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Heiko Rauhut
Fabian Winter

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Friedrich Schiller University Jena
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www.uni-jena.de

Max Planck Institute of Economics
Kahlaische Str. 10
D-07745 Jena
www.econ.mpg.de

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A sociological perspective on measuring social norms by means of strategy method experiments*

Heiko Rauhut[1,§] and Fabian Winter[2]

[1] ETH Zurich, Swiss Federal Institute of Technology

UNO C15, Universitätstraße 41, 8092 Zurich, Switzerland

[2] Max Planck Institute of Economics

Kahlaische Straße 10, 07745 Jena, Germany

[§]To whom correspondence should be addressed:

rauhut@gess.ethz.ch, phone +41 44 632 0954, fax +41 44 632 1294

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Abstract

The measurement of social norms plays a pivotal role in many social sciences. While economists predominantly conduct experiments, sociologists rather employ (factorial) surveys. Both methods, however, suffer from distinct weaknesses. Experiments, on the one hand, often fall short in the measurement of more complex elements, such as the conditionality or the level of consensus of social norms. Surveys, on the other, lack the ability to measure actual behavior. This paper argues that the so-called "strategy

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method" compensates for these weaknesses by combining the observational characteristic of experiments with the conditionality of factorial surveys. We can demonstrate the applicability of the strategy method for the measurement of conditional bargaining norms in the case of ultimatum games. To substantiate our claim, we conduct a methodological experiment in which we compare results for the strategy ultimatum game with those from a "conventional" ultimatum game. The strategy method yields higher levels of normative compliance in terms of rejecting "unfair" offers. We conclude that the strategy method rather measures normative expectations whereas the "conventional" ultimatum game the willingness to sacrifice own profits to adhere to these expectations. Our results are consistent with previous comparative research between factorial surveys and observational data.

Keywords: Social norms, measurement, ultimatum game, strategy method, factorial surveys

JEL classification: Z13, D63, C91

The understanding of social norms is crucial for all disciplines in the social sciences. The content, dynamics and effects of norms have been on the sociological agenda since the beginning of the discipline (Durkheim, 1897/1997; Parsons, 1937). The emphasis on social norms cumulated in the *homo sociologicus*, who is a pure marionette of normative and role expectations (Dahrendorf, 1958). This notion has quickly been criticized as "oversocialized" (Wrong, 1961). In contrast, economists have been working for a long time on the other side of the road: Their conception of man as a *homo oeconomicus* considers a purely forward looking egoistic maximizer, who can consequently be described as "undersocialized". Only within the past decades, there has been fundamental research on the integration of both concepts.

The theoretical progress in both disciplines is therefore dependent on an accurate measurement of normative behavior. However, the methods for measuring social norms have taken separate pathes in economics and sociology. In economics, behavioral experiments have been attracting increasing attention. Besides the "core topics" of economic research, e.g. auctions (Cox et al., 1982) or price bubbles (Smith et al., 1988), also issues closer related to neighboring fields have been in-

vestigated, such as risk attitudes (Kahneman and Tversky, 1979) or problems of collective action (Ostrom et al., 1992). Later, Fehr and Gächter (2002) could demonstrate the relevance of social norms by illustrating the human's motivation for 'altruistic' punishment in collective good situations. This evidence paved the way to analyze the heterogeneity of societies with regard to the coexistence of *homo oeconomicus* and *homo sociologicus* (Gintis et al., 2001; Fehr and Gächter, 2002; Herrmann et al., 2008). By now, behavioral experiments have become the leading tool for the empirical measurement of social norms in economics.

In sociology, the economists' experimental toolbox has long been neglected for the understanding of social norms. This is surprising, given the promising results from economics and the fact that experiments have a "sociological" tradition (for reviews see Bonacich and Light, 1978; Cook and Hegtvedt, 1983; Kollock, 1998; Diekmann, 2008). The undervaluation of the experimental method is even more surprising considering the potential to rigorously test "social mechanisms" (Hedström and Swedberg, 1996), and the high internal, construct and statistical conclusion validity (Shadish et al., 2002). Furthermore, the sociological insights achieved by behavioral experiments are quite remarkable.[1] Instead of lab experiments, sociological research rather relies on factorial surveys when it comes to experimental techniques (see Wallander, 2009, for a recent review). Factorial surveys have been established as an experimental measurement of social norms (Jasso and Rossi, 1977; Jasso and Opp, 1997).

We argue that different conceptions of and research interests in social norms explain the focus on experiments in economics and on factorial surveys in sociology. In this article, we will demonstrate how the relatively undervalued experimental measurement called *strategy method* (Selten, 1967) can overcome the relative weaknesses of both methods. It combines the investigation of many (often counterfactual) conditions with incentivized experiments. We will apply it to the ultimatum game and demonstrate how the sociological concepts of *conditionality* and *consensus* of social norms can be experimentally measured with the strategy method. By means of this, we will extend the related studies in the field of economics (Fischbacher et al., 2001; Herrmann and Thoeni, 2009; Oxoby and McLeish, 2004) to sociological research questions regarding the conditionality of

[1] Scholars studied the effect of power (Cook and Emerson, 1978) or reputation in social networks (Raub and Weesie, 1990), the effect of trust in business relations (Buskens and Weesie, 2000), or the behavioral strength of reciprocity (Diekmann, 2004).

distributive justice norms with respect to individual effort and to the question as to whether the importance of effort receives normative consensus.

In what follows, we will present empirical evidence that the strategy method is better capable of discriminating between different social norms than "usual" experiments, just as factorial surveys are better suited than usual surveys to measure the complexity of norms. As a robustness test, we conducted a methodological experiment by comparing normative behavior in ultimatum games in a strategy method condition with one in an "ordinary" condition. The findings can be interpreted in line with previous comparisons between factorial surveys and observational studies. Finally, the results will be discussed with aiming at more efforts in interdisciplinary research.

1 Towards methodological integration of economics and sociology

The different measurement of social norms in economics and sociology may be due to different research interests and as well to different jargons in the different disciplines. If, for instance, the meaning of the term "social norm" differed across academic fields, it would be no surprise that the measures of norms were different as well. Many quantitative social scientists might agree to the (economists') definition of a social norm as

> "1) a behavioral regularity; that is 2) based on a socially shared belief of how one ought to behave; which triggers 3) the enforcement of the prescribed behavior by informal social sanctions." (Fehr and Gächter, 2000, p.166)

Defined in this way, specific social norms can be measured in the laboratory with the so-called *ultimatum game* experiment (Güth et al., 1982). This game can be regarded as a parsimonious measure for distributive justice and fairness norms. One proposer and one responder bargain over a given amount of money, called the *cake*. The proposer offers a share of the cake to the responder. If the responder accepts the offer, she receives the share and the proposer can keep the rest of the cake. If the responder rejects the offer, the cake is lost and nobody receives anything (for illustration see figure 1).

Empirical results indicate that the ultimatum game meets the three criteria of social norms stated above. Responders have normative expectations about the proposer's behavior so that low offers are frequently rejected, which can be regarded as informal sanctioning of norm violations. Proposers anticipate such potential punishment and form respective beliefs. These beliefs trigger behavioral regularities, such that offers below 20 percent of the cake are rare and close-to-equal splits are the most frequent outcome (Roth, 1995). This matches the definition of social norms given above that the behavior is 1) a regularity, it is 2) based on socially shared beliefs, and 3) it is sanctioned in case of violations. In the meanwhile, ultimatum game experiments have become one of the most prominent laboratory measures for social norms and even been applied in anthropology for measuring cultural differences in normative behavior and punishment of norm violations (Henrich et al., 2001, 2004).

Such experiments, however, have a major shortcoming with respect to sociological research questions; social norms are rarely a yes/no decision. A long history of sociological research emphasizes (at least) four additional aspects of norms:

> "1) polarity, whether a norm is prescriptive, proscriptive, or bipolar; 2) conditionality, whether a norm holds under all circumstances; 3) intensity, the degree to which individuals subscribe to the norm; and 4) consensus, the extent to which members of a society share a norm." (Jasso and Opp, 1997, p.974)

A well developed sociological method for answering such questions is the "factorial survey" . In factorial surveys "respondents are asked to judge descriptions of situations which are complex sets of attributes. [...] For this purpose, attributes (i.e. values) of dimensions are combined so that descriptions of situations ensue. Each of the possible and meaningful situational descriptions is judged by respondents"(Beck and Opp, 2001). Subjects answer to a systematic set of *counterfactual* questions. Researchers can thereby elicit the conditional and the unconditional parts of social norms by varying the relevant attributes.

While the polarity and intensity of norms may be measurable with a standard ultimatum experiment, conditionality and consensus was in sociology primarily approached with factorial surveys. The *conditionality* of norms refers to the question as to whether the normative expectations hold under all circumstances or rather depend on characteristics of the situation or the protagonists. "Although

norms are often formulated unconditionally, in everyday life they actually hold only in certain situations, and actors seem to be aware of this." (Jasso and Opp, 1997, p.948). In contrast to the unidimensional measurement of distributive justice norms in the ultimatum game, factorial surveys allow to consider conditionality.

The conditionality of social norms can be operationalized with the condition as to whether certain criteria affect the validity of a norm. Let us illustrate the criterion of conditionality in the framework of distributive justice norms. For example, *equity norms* assert that the individual "input", usually some kind of effort, is the only norm-relevant criterion and determines the individual output to a certain extend. According to Eckhoff (1974), most norms of distributional justice are based on the principle of allocating resources with respect to the criteria of need, status, effort or equality. Those who contribute more, who need more, or who have a higher status shall receive more (Homans, 1961; Blau, 1964; Adams, 1965; Cook and Emerson, 1978). The equity norm may be defined as follows: The more someone contributes to a common project, the higher the share of the returns this person can claim. A vignette of a factorial survey may measure this effort with the level of education or the hours worked per day and ask whether a respective employee is perceived as underpaid, fairly paid or overpaid with a given level of education and working hours (cf. Jasso and Opp, 1997; Jasso, 2006).

The *consensus* of norms considers whether they are commonly shared among subgroups. Consensus can be described with the homogeneity of acceptance concerning the validity of one particular norm within a population. Some actors may adhere to equity norms, while others may adhere, for example, to equality norms. Equality norms can be described with fairness considerations that are independent of criteria such as individual effort, need or status. Here, the material equality of outcomes is the only criterion that ought to be satisfied. More specifically, equality norms prescribe that the return someone claims from a project ought to be independent of her individual contribution. Therefore, the population's heterogeneity in adhering either to equity or equality norms can be used as a measure for consensus. The measurement of equality norms in a factorial survey would require that the respondents regard education or the hours of work as being irrelevant for the justness of earnings of employees. The level of normative consensus could be measured with the population's heterogeneity with respect to the adherence to equity and to equality norms.

Whereas factorial surveys have the advantage to address sociological questions regarding the conditionality and consensus of norms, they suffer from the disadvantage of their entirely hypothetical character, resulting in relatively poor proxies of behavior in real-world settings. Compared to behavioral experiments in sociology or economics, altruistic and pro-social behavior reported in factorial surveys can easily be over-estimated, because answers in a survey are usually not associated with any consequences for the interviewee (Shepelak and Alwin, 1986; Eifler, 2007; Groß and Börensen, 2008; Nisic and Auspurg, 2008). Behavioral experiments avoid this problem of hypothetical results by relating the decisions in the experiment to monetary consequences for the participating subjects; usually, however, with the drawback of a simplistic conception of social norms.

2 An introduction to the strategy method

The *strategy method* was introduced by Reinhard Selten (1967) in an experiment on oligopolies. It is usually applied in experiments with strategic interaction, where the outcome of one person depends on the own as well as on other subjects' decisions. As a matter of course, the respective implementation differs in different experimental setups. The unifying feature of the method is that subjects can condition their decision on every possible action of the other subject.[2] Every player therefore submits a complete *strategy* before the game, stating how he will play the game. More specifically, the player is asked how he will react on every action the other player can – hypothetically and factually – perform. Once a complete strategy is submitted, the outcome of both players is determined by matching the respective strategies.[3] From a neo-classical perspective, the strategy method and "conventional" experiments with factual decisions only have similar predictions, because a *homo oeconomicus* will never reach "irrational" stages of a game. In this sense, the measurement of counterfactuals by the strategy method are not of interest, as they never materialize in the perfect world of *homo oeconomicus*. However, the strong empirical evidence against this stylized fact suggests that humans frequently reach such "irrational" stages. This concern is addressed with

[2] To simplify the issue, we will discuss the 2-person case, but it is generally possible to apply the strategy method to n-person experiments.

[3] The strategy method in real life can be found for example in stock options: The holder of a stock instructs his broker to sell the stock, if the value exceeds a pre-decided threshold. This advices becomes effective only if the stock exceeds the threshold, and remains counterfactual otherwise.

the substantially richer data set compared to non-strategy method experiments. The researcher can learn a great deal from considering these decisions, as we will show beneath.

The *strategy vector method* is an extension of the strategy method, being applied to asymmetric games such as the ultimatum game. A game can be called asymmetric, if the strategy sets of the players are not identical, be it because of different information sets or different experimental roles. In strategy vector method experiments, the players are ignorant of their position (say A or B) in the game. Before the start of the experiment, the strategy vector method asks for every reaction of the player if she is in position A and has to respond to any possible decision of player B. Further, the reverse case is requested, asking for the reaction in role B to all possible decisions of player A. When entering the game, the actual roles are revealed and, like in the strategy method, the predefined strategies for the respective roles determine the outcomes of the game.

3 Method

3.1 Conditionality and consensus in the ultimatum game

The ultimatum game is used as a general framework for measuring normative behavior. One proposer and one responder bargain over a given amount of money, called the *cake*. The proposer offers a share of the cake to the responder. If the responder accepts the offer, she receives the share and the proposer can keep the rest of the cake. If the responder rejects the offer, the cake is lost and nobody receives anything (for illustration see figure 1). The two stages of the game represent the two distinct elements of social norms. Norm compliance is measured with the proposer's offer and punishment of norm violations by responders' rejections.

For the measurement of conditionality and consensus, we carefully extended the setup of the ultimatum game by introducing an element of effort. We operationalized conditionality as the extent of how strong the offer and the acceptance depends on the effort of the participants. Further, we operationalized consensus with the degree of heterogeneity regarding whether subjects adhere either to equity norms and consider the effort as relevant or to equality norms and consider the effort as irrelevant.

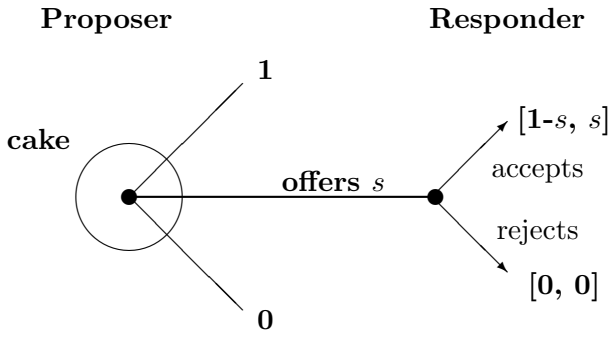

Figure 1: Ultimatum Game. The first value in the squared brackets denotes the outcome for the proposer, the second value denotes the outcome for the responder. The absolute value of the *cake* is normalized to 1.

As a measure of effort, we introduced a knowledge quiz. The subjects received five days before the experiment a seven page long text of a *Wikipedia* entry on the Westminster Palace via email.[4] An accompanying letter informed the subjects that their preparation of the text will influence their possible earnings in the experiment. We chose a rather specific topic to ensure that everybody actually had to learn the text and nobody could benefit from her respective field of studies (such as mathematics or paleontology). In the first step of the experiment, the subjects had to answer respective knowledge questions. Therefore, their different investments of time and effort in the preparation of the quiz reflected effort.

3.2 Design of the strategy game

We applied the *strategy vector method* (Selten, 1967) to the standard ultimatum game. In contrast to the "classic" ultimatum game, the subjects did not have full information about the cake and their respective roles in order to yield unbiased estimates. Although they knew how much they earned in the quiz, they were not told how much their opponent won. The roles were not assigned until everybody made all the decisions, so that each subject had to make the decisions for both roles respectively. If a player earned x Euro in the quiz, the player was asked how much she would offer, if he/she and the opponent together earned x Euro, if they together earned $x + 1$ Euro, ..., $x + 20$ Euro. Figure 5 in the appendix depicts an exemplary screenshot for the proposer. On the next screen, the subjects were

[4] Wikipedia contributors, "Westminster Palace," Wikipedia: The Free Encyclopedia, *http://de.wikipedia.org/wiki/Palace_of_Westminster* (accessed May 04,2008 14:40)

asked for their acceptance threshold if they were in the role of the responder, given he/she and the opponent earned x, $x + 1$,..., $x + 20$. The acceptance threshold denotes the minimum offer the responder is willing to accept. After completing the questions, the computer matched two players from different rooms according to their results in the quiz. The roles of the proposer and the responder were assigned at random and the computer compared the proposer's offer for the actual size of the cake with the corresponding threshold of the responder. The money was paid, if the offer was as high or higher than the responders acceptance threshold; otherwise the money was lost.

3.3 Design of the response game

After completing the strategy game, but *before* learning about the outcome, the participants played the response game. The exclusion of learning effects is an important feature of the design, as it prevents that the subjects adjust their decision to the decisions of their partner in the strategy game. The game was played with the same partner and in the same role as the previous one: If a player was randomly assigned to be a proposer in the strategy game, this player kept the role in the response game. We also did not change the partners to hold the relative effort levels constant and to yield high statistical power by enabling within-subjects comparisons. The subjects were once again endowed with the amount of money they earned in the quiz.

In the first stage of this game, the subjects learned about their roles. On the following screen, the proposer was once again informed about the own effort and, for the first time, about the responder's effort. The proposer was then asked for an offer regarding how to divide the money. This offer was transmitted to the responder, who was also informed about the respective efforts. If the responder accepted the offer, the money was divided accordingly, otherwise the money from the response game was lost. It was clarified that the decision from the response game had no influence on the outcome of the preceding strategy game. Only now, both players were informed about the outcome of the response game and the strategy game. The subjects were paid at the end of both experiments.

3.4 Participants

The subjects were 92 undergraduate students of the University of Leipzig. 47 subjects were male and 45 female, coming from a wide range of academic disciplines. The subjects were invited to register for the experiments via posters and flyers. The participants were randomly drawn from a subject pool with respect to a balanced sex ratio. The experiment was conducted in two separate PC-Labs. Subjects participated in the experiment in groups of two (one proposer and one responder). Proposers and responders were always assigned to separate rooms. Three of our experimental sessions consisted of ten groups, one of nine groups and one of seven groups.[5]

3.5 Procedure

The experiment was conducted using the computer programm *z-Tree*, developed by Fischbacher (2007). At the beginning of each session, the subjects were randomly assigned to one of the computer terminals. Some general instructions regarding the procedure were given on paper, informing the subjects about the consecutive quiz. The subjects had to answer twenty questions concerning the Wikipedia entry with the opportunity to earn up to 20 Euro (one Euro per question). The average earnings of the participants in the quiz were 12.30 Euro (min: 0, max: 18, sd: 3,60). This money was "reinvested" in the strategy and the response game. The average return from this games were 12.15 Euro (min: 0, max: 23, sd: 4,11) in the response game and 8.03 Euro (min: 0, max: 19, sd: 6.57) in the strategy game. After completing the quiz, the subjects received the instructions for the strategy game. The understanding of the game was examined with control questions. The subjects did not learn about the subsequent response game until they made all the decisions in the strategy game. The experiment started when there were no further questions to the experimenter. Communication was prohibited from that point.

[5] In sessions 1 and 4, fewer subjects showed up than expected.

4 Results

4.1 Advantages of the strategy method

In the following, we will discuss the differences between the two experimental methods with reference to our experimental data. We see the major advantage of the strategy method in its capability to measure the norms, which shape the decision-making. For illustration, consider the following situation in our response game: The proposer and the responder earned 8 Euro each in our quiz. The proposer offers 8 Euro to the responder, who accepts. What would the proposer have offered, if the responder had earned only 3 Euro? What if he or she had earned 16 Euro? Would the responder have accepted an offer of 7 Euro, or an offer of 2 Euro? The response game can not answer these questions. The respective data are often ambiguous, as they show only a snap-shot within a game.

Figure 2 depicts representative cases from our data. The proposers' decisions in the response game are almost indistinguishable (see figure 2(a)). Responder and proposer earned the same amount in the quiz, and the proposer offers to split the cake equally. If we had only this data at hand, we would probably presume that there is consensus about the applicable norm. But the data from the strategy game reveal a different picture. Player 3 in the left row offers half of the cake, if both contributed the same. If the contributions are different, player 3 divides according to the equity norm, such that relative contributions equal relative outcomes. In this sense, the underlying norm of distributive justice is conditional on individual effort. In contrast, consider player 29 in the right row. This player also offers about 50% in the response game. But the behavior in the strategy game reveals a different underlying norm, as offers do not differ with differing relative contributions. Thus, player 29 does not respond to the criterion of effort and adheres to our definition of the equality norm. Finally, the strategy method can reveal the behavior of player 20 in the middle as violation of the normative imperative of consistent behavior. As a proposer, player 20 offers according to the equity norm as long as player 20's relative contributions are higher than the responder's contributions to the cake. However, this player switches to the equality norm, if the responder contributed more. Thus, player 20 picks the respective norm that fits his/her interests best. Figure 6(a) in the appendix gives an overview over all proposers' decisions in the response game and an impression of the frequencies of respective social norms.

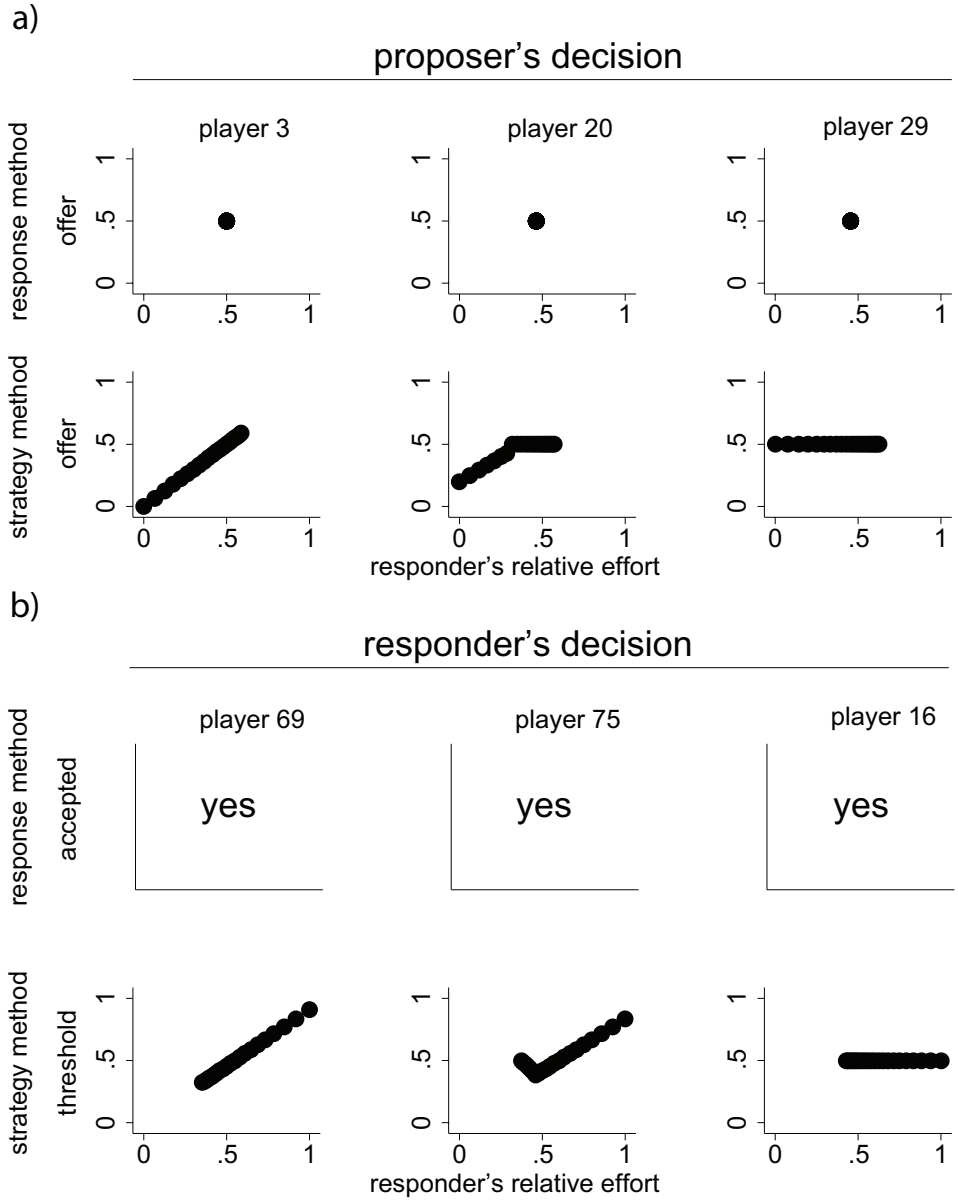

Figure 2: Patterns of offers in the strategy game and the response game (a) and patterns of acceptance in the strategy game and the response game (b). The upper panel in a) represents decisions from the response game, the lower panel decisions from the strategy game. One column refers to decisions of the same proposer or responder respectively. The abscissa depicts the responder's relative contribution to the cake, given by $\frac{C_R}{C_R+C_P}$ where C_i describes the individual gain from the quiz and the index i the respective role (R=responder, P=proposer). The ordinate describes the proposer's relative offer to the responder, given by $\frac{O}{C_R+C_P}$, with O denoting the absolute offer. The upper panel in b) describes whether the respective responder accepted the offer in the response game. The lower panel describes the acceptance threshold of the same responder, given as the smallest acceptable offer for given relative effort.

The situation is similar for the responders, as described in figure 2(b). The response method only yields "yes/no"-decisions. Therefore, the response game only provides relatively crude information as to whether the offer was high enough. The strategy method reveals different patterns and more precise information. In conclusion, figure 2 illustrates the capability of measuring conditionality and consensus of social norms by means of the strategy method.

An additional difference between strategy and response game is their different length. The strategy game lasted about one hour, while the response game was completed in 15 minutes on average (including instructions and control questions). Time is a crucial factor in experimental research, as the participants' payment is partly based on their time in the lab. However, the advantage of the strategy method with its generation of a multiple of the data compared to the response-method experiments can outweigh the time-factor. To our experience, resources invested into strategy-method experiments usually pay off in terms of the "data/money ratio".

4.2 Critical analysis of the differences in the response modes

We will continue our analysis by comparing the outcomes of the strategy method with those of the response method. In order to achieve a robust comparison, we consider in the strategy game only those decisions that are payment-relevant; those decisions are excluded, which asked for behavior with counterfactual pie sizes. This means that from the 42 decisions of every subject in the strategy game, only 1 is considered in the remainder. Furthermore, the number of players per role reduces to 46, as every player plays either as proposer or as responder in the response game.

Apart from economic considerations, both methods differ in some of their psychological features. The response method is often described as emotional or "hot", while the strategy method is considered more rational or "cold" (Brandts and Charness, 2000). The argument goes that being confronted with a variety of related decisions generates different behavior compared to one single decision. One reason for this is that subjects may feel obliged to behave "consistently" (Oxoby and McLeish, 2004). Answering a set of questions instead of only one may trigger subjects to follow the 'golden rule' not to do something one would not accept if it

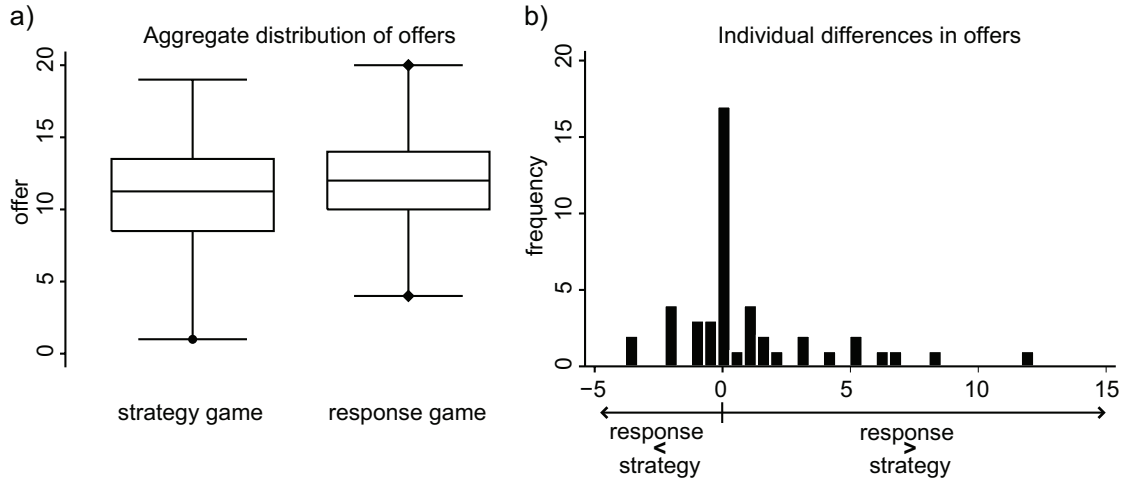

Figure 3: Offers in the strategy game and the response game on the aggregate level (left) and differences in offers on the individual level (right). There are no statistically significant differences on the aggregate level, but only 17 out of 46 proposers offer exactly the same in both games. Twelve subjects offer less and 17 subjects offer more in the response game than in the strategy game.

was done to oneself. The strategy method may promote therefore overly consistent behavioral patterns. More specifically, subjects may choose opportunistically the rule which enhances their self interest and would switch between different rules if it was possible to compare the same subjects in different treatments. Normative expectations are often calling for consistency (Elster, 1989) so that the strategy method is a particularly well-suited tool for measuring social norms.

First, we analyze aggregate effects such as the median offer in both experiments and the respective variances. Figure 3(a) indicates that the (aggregated) offers do not differ in both methods. A Wilcoxon signed rank test confirms this impression (p=0.17). Further, we estimated the difference of offers with a linear OLS regression model using treatment (strategy vs. response experiment) as the only predictor for the offer. Model (1) in table 1 reveals that this main effect is not significant (b=0.035, p>0.05). Moreover, we analyzed whether the two experiments yield different results regarding the importance of effort for the proposer's offer. Therefore, we added the effort as a predictor and, more importantly, the interaction between treatment and effort. As with the simple analysis, the experiments do not generate different proposer behavior with regard to effort, as can be seen from the interaction term in model (2) of table 1 (b=0.106, p=0.625).

	(1) Offer b/p	(2) Offer b/p
Treatment (response = 1)	0.038	-0.012
	(0.052)	(0.910)
Effort		-0.013
		(0.934)
Treatment × Effort		0.106
		(0.625)
Constant	0.434	0.440
	(0.000)	(0.000)
Subjects	46	46

p-values in parentheses

Table 1: OLS regression, estimating the differences in offers between strategy and response game experiment. The variable "Treatment" is a dummy variable, taking the value 1 if decisions are elicited in the response game and 0 for those in the strategy game. "Effort" is given by the relative contribution of the responder to the common pool. "Treatment×Effort" describes the interaction of both terms. The p-values regarding the simple treatment effect (model 1) and the importance of effort (model 2) are above the critical value of 0.05, yielding no significantly different offers in the two experiments.

We proceed with decomposing the aggregate results into single decisions. Figure 1(b) depicts the differences between a proposer's offer in the strategy game and the same person's offer in the response game. In 17 cases, proposers did not react differently in both games, while another 17 proposers offered more and 12 offered less in the response game than in the strategy game. The distribution is slightly right-skewed, as there are more people giving much less in the strategy game compared to the response game.

While there are little differences with respect to offers, we find great differences in the acceptance behavior of responders. About 40% of the responders rejected the offer in the strategy game (17 out of 46) but only one responder rejected in the response game. A Pearson's χ^2-test reveals that this difference is highly significant (p <0.001). Additionally, we estimated a logistic regression to test for the treatment effect and found also highly significant differences (see model (1) in table 2; b=3.273, p=0.003)). In addition, we analyzed whether the effort has a different effect on acceptance behavior in the two experiments. Therefore, we defined the continuous variable "generosity", describing whether the offer is kind in the sense

	(1) Accepted b/p	(2) Accepted b/p
Treatment (response = 1)	3.273	8.392
	(0.003)	(0.000)
Generosity		0.519
		(0.005)
Treatment × Generosity		-0.559
		(0.565)
Constant	0.534	-4.585
	(0.084)	(0.016)
Subjects	46	46

p-values in parentheses

Table 2: Logistic regression, estimating the effect of differences in acceptance of offers between strategy and response experiment. The variable "Treatment" is a dummy variable, taking the value of 1 if decisions are elicited in the response game and 0 for those of the strategy experiment. "Generosity" is given by the relative offer minus the relative contribution of the responder to the overall amount of money to be distributed (offer-effort). The variable is positive, if the proposer offers a greater share to the responder than he/she contributed. "Treatment ×Generosity" describes the interaction of both terms. Model 1 demonstrates a significantly higher acceptance rate of offers in the response game. Model 2 reports no significant differences in the two experiments regarding the importance of efforts for the acceptance. Hence, the response method and strategy method do induce significantly different probabilities of acceptance.

that the offer represents a surplus to the responder. It is positive, if the proposer offers more than the responder contributed to the cake and negative if the offer is below the responder's effort. As expected, we find a positive correlation between "generousity" and the probability of acceptance. However, the interaction term does not add any explanatory power, indicating that the generosity has similar importance in the two experiments. Note, however, that the insignificance of the last result may be mainly driven by the fact that it relies on only one rejected offer in the response game, and should hence not be over-interpreted. Nevertheless, the probability of an accepted offer is much higher in the response game than in the strategy game.

Somewhat more puzzling are the findings from figure 4. This shows that those responders who accepted in the response game rejected even higher offers in the

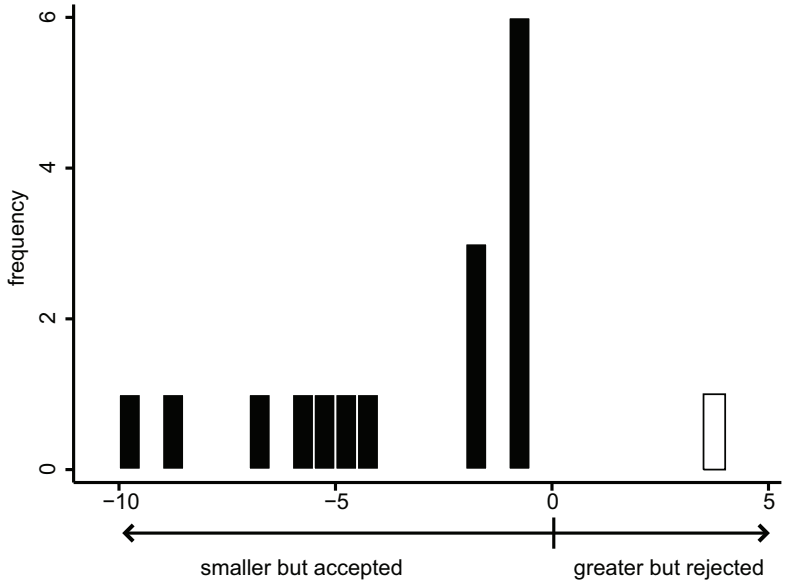

Figure 4: Difference between accepted and rejected offers in response game and the threshold in the strategy game. All accepted offers in the response game were up to 10 Euro less than the responders threshold in the strategy game. The only rejected offer was 4 Euro higher than the respective threshold in the strategy game.

strategy game. Further, the responder who rejected in the response game accepted a lower offer in the strategy game. In our view this finding can be understood as a result of the strategy method. Being confronted with a whole set of questions at the same time provokes to give consistent answers which follow a general rule. When asked for a single acceptance decision in the response game, the own rule is, however, often disrespected.

Though there were 17% of participants who made offers which they would not have accepted themselves, a majority of 83% gave "consistent" offers. This gives weight to the conclusion that the subjects were 'cold' in the sense that they state what they regard as a just distribution, rather than the least acceptable offer. The respective individual acceptance thresholds from the strategy game can be found in figure 6(b) in the appendix. In contrast, the response method provokes subjects to think whether they either preferred to stick to their normative expectations for the price of receiving nothing, or take the money instead. As a result, most of them decided to abandon their norm and accept the offer in the response game.

5 Discussion

Our study investigated the potential of behavioral experiments to measure social norms. We extended the ultimatum game by implementing the "strategy method" and therewith extended the analysis of social norms in experimental economics to a sociological one by measuring sociological concepts such as conditionality and consensus of social norms. The experiment started with a real effort task, determining the individual amount of the participants' bargaining money. Participants showed different levels of effort and had to contribute their respective money in a common pool. Then, bargaining decisions over this common pool were elicited using the strategy method, which allows for the measurement of distinct social norms regarding fair divisions of the common pool between proposer and responder. It could be shown that the strategy method allows for the measurement of conditional bargaining norms such that the proposed and requested amount of money was conditional on the individual effort. Second, it could be demonstrated that the strategy method enables the measurement of the level of normative consensus. The data shows that a variety of social norms coexists in the population. For example, some actors adhere to equity norms, which prescribe that the common money should be allocated according to the individual contribution and, while others comply with equality norms, prescribing equal divisions, irrespective of effort.

We evaluate the validity of our method of measuring social norms by a methodological experiment, comparing results from the first experiment with the strategy method with those from an additional, "conventional" ultimatum game experiment. In the second experiment, the same real effort task was employed, but bargaining behavior was elicited with the so-called "response" method. While the proposers' offer did not differ between both experiments, more offers were rejected in the strategy method experiment. Hence, the two methods measure (slightly) different concepts, though both measure actual behavior.

Our results are consistent with those of previous studies, which find differences in behavior due to the response mode (Andrew et al., 1994; Güth et al., 2007). We agree with Roth (1995, p. 323), who points out that "having to submit entire strategies forces subjects to think about each information set in a different way than if they could primarily concentrate on those information sets that arise in the course of the game." However, we cannot confirm the previous finding that

the response method elicits more emotions from people and the strategy method rather selfish, calculating and rational behavior, as found by Loewenstein (1996). Contrariwise, we find that responders show less punishment of "unfair" offers, that is, they accept more offers, when asked in the "hot" response mode, compared to the "cold" strategy mode.[6] Our results are therefore consistent with the findings of Blount and Bazerman (1996), who report experimental evidence that acceptance of offers is lower when asked for a threshold. In our view, the strategy method fosters that subjects refer to a greater extent to social norms, are more consistent and think rather in terms of general rules than of single decisions.

We can understand our findings with reference to a "rawlsian" perspective on social norms (Rawls, 1971). The strategy vector method simulates a "veil of ignorance", while the response method can be regarded as a test as to whether subjects actually comply with their general rules in specific situations. More specifically, the strategy *vector* method makes participants think of a perspective from different angles. Not only are they confronted with "all" states of the world, they are furthermore forced to put themselves in both positions; the proposer and the responder. Facilitated by the ignorance about the respective future position in "society", our design virtually puts the subjects behind the "rawlsian veil". The influence of social norms and the application of general principles are therefore stronger when asked with the strategy method, lending support to its suitability for measuring social norms.

Beyond the relation with previous experimental studies in economics do our findings relate and confirm the findings from factorial surveys in sociology. First, the lack of normative consensus regarding equity and equality norms of distributive justice has been discovered by means of factorial surveys (Jasso and Wegener, 1999). Second, our findings from comparing the more "fictitious" strategy method with the more "observational" response method are similar to previous findings, comparing the "fictitious" factorial survey with "observational" field data. Recent comparisons regarding pro-social behavior demonstrate that factorial surveys rather elicit normative expectations and general rules whereas field studies evaluate whether subjects are actually willing to comply with these rules in specific situations (Shepelak and Alwin, 1986; Eifler, 2007; Groß and Börensen, 2008; Nisic

[6] The terms "hot" and "cold" with respect to decision modes were coined by Brandts and Charness (2000).

and Auspurg, 2008). This finding that factorial surveys elicit higher rates of pro-social behavior than those found in the field, relates to our findings of higher rates of pro-social behavior in the strategy compared to the response experiment with regard to the punishment of norm violators by rejections of their offers.

In conclusion, the strategy method provides the social scientist with a reasonable measure of social norms using counterfactual questions, which are nevertheless associated with real, monetary consequences. Thus, controlled laboratory and field experiments should be considered as an additional tool in the triangulated assessment of social norms. Findings from the laboratory complement results from non-experimental studies, revealing a more realistic picture of norm-adhering behavior. The increased consideration of laboratory experiments in sociology would foster the understanding of the micro-mechanisms generating societal macro-outcomes, whose properties are though measurable with conventional methods such as surveys, but hardly understandable without the fine-grained complements of laboratory research.

Appendix

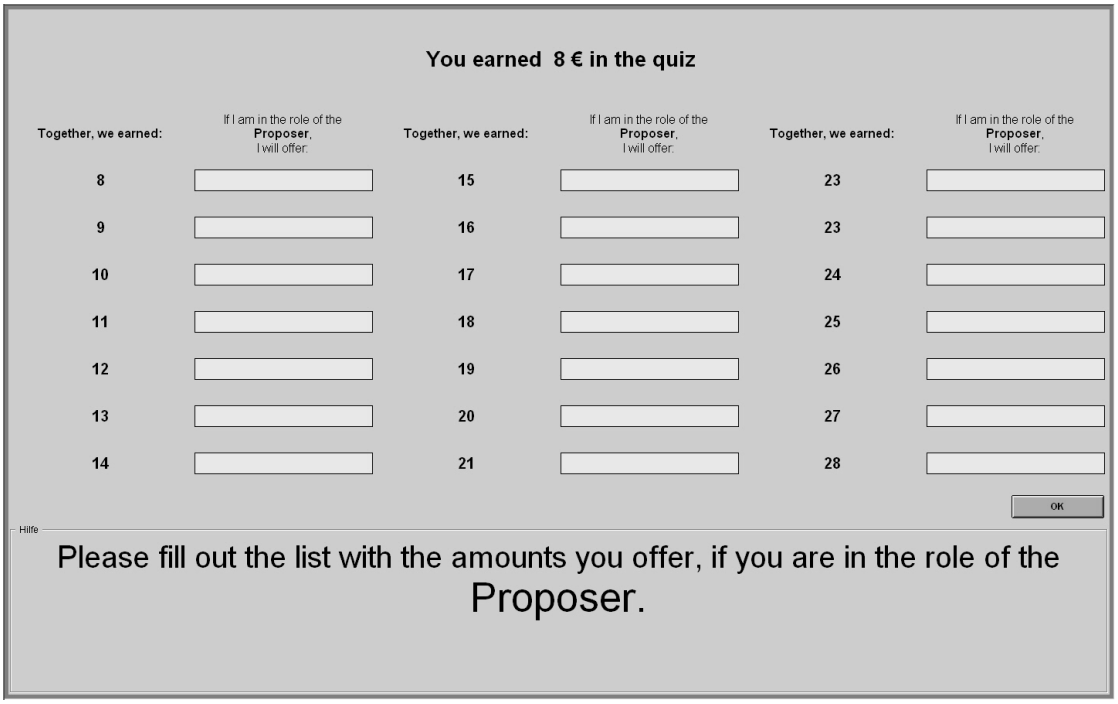

Figure 5: Exemplary screenshot for a player in the role of a proposer in the response game.

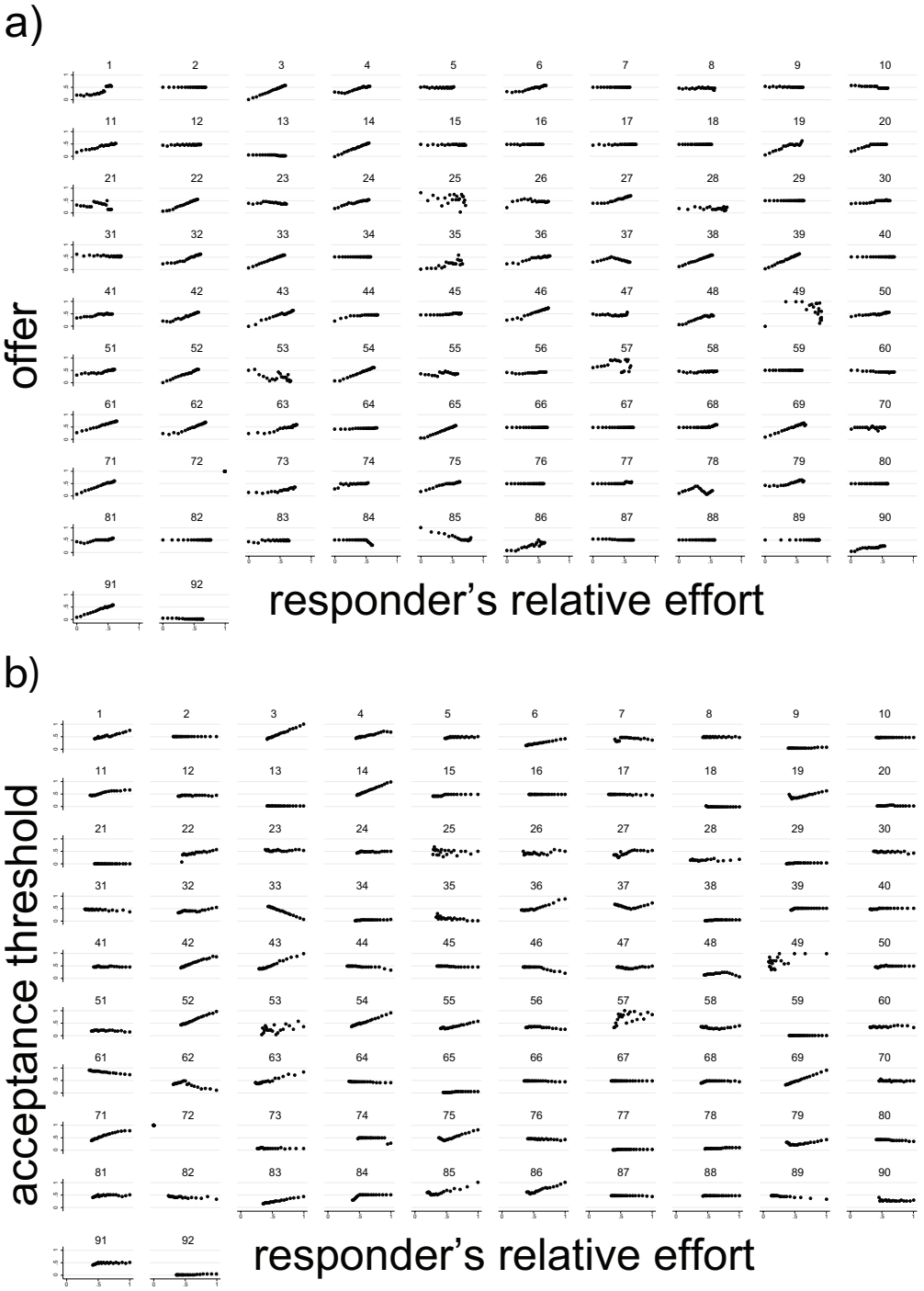

Figure 6: Strategy profiles of all participants in the strategy game. The upper panel depicts the offers in the role of the proposer, the lower panel depicts the acceptance threshold of the same player in the role of a responder. The abscissa depicts the responder's relative contribution to the cake, given by $\frac{C_R}{C_R+C_P}$ where C_i describes the individual gain from the quiz and the index i the respective role (R=responder, P=proposer). The ordinate describes the proposer's relative offer O to the responder, given by $\frac{O}{C_R+C_P}$ (a)) and the respective relative threshold T as a responder, given by $\frac{T}{C_R+C_P}$. We can classify the behavior according to equity and equality norms. Adherence to equity norms is reflected by a diagonal line from the lower left to the upper right, i.e. the offer/threshold is strictly increasing in the effort. Adherence to equality norms is reflected by a horizontal line, i.e. the offer/threshold is independent of the effort.

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