

# Why people reject advantageous offers— Non-monotonic strategies in ultimatum bargaining Evaluating a video experiment run in PR China

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## Abstract

Asking responders in ultimatum bargaining for only minimal acceptable offers, implicitly assumes strategies to be monotonic. This assumption seems at odds with actual behavior. We report on a group experiment where 53 percent of the responders state non-monotonic strategies. Content analysis of the video-taped discussions show that social concern, non-expectancy of high offers, emotional, ethical, and moral reasons, group-specific decision rules and aversion against unpleasant numbers are main motives for rejecting advantageous offers. A control experiment with individuals not being observed also displays non-monotonic strategies. Our findings speak to reconsidering assumptions on the parameter space in models of inequity aversion.

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## 1. Introduction

Experiments on the ultimatum game have shown remarkably stable deviations from purely selfish behavior. In the standard ultimatum game (Güth et al., 1982), a proposer can decide on how to split a given amount of money (the pie) between herself and a responder. The responder can either accept or reject the proposal. In case of acceptance, both receive the amounts as allocated; in case of rejection, both receive nothing.

Numerous symmetric ultimatum game experiments (UG in the following) with zero outside options have shown that individual proposers typically offer 30–50 percent of the pie, with the equal split often being the modal and median offer. Proposers who offer the responders less than 20 percent face rejection with high probability. These findings have been replicated across different subject populations, with different monetary stakes and different experimental procedures (Fehr and Gächter, 2000).

Apparently, responders perceive highly disadvantageous allocations as unfair. In this situation, being treated unfairly corresponds to low payoffs. The monetary and the motivational incentive are not at odds. Thus, rejecting a low offer becomes a likely action.

How do responders behave, however, if confronted with advantageous allocations (i.e. offers higher than 50 percent of the pie)? In this situation, being treated unfairly corresponds to high payoffs. Are unfair yet advantageous offers rejected as well although the monetary and the motivational incentive are in conflict?

In the present paper, we report on a remarkably high number of advantageous offer rejections in a UG video experiment we have been conducting in the People's Republic of China. Here, subjects were observed during decision making. Participants acted together in responder or proposer groups of three people, each being video taped while making their decision.<sup>4</sup> Our research agenda requires information on discussions of all potential offers. We therefore modified the standard sequential protocol by using a variant of the strategy method (Selten, 1967) where responders have to state acceptance or rejection for the full strategy space. The combination of the video and the strategy method provides the unique opportunity to learn from participants' spontaneous discussions about their reasons and motivations for rejecting advantageous offers.

Why is it important to analyze discussions on advantageous offer rejections? For one thing, there is growing experimental evidence on high offer rejections (Bahry and Wilson, 2006; Bellemare et al., 2005; Bolton et al., 2005; Cardenas, 2003; Güth et al., 2003; Henrich et al., 2001; Huck, 1999), yet the literature is far from giving a consistent explanation for such seemingly implausible behavior. Most of the available data allow indirect inferences only, based on observed decisions, participants' social characteristics, questionnaires, debriefings and conversations, or on analyzing participants' cultural environment. To the best of our knowledge, no data on high offer rejections is analyzed so far that allow an investigation of subjects' spontaneous articulations not being mediated by the researcher's personal interpretation.

Our study provides new insights in several respects. First, we found social concern to be the main motivation for refusing advantageous offers. This is in agreement with models of inequity aversion. An inequity averse responder suffers a loss in utility when he is worse off and when he is better off than the proposer (Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999). Second, other motives turn out to be important as well. Among these are beliefs about proposer behavior,

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<sup>4</sup> According to Loomes (1999), the use of audio or video records makes up one of the real challenges of experimental economics in the future. For a more elaborate discussion on this research method, see Hennig-Schmidt (1999).

in particular non-expectancy of high offers, but also emotional, ethical, and moral reasons, special decision rules employed in some groups and aversion against unpleasant numbers. Finally, the empirical findings on advantageous offer rejections might induce a reconsideration of the assumptions on the parameter space in the models of inequity aversion.

Last but not least, we assessed the robustness of our results as to advantageous offer rejections. To this end, we repeated the experiment with participants that decided individually and were not observed. We found individuals to show the same rejection behavior regarding high offers as groups do. For that reason, the assumption seems justified that motivations revealed during group discussions in the UG pertain to individuals as well.

The remainder of the paper is organized as follows. In Section 2, we state our research goals, give a detailed description of the video and strategy method and report the experimental design. Section 3 presents the results. In the final Section 4, we discuss our findings and conclude.

## **2. Research questions, experimental methods and experimental design**

### *2.1. Research questions*

Our main research goal is to identify reasons and motivations that might cause subjects to reject advantageous offers. We use content analysis as our research method. Two coders independently assigned segments of the video-taped discussions to categories constructed to capture potential motives for refusing high offers. The frequency of groups articulating a category at least once is taken as the measure of importance for the underlying motive.

Our research might prove important for model building. Subjects' discussions might not only corroborate existing models of social preferences but also reveal other important motives that are not captured yet. In addition, our empirical findings might lead to re-examining the assumptions that underlie models of inequity aversion.

Other issues we are interested in are the following. Are groups heterogeneous in terms of strategies, and if so how does this affect the motives for rejecting advantageous offers? Does rejection behavior with regard to high offers differ when the situation changes from a symmetric to an asymmetric setting? Do individuals behave like groups when rejecting high offers?

### *2.2. Experimental methods*

Our main approach for eliciting subjects' motivations on advantageous offer rejections is the video method. Three subjects play together as a group and have to take a consensus decision. As in the standard UG, proposers have to decide on dividing the pie, and responders have to decide on acceptance or rejection of the offer. Intra-group discussions are video taped; inter-group contacts are anonymous with the experimenter transmitting decisions. The video-taped discussions are transcribed word for word into text protocols by graduate students who have been particularly trained and instructed for this task. The transcripts are used for subsequent content analysis.<sup>5</sup> All transcripts have been translated into German allowing Chinese and German researchers to work simultaneously on the text protocols.

The video method changes the standard experimental procedure in two respects. For one thing, individuals are substituted by groups. Second, groups are video taped. Both modifications may

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<sup>5</sup> Other studies employing verbal data to explain quantitative results are Charness and Dufwenberg (2006), Cooper and Kagel (2005) and Bewley (1999).

Table 1  
Experimental treatments

Treatment abbreviation	Treatment characterization	Outside option		Number of independent observations	Number of	
		Proposer	Responder		Proposer groups	Responder groups
T1	Symmetric	0	0	12	12	12
T2	Asymmetric	8	0	12	12	12
T3	Asymmetric	8	2	12	12	12

have an impact on behavior.<sup>6</sup> Our focus, however, is on understanding motives. Eliciting motives involves a tradeoff. On the one hand, directing subjects' attention to the research interest by, for instance, questionnaires or scales may influence their behavior. On the other hand, decisions might be affected as well if we avoid the attention impact and build a natural environment for spontaneous discussions in a group setting. We chose the latter approach and controlled for group behavior and observation by repeating the UG experiment with individual decision makers who were not observed.

Another feature of our experiment is the application of the strategy method. Our design differs from Buchan et al. (2004) and Knez and Camerer (1995) in that we elicit the full strategy space and not only minimal acceptable offers (MAOs). Asking for MAOs implicitly assumes that responders state monotonic strategies. Non-monotonic strategies cannot be revealed by this elicitation method.

The literature on how the strategy method affects behavior is inconclusive. No differences in behavior are found by Cason and Mui (1998) in a dictator game, by Brandts and Charness (2000) in a prisoner's dilemma and a chicken game, and by Oxoby and McLeish (2004) in an ultimatum game. Brosig et al. (2006) find no behavioral divergence when investigating groups as decision makers in a gift exchange game. Güth et al. (2001) do find differences in binary-offer ultimatum game experiments. Effects of replacing the equal split by a nearly equal-split option disappear if the strategy method is used. Brosig et al. (2003), in a bargaining game with high and low-cost punishment, find second-movers to punish more often in the sequential version of the low-cost game.

### 2.3. Experimental design and procedures

Our experiment is based on a one-shot UG, with groups (of three participants) as players. A proposer P has to decide about the division of a given pie of 20 tokens that she can allocate between herself and the responder R. P decides on the amount  $x \in \{0, 1, \dots, 20\}$  to be sent to R. Simultaneously and independently, R states acceptance or rejection for any possible offer. In case of acceptance of  $x$ , P receives the payoff  $20 - x$ , and R gets  $x$ . In case of rejection, both receive nothing (treatment T1). In two additional treatments, P is guaranteed a positive outside option of 8 in case of rejection whereas R's outside option is 0 or 2, respectively (T2 or T3). Table 1 summarizes the parameters of the three treatments.

<sup>6</sup> It is not clear that both modifications indeed induce an effect. There is inconclusive evidence on whether groups behave differently from individuals. Moreover, the available evidence in the literature suggests that observation does not systematically affect behavior. See Bosman et al. (2006) for a detailed discussion of these two issues.

The sub-game perfect equilibrium in T1 is  $x = 0$  if money is infinitely divisible. P will keep the whole endowment that R will accept. With a smallest money unit of 1 token a second sub-game perfect equilibrium exists, namely  $x = 1$ . P will send an amount equal to the smallest money unit which R will accept since he is better off than when rejecting. With a similar argument, the second sub-game perfect equilibrium in T2 (T3) is  $x = 1$  ( $x = 3$ ).

Our video experiment was run at Sichuan University, Chengdu, PR China, in July 2001 and August 2002. In total, 208 students, almost all undergraduate students majoring in natural sciences, economics and humanities, participated in 12 experimental sessions of each treatment, each session providing one independent observation. Subjects were recruited by campus advertisements promising monetary reward for participation in a video decision-making task. Registration assigned the subjects playing together in a proposer group to one room separated from that of the responder group. This procedure guaranteed full anonymity between groups interacting in a session. Due to no show-ups, 8 of the 72 groups consisted of only 2 people. Groups were randomly assigned to be proposers or responders.

All experimental sessions began with an introductory talk. The Chinese instructions were read in both the proposer and the responder group by one native experimenter each. Subjects then were encouraged to ask questions. All participants were fully informed on all features of the experimental design and the procedures. See [Appendix B in Supplementary data](#) for a translation of the Chinese instructions.<sup>7</sup>

Each proposer group had 15 min to decide on its proposal  $x$  and each responder group had 15 min to decide on acceptance or rejection of any possible offer. All discussions were video taped. The decisions had to be taken jointly by the respective group members and then had to be filled in on the corresponding forms.<sup>8</sup> All group members had to agree by signing the forms. When decision time was over, the experimenters matched proposal and acceptance or rejection and informed the groups about the result. There was no face-to-face contact between proposer and responder groups. Finally, participants were paid out in their groups and dismissed.

Sessions lasted for about 35 min. The monetary reward was calculated to equal the hourly wage in a typical students' job of about 35–45 RMB (Chinese Yuan). For each token retained by his/her group, each group member was paid 2 RMB. In addition, a show-up fee of 10 RMB was paid independent of the subject's earning in the experiment. On an average, subjects earned 27.82 RMB (3.72 Euro) including the show-up fee. The amounts paid were at the upper range of the wage distribution for Chinese students.

### 3. Results

#### 3.1. Choices

Results in the standard treatment T1 are in line with individual non-observation UG experiments discussed in the introduction.

Proposers' mean offer is 41 percent of the pie, and responders on average reject offers lower than 20 percent ([Table 2](#)). These numbers are far above the standard game theoretic predictions

<sup>7</sup> Instructions were translated into Chinese by one of the authors, Chaoliang Yang, who is a Chinese native speaker and both linguistically and culturally fluent in German. In addition, the back translation method was used.

<sup>8</sup> Decision forms are available on Hennig-Schmidt's webpage at [http://www.bonneconlab.uni-bonn.de/econlab/files/Hennig\\_Schmidt\\_Non\\_Monotone\\_Quotations\\_Decisions.pdf](http://www.bonneconlab.uni-bonn.de/econlab/files/Hennig_Schmidt_Non_Monotone_Quotations_Decisions.pdf).

Table 2  
Offers, lowest acceptance levels (percent of pie) and rejections of advantageous offers

Treatment	Average offer <sup>a</sup> (S.D.)	Average lowest acceptance level <sup>a</sup> , LAL (S.D.)	Rejections of advantageous offers <sup>b</sup>
T1	41.2 (9.1)	20.4 (12.1)	7 (0.583)
T2	33.7 (8.6)	12.5 (13.4)	7 (0.583)
T3	32.1 (6.6) [22.1 (6.6)]	21.6 (12.7) [11.6 (12.7)]	5 (0.417)
All treatments	35.7 (8.9) [32.4 (11.2)]	18.2 (13.0) [14.9 (13.0)]	19 (0.528)

<sup>a</sup> Numbers in parentheses account for responders' positive outside option in T3.

<sup>b</sup> Absolute (relative) frequency.

stated in Section 2. In T2 and T3, average offers and average lowest acceptance levels (LAL, in the following) are higher than predicted, too.

### 3.2. Classification of strategies

Fig. A1 in Appendix A in Supplementary data shows responder groups' strategies and proposer groups' offers. Two kinds of strategies can clearly be distinguished with regard to monotonicity of rejection behavior. We call a strategy *monotonic as to rejection* if all offers lower than any rejected offer are rejected as well. In *non-monotonic* strategies, the above definition does not hold. We use non-monotonicity of a strategy synonymously with rejecting one or more advantageous offers. *Systematic* non-monotonic strategies show a clear pattern. They either entail one rejection threshold involving acceptance of all offers lower than this limit, or they comprise two rejection thresholds, all offers below the lower and above the higher acceptance level being rejected. *Unsystematic* non-monotonic strategies do not exhibit a clear rejection pattern.<sup>9</sup>

Table 2 shows that 19 of the 36 responder groups (52.8 percent) chose non-monotonic strategies. Twelve of these are systematic and seven are unsystematic (see Fig. A1 in Appendix A in Supplementary data). We find this a surprisingly high number of high-offer rejections.<sup>10</sup> Note, however, that non-monotonicity of strategies can be revealed only if subjects have to state the full strategy space.

### 3.3. Analysis of verbal data

#### 3.3.1. Categories

We use content analysis as the method to analyze the transcripts. Content analysis is “a technique used to extract the desired information from a body of material (usually verbal) by systematically and objectively identifying specified characteristics of the material” (Smith, 2000, p. 314). The information that interests us is the reasons and motivations of subjects' rejecting advantageous offers. We extract this information by coding the verbal protocols. Coding denotes the process of assigning text segments to categories being designed to capture potential motives for refusing high offers.

<sup>9</sup> Bellemare et al. (2005) and Huck (1999) use slightly different classifications of the strategies.

<sup>10</sup> This is not to say, however, that most Chinese are expected to state non-monotonic strategies. The null hypothesis that the sample is drawn from a population choosing both types of strategies with equal probability cannot be rejected (binomial test, exact,  $p = 0.868$ , two-tailed).

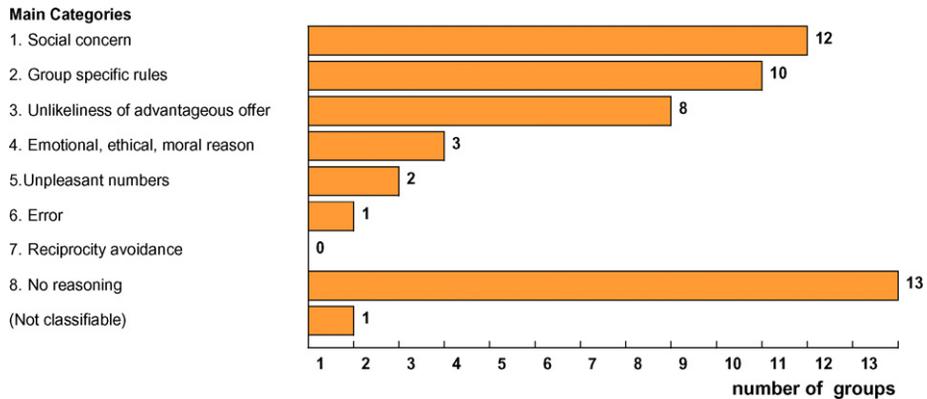


Fig. 1. Importance of main categories, non-monotonic groups.

Creating the categories was based on the following considerations. First, categories account for hypotheses stated in the literature: Concern for others is incorporated into models of social preferences (see Fehr and Schmidt, 2003 for an overview). Concern for others also matches the obligation for social attention essential to the Confucian background of our experimental subjects (Chinese Culture Connection, 1987). Moreover, we account for categories matching other features of our participants' cultural environment such as, for instance, shame avoidance, face damage and other ethical and moral norms. Subjects might reject advantageous offers also on emotional grounds or because of ethical reasons other than bilateral views of social concern (Bond, 1996). Another line of reasoning is that high offers are rejected because responders do not expect proposers to make advantageous offers (Huck, 1999) thus bearing no costs when turning them down. Henrich et al. (2001) attribute the refusal of generous offers to the culture of status-seeking through gift-giving. Accepting gifts, even unsolicited ones, implies strong obligations to reciprocate at some point in the future, possibly not to the responder's liking. Therefore, excessively large offers are frequently refused.

Second, we base categories on characteristics of the discussions. Some participants use specific rules to decide on acceptance or rejection, as, for instance, random choices. Others reject offers when unpleasant numbers are involved. One group made a mistake when stating rejection of an advantageous offer. In many cases, subjects asserted refusal without reasoning.

The main categories of our classification system are displayed in Fig. 1. See Table A1 in Appendix A in Supplementary data for the categories constituting a main category.

### 3.3.2. Inter-coder reliability

Three undergraduate native raters were extensively trained to do the coding. They screened the Chinese transcripts for discussions of advantageous offer rejections. One hundred and nine occurrences were found that we call the pool of discussed advantageous offer rejections. Two coders then independently classified the discussions according to our classification system. The coders were provided with a detailed coding manual. Coding was made very restrictive in order to rule out raters' own interpretations as far as possible. Only when rejection of an advantageous offer and the category characteristic were explicitly mentioned during a discussion was this text segment assigned to a category.

Data are reliable only if inter-coder agreement on category assignments is high. A generally accepted measure for inter-coder reliability is Cohen's Kappa  $K$ , which accounts for the agreement

that would result if coders merely make random assignments (Siegel and Castellan, 1988).<sup>11</sup>  $K$  can take values between +1.00 (complete agreement above chance) and –1.00 (complete disagreement). Zero means no agreement above chance.  $K \geq 0.80$  indicates satisfactory inter-rater reliability (Merten, 1995; Smith, 2000). For exploratory studies, slightly lower values are acceptable (Krippendorff, 1980). We, therefore, take  $K \geq 0.70$  as a satisfactory reliability standard.

For the vast majority of our categories,  $K \geq 0.70$  or slightly below (see Table A1 in Appendix A in Supplementary data). Unsatisfactory agreement levels are found in four categories only, resulting from infrequent coding. We conclude that on average our classification system yields satisfactory data.

Finally, coder disagreement has to be resolved to base the analysis on as much data as possible. We followed a procedure suggested by Bartholomew et al. (2000). If two coders disagree on a categorical assignment, a third rater is added, and the classification agreed upon by two of the three raters becomes the final rating. With this procedure, 13 out of the 19 disagreements could be resolved.

### 3.3.3. Data analysis

The motivations for rejecting advantageous offers correspond to the categories of our classification system. Our analysis is based on the main categories 1–8 in Fig. 1. We measure the importance of a main category by the number of groups that articulate this main category at least once.<sup>12</sup> Our measure of importance also allows us to resolve the remaining inter-rater disagreements up to category 4a “shame avoidance” (see Table A1 in Appendix A in Supplementary data). All other categories have been agreed upon by at least two coders for every non-monotonic responder group. Category 4a is referred to as “not classifiable” in the following. Note that groups articulate up to five different motivations.

In the following, the main categories are discussed according to their importance.<sup>13</sup>

**3.3.3.1. Social concern.** The most important main category is social concern, being discussed by 12 of the 19 non-monotonic groups. It is designed to capture the basic idea of social preferences including further aspects of subjects’ caring about others in addition to aversion against advantageous inequality. These are mutually unacceptable allocations, injuring bilateral fairness, allocations to the disadvantage of either player are unlikely, rejecting all but middle (balanced) allocations and extensive responder’s profit.

**3.3.3.2. Group-specific rules.** The second most frequently articulated main category concerns group-specific rules, being discussed by 10 of the 19 non-monotonic groups. It comprises reinterpretation of the experimental rules, going for risk, group specific systems or methods for

<sup>11</sup>  $K$  is the ratio of the proportion of times the coders agree,  $P(A)$  (corrected for chance agreement  $P(E)$ ), to the maximum proportion of times they could have agreed (corrected for chance agreement), thus  $K = [P(A) - P(E)] / [1 - P(E)]$ .

<sup>12</sup> We do not use the overall frequency of a main category as a measure of importance because it does not necessarily tell something about its importance as the following example illustrates. If the members of a responder group disagree on accepting an offer, group members will discuss this proposal rather frequently until they come to an agreement. If the group agrees on the same offer right away, they will talk about this allocation much less often. Note the high correlation between frequency of coding in a main category and the number of groups discussing this main category at least once (Spearman’s rho: 0.976).

<sup>13</sup> Quotations from the transcripts are available on Hennig-Schmidt’s webpage at [http://www.bonneconlab.uni-bonn.de/econlab/files/Hennig\\_Schmidt\\_Non\\_Monotone\\_Quotations\\_Decisions.pdf](http://www.bonneconlab.uni-bonn.de/econlab/files/Hennig_Schmidt_Non_Monotone_Quotations_Decisions.pdf).

acceptance or rejection such as, for instance, the game ‘rock, paper, scissors’, point matching of advantageous offer and accepted allocation. Finally, some groups apparently have difficulties in applying the experimental rules properly.

*3.3.3.3. Unlikelihood of high offer.* This main category captures beliefs about proposer behavior, in particular non-expectancy of advantageous offers. It is the third most frequently coded main category that eight of the non-monotonic groups discuss.

*3.3.3.4. Emotional, ethical, moral reasons is coded in three of the non-monotonic groups.* This main category refers to the Confucian background of our subjects and comprises face damage, refusal due to other emotional, ethical, moral reasons and to particular Chinese ways of thinking and norms. Shame avoidance was not classifiable.

*3.3.3.5. Unpleasant numbers is coded in two of the non-monotonic groups.* Numbers like 4, 14 (same pronunciation as death) and 13 are perceived as unlucky by our Chinese subjects. Some participants have an aversion against odd numbers (奇数) as well as against “non-round” numbers (非整数) because they are not divisible by 10 without remainder. Subjects dislike allocations involving these numbers even though accepting would have provided them with a higher payoff.

*3.3.3.6. Error (mistakenly stating rejection).* The text analysis revealed that one group (2.06) wanted to reject the extremely unfair allocation 0/20 rather than the advantageous allocation 20/0 which they mistakenly refused in the decision sheet.

*3.3.3.7. Reciprocity avoidance captures arguments in favor of status-seeking through gift-giving.* Subjects may reject advantageous offers even in a one-shot experiment with anonymous interaction because they experience the experimental setting like a familiar real-life situation where they would have to reciprocate a large gift. We expected to find comparable arguments during the group discussions because in the Chinese society, large gifts do create strong obligations to give in return at a later date. We, however, did not find any such argument, but we did find arguments showing that subjects feel uncomfortable about advantageous offers because they may involve a trick or a ploy.

*3.3.3.8. No reasoning.* Despite the fact that 13 of the non-monotonic groups are coded for this category, no reasoning is not the most important one. Subjects used to discuss acceptance or rejection according to the ascending order of allocations on the decision sheet. They, in general, do not repeat their arguments later on, but just state rejection. Therefore, if tracing another category was not possible, text segments were assigned to this main category.

#### *3.4. Analysis of non-monotonic strategies and treatments*

We now investigate whether certain main categories/motivations are indicators for unsystematic behavior. We omit group 2.06 because participants made a mistake when rejecting an advantageous offer.

Advantageous offer rejections have been argued to indicate that groups do not understand the game. This line of reasoning does not hold in general because our analysis showed that groups state reasonable motivations for rejecting high offers. Groups, however, who use or interpret the rules in a specific way tend to create unsystematic behavior (Fisher exact test,  $p=0.05$ ). Apparently,

unsystematic groups either do not understand the rules of the game or they intentionally use their own rules, being aware that they might lose money. Moreover, groups who score for emotional, ethical, moral reasons also score for unpleasant numbers (Fisher exact test,  $p = 0.02$ ).

Next, we analyze whether asymmetry influences strategy types. However, we do not find any significant treatment effect as to monotonicity (Fisher exact test,  $p > 0.30$ ).

Finally, we investigate possible treatment effects with regard to the importance of main categories. We again do not find significant differences between treatments. Yet, social concern scores twice as high in T1 (6 of 7, i.e. 86 percent of the groups) as in T2 (3 of 7, i.e. 43 percent) and T3 (2 of 5, i.e. 40 percent). This finding seems to indicate that social concern plays a minor role in the asymmetric settings.

#### **4. Discussion and conclusion**

Our study showed that rejecting advantageous offers is quite common in Chinese responder groups. It has been argued that advantageous offers in our video setting are rejected because subjects play in groups, are observed and do not want to appear greedy by accepting the larger part of the pie. There are two major objections against this critique. First, the observation effect can be ruled out if experimental subjects decide individually, are not observed and still reject advantageous offers. Second, if monotonic responder groups as well as proposer groups discuss non-monotonic strategies, this seems a strong indicator for non-monotonic strategies to be a common behavioral pattern in our subject pool.

To exclude the observation effect, we run a repetition of the present experiment but not in a group setting (Geng et al., 2006). Chinese individuals decided independently and anonymously. Eleven of the 90 proposers offered amounts higher than the equal split. Thirty-eight out of 89 responders<sup>14</sup> rejected advantageous offers. The hypothesis that individuals do reject high offers as often as groups do cannot be rejected (Fisher exact test,  $p = 0.204$ , one-tailed). Similar rejection behavior was shown by Chinese researchers in two classroom experiments. These studies show that non-monotonic strategies are a robust behavioral pattern of Chinese individuals.

As to the second objection, 17 proposer groups and 10 of the 17 monotonic responder groups discussed rejections of advantageous offers. Social concern and unlikeliness of high offer are the most important main categories. Overall, 29 responders, monotonic and non-monotonic groups, and 17 senders argue about refusing high offers (i.e. 64 percent of all 72 groups participating in the experiment). We conclude that rejecting advantageous offers is a phenomenon taken into account by a majority of participants in our experiment and thus cannot be dismissed as anomalous or irregular.

We found social concern to be the main motivation for non-monotonic strategies. In that respect, models of social preference, in particular models of inequity aversion, capture an important behavioral aspect in ultimatum bargaining. On the other hand, advantageous offer rejections cannot be handled by these models due to restrictions on the parameter space. The ERC model by Bolton and Ockenfels does allow for declining advantageous offers but assumes a rejection threshold not higher than the equal split. In the Fehr/Schmidt model, the specification of the model parameters rules out rejections of advantageous offers. The empirical findings on high offer rejections in the present paper and in the studies mentioned in the introduction speak to a reconsideration of the assumptions on rejection behavior.

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<sup>14</sup> Due to one responder not showing up, one of the responders was matched with two proposers.

Most experimental studies that report rejections of advantageous offers use the strategy method. It could be argued that subjects reject in hypothetical situations but would rather accept when confronted with actual advantageous offers. Some studies, nonetheless, document rejections of high offers also in hot situations (Bornstein and Yaniv, 1998; Henrich et al., 2001; Roth et al., 1991). This phenomenon needs to be investigated more systematically. Creating an adequate experimental environment is a task for future research.

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## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.jebo.2005.10.003](https://doi.org/10.1016/j.jebo.2005.10.003).

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