipients of various payoffs.

Moreover, in the PRP game, the rejection rate was significantly lower for the \$10 and \$5 rejection payoff than for the \$0 rejection payoff (Result 2)[11]. This can not be explained in terms of pure intentionality models, according to which the responder should accept all offers in the PRP game with \$0 rejection payoff. It also refutes an alternative model in which the reference group of the responder consists only of the proposer. According to this model, the responder should have accepted every offer in the PRP game with \$0 rejection payoff.

The analyses also reveal that in the games, where the third party receives the rejection payoff (TRP games) the behavior of the responder when the rejection payoff is \$10 is not different from the behavior when the rejection payoff is \$0. However, the behavior when the rejection payoff is \$5 is significantly different from the behavior when the rejection payoff is \$0. Note that a rejection in the case of a \$0 rejection payoff leads to loss of total surplus for all players compared to the case of a \$5 or a \$10 rejection payoff. Therefore, preferences for

[11] A Random effects Probit regression in which we left out the \$5 revealed no significant difference between the \$10 and the \$5.

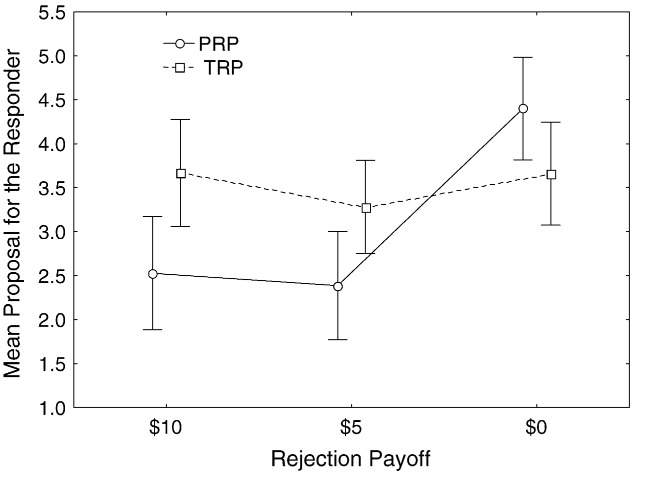


Fig. 2. Mean proposal and standard error for each value of the rejection payoff ($0, $5 and $10) and for each game.

maximizing total social surplus (Charness and Rabin) would predict differences in behavior. However, responders were not more likely to reject an unfair proposal in the $10 game than in the $5 or $0 games, eventhough the rejection rate was higher when the rejection payoff was $5 than when it was $10 or $0.[12] This result is not completely in line with Kagel and Wolfe (2001) who found no differences in the rejection rate as a function of the third party's payoff.[13]

Lastly, as expected, for each game the size of the offer has a significant effect on the rejection rate. The higher the amount offered to the responder, the less she rejected the offer.

6.2. Proposer behavior

Different theories of fairness predict different behaviors of the responder, and hence, also different behavior of the proposer, whether because the proposer adheres to these fairness theories or because he wants to maximize her expected payoff. Fig. 2 shows the average offer and the standard error for each game and for each value of the rejection payoff.

The offers in the games where the third party receives the rejection payoff are invariant to the amount of the rejection payoff. The proposer correctly anticipated that the responder

[12] A Random effects Probit regression in which we left out the $5 revealed a significant difference between the $10 and the $5 ($b = -0.43$, $P < 0.03$) and between the $0 and the $5 ($b = -0.49$, $P < 0.01$).

[13] They consider a game where the proposer divides 15 between himself and two other potential responders, where one will turn out to be decisive and the other a dummy. Both responders decide whether to accept the offer, in which case the division is implemented, or to reject it, in which case the other responder, the dummy, receives a rejection payoff. The size of the pie to be divided was 15; the rejection payoff took values of −12, 0, 1, 3 and 12.

would not accept lower offers with a higher probability simply because a third party might receive a high rejection payoff (i.e., as expected based on outcome based models[14]).

Furthermore, the proposer offered a significantly lower amount to the responder when the proposer would receive the rejection payoff of $5 or $10 than when the third party would receive the rejection payoff. Presumably the proposer tried to maximize the probability that the responder will reject the offer.[15]

7. Conclusions

To clarify the discussion about the nature of fairness, and in particular the importance of intentions versus solely distributional concerns, we propose a general definition of distributional preferences. This enables us to design new games for which both models with distributional concerns and models with intentionality motives provide testable predictions. The differences we found between the games where the third party receives the rejection payoff (TRP) and those where the proposer receives the rejection payoff (PRP) cannot be explained by models that are based on distributional concerns (Result 1). Moreover, models that are based on intentionality type preferences cannot explain the high rejection rate that was found in the PRP game with $0 rejection payoff (Result 2). Furthermore, we do not find any evidence for concerns of maximizing the payoffs of all players. Hence, none of the major fairness theories can explain all our experimental results. This suggests a further need for fairness models that combine both intentionality and distributional concerns.

However, the aim of this paper is not to discredit existing theories. Rather, we want to broaden the spectrum of games that have been analyzed in an attempt to clarify the discussion of whether certain behaviors are driven by reciprocity or distributional concerns.

We think that more research is needed in order to understand in which situations models of distributional concerns provide good predictions and in which situations models with reciprocity concerns are more suitable. This might provide a fruitful alternative to searching for "the true fairness model".

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[14] We ran a linear regression with a random effect for the PRP and for the TRP game separately. The dependent variable was the mean amount proposed, and the independent variables were the rejection payoffs ($0, $5, $10) and the order. For the TRP game the rejection payoffs and the order had no effect. For the PRP game we found that the offers were significantly higher in the $5 rejection payoff game than in the $0 rejection payoff game ($b = -2.01$, $P < 0.0001$). The same pattern was found for the $10 rejection payoff game ($b = -1.87$, $P < 0.0001$). No significant effect was found for the order. For the PRP game, we also ran a regression in which we compared the amount offered in the $5 rejection payoff game to the amount offered in the $10 rejection payoff game. No significant difference was found.

[15] However, the rejection rate was so low in the game in which the proposer receives the rejection payoff that these strategic considerations do not help the proposer.

Appendix A. Instructions

See Table A.1.

A.1. Sample instructions

Welcome to the Computer Lab for Experimental Research at the Harvard Business School. Thank you for agreeing to participate in this experimental investigation on individual decision making. We will now read the instructions together. After that you will get the opportunity to study the instructions at your own pace and to ask questions. Please do not touch your keyboard, before the experimenter starts the experiment.

In this experiment, there are three types of players: Player A, Player B and Player C. We will now determine your role, which you will keep during the whole experiment. Only you will know which role you are playing, you will not know the role of other people in this room. I have here a deck of cards, one for each of you. A third are labeled A, a third are labeled B and a third are labeled C. On the bottom of the cards you will see a number that is only relevant for us to connect your terminal to the computer program. I will now show you the cards, shuffle them, go around and I will give one to each of you. When you get an A, you will be Player A, when you get a B, you will be Player B and when you get a C you will be Player C. You will also get page two of the instructions.

Now we have determined your role, you are either Player A, Player B or Player C. You will remain in the same role during the whole experiment. No one else will know, either now or later, which role you have. Let us now turn to page two of the instructions.

You will play different games, and you will play each game for five rounds. At the beginning of each game you will all see the specific rules on your computer screen. Once you finished reading the rules, please click the OK button, so the experiment can continue. At the beginning of each round a Player A, a Player B and a Player C in the room will be randomly matched to each other. You will not know (either now or later) the identity of the other players. In each round, the three Players who are matched

Table A.1
The distribution in percentages (number of observations) of the different offers as a function of the different games; PRP: proposer receives the rejection payoff and TRP: third party receives the rejection payoff

Offer	Rejection payoff					
	$10		$5		$0	
	PRP	TRP	PRP	TRP	PRP	TRP
>5	8 (12)	12.67 (19)	9.33 (14)	5.33 (8)	18.67 (28)	9.33 (14)
5	13.33 (20)	28 (42)	12.67 (19)	27.33 (41)	42 (63)	32 (48)
4	6.67 (10)	16 (24)	2.67 (4)	14.67 (22)	9.33 (14)	14.67 (22)
3	4.67 (7)	10.67 (16)	4 (6)	10.67 (16)	4.67 (7)	8.67 (13)
2	11.33 (17)	10.67 (16)	7.33 (11)	19.33 (29)	6 (9)	18 (27)
1	56 (84)	22 (33)	64 (96)	22.67 (34)	19.33 (29)	17.33 (26)

to each other will have to divide $10 among themselves. In each game, Player A will propose a division of how to split the money. However, in each game there will be different rules that determine what proposals Player A can make. Player A has to confirm the proposal by clicking the OK button. Player B will observe the proposal of Player A. Then, Player B needs to decide whether to accept or reject the proposal of Player A. If Player B accepts the proposal, all the players get the amounts Player A allocated to them. If Player B rejects, then the final allocation is determined according to the rules of the specific game you play. Player B also has to confirm the choice by clicking on the OK button. Hence the final division of $10 depends on the choice of Player A and of Player B. Player A will not know the decision Player B made. Player C will not get any information, and has nothing to decide. Once Player B decided whether to accept or reject Player A's proposal, the round is over and the next round starts.

For example, these are the rules of the first game: Player A has to divide $10 between himself/herself and Player B. Player A can only choose whole numbers, and has to give Player B at least $1. Player B will see how much Player A proposes to give to him/her. If Player B accepts, then Players A and B get the amount Player A allocated to them and Player C will get $0. If Player B rejects the proposal of Player A, then Player A and Player B both get $0, and Player C gets $10.

Different games will have different rules. At the beginning of each game you will see the specific rules on your computer screen.

After having played all the different games for five rounds, you will be paid for three randomly selected rounds plus a $5 participation fee and $5 early arrival fee (if eligible).

A.2. Summary

You will play several games for five rounds each. At the beginning of each game you will see on your computer screen the specific instructions with the rules for this game. You will then play this game for five rounds. At the beginning of each round, you will be randomly matched to two other people in the room, such that in each group there is one Player A, one Player B and one Player C. In each game, it is always Player A who will make a proposal on how to divide $10. In each game, it is always Player B that will see Player A's proposal and then has to decide whether to accept or reject the proposal. If Player B accepts, all players get what Player A allocated to them. If Player B rejects, all players get an outcome that is determined by the rules of the specific game you are playing. In all games Player C does not need to make any decision at all. Then, a new round starts. This means you will be randomly matched to two other people in the room, such that etc.

Remember that whenever you have an OK button on your screen, in order for the experiment to continue, or to confirm the choices you made, you have to click the OK button.

Are there any questions? You can now go through the instructions at your own pace. Please sign the informed consent form in front of you. Do not touch the computer before the experimenter announced the beginning of the game.

Are there any questions? When you have questions during the game, raise your hand and we will come to you. Thank you. Please start now.

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