E C O N O M I C S B U L L E T I N

The Uncontrolled Social Utility Hypothesis Revisited

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Abstract

The experiment disentangles communication and social effect in face−to−face communication. The results question the previous interpretation of communication effects in ultimatum bargaining, and suggest that separate processes, both of a strategic and of an affective−social nature induce cooperative outcomes.

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1. Introduction

Typically experimental economists evaluate economic situations in anonymous experiments. Subjects interact via the computer, where they type in their decisions, and are matched anonymously. Much effort is done in keeping subjects separate and to avoid subject communication. This might be due to the fact that pre-play face-to-face communication is known to influence strategic choice.

In an experiment, described by Roth (1995), face-to-face communication proved to induce lower disagreement rates and higher equal-split rates when compared to no communication in ultimatum bargaining. The present experiment was conducted in order to distinguish between two possible hypotheses regarding the effects of face-to-face communication, which Roth (1995) refers to as the uncontrolled social utility hypothesis, and the communication hypothesis.

The uncontrolled social utility hypothesis suggests that in the social environment created by face-to-face communication, preferences become hard to control. For example, people will probably be less likely to take advantage of other people who are similar to themselves, or who are part of their in-group (cf. Dawes, 1990).

The communication hypothesis, on the other hand, emphasizes the nonverbal channels available in face-to-face communication. Thus, face-to-face communication is not qualitatively different from written communication, but more efficient as it uses multiple channels, which are usually more reliable than the written or verbal channels alone.

Roth's results show a significant decrease in ultimatum rejections (33% in the control treatment, 4% and 6% in the unrestricted and restricted communication treatments, respectively) and increase in mean offers ($4.27 out of $10 in the control treatment, $4.85 and $4.70 in the unrestricted and restricted communication treatments, respectively). The increase in mean offers corresponds to the higher rates of equal split offers in the unrestricted communication treatment, (75% compared to 31% in the control treatment and 39% in the restricted communication treatment). When offers around the equal split ($4.50-$5.50) are examined, high rates are observed in both communication treatments (83% and 82% in the unrestricted and restricted communication treatments respectively, 50% in the control treatment). Based on these findings, Roth (1995) rejected the communication hypothesis, claiming that his restricted communication treatment precludes strategic communication.

Note, however, that the support for this claim is not unequivocal, since the results do not rule out strategic effects. It is important to note that the disagreement rates do not capture the responder's behavior, as responders in different treatments are acting on the basis of different offers. Once the proposers play in a cooperative way, making relatively high offers, disagreement rates drop regardless of the responder's implicit acceptance threshold. In the current experiment behavior is studied using the strategy method, thus enabling an unconfounded test of the assumption about responders' communication-induced cooperativeness.

2. Experimental Design and Procedure

In the current experiment subjects participate in an ultimatum game (Güth et. al, 1981) in either play or strategy method. The three treatments described by Roth (1995, p.278) – no communication, restricted, and unrestricted communication - are replicated using

video conferencing. In the restricted communication treatments, subjects do not know the game they are about to play when they engage in pre-play face-to-face communication in the first round.

The sessions took place in the video laboratory of the Max Planck Institute in Jena, Germany in June 2002 for play method and in November 2003 for strategy method. To prevent the influence of possible gender specific communication effects female students of Jena University were recruited, which was done randomly via email using an online recruitment system (Greiner 2004). Participants were bachelor-level and master-level students from different field of studies, with less than 15% of them studying Business and Economics. Altogether 48 subjects participated in 6 sessions which lasted about 90 minutes each. A pie of 9 € has been used in the experiment. For pay-off one round was randomly determined. Average total pay-offs were 8.08 € for proposers and 7.42 € for responders including a 4 € show-up fee.

Proposers and Responders arrived separately and were each led to a sound proof cabin. Participants were given written instructions, which were (announced to be) the same for both proposer and responder roles. In the unrestricted communication treatment the game specific instructions were provided before the communication stage. In the restricted communication treatment the participants only knew that they would play a 2-players game at this stage, and received the full instructions following the first communication stage.

In each round the play stage followed a two minutes communication stage. During the communication stage each participant could see herself and the other player onscreen. In the baseline treatment subjects merely waited for two minutes and could not see their partner.

The play stage started with the proposers indicating their offer, which was restricted to a vector of $x_2 = \{0.5,1.0,\ldots,8.0,8.5\}$. Responders in the play method sessions were then asked to respond to the proposal. Responders in the strategy method sessions were asked for a response for each of the 17 possible offers, which were presented in a random order. Then, a strategy method responder was presented with an overview and was allowed to change specific decisions. The decisions forms were computerized using zTree (Fischbacher 1999).

Four rounds, each including a communication stage and a play stage, were played, so that each proposer played with each responder in a stranger matching design. No feedback was given between rounds. Subjects participating in communication treatments were shown a still picture of all four participants they had played with, and were asked to rate each one using the semantic differential (Osgood et al., 1957). Finally, decisions and results of each round were provided. One round was randomly chosen for the actual payoff. The participants were paid out in cash and left the laboratory. Proposers left immediately, whereas the responders had to wait a quarter of an hour in their cabins.

3. Results

Although offers in the control treatment were lower than those observed by Roth (1995, p. 297), the effects observed there for proposers' data are qualitatively replicated: Generally, communication induce lower disagreement frequencies, following higher offers and a higher rate of near-equal offers (see Table 1 for comparisons to the baseline). Average offers do not differ between unrestricted and restricted communication, though significantly more equal split offers were observed in the unrestricted than in the

Table 1: Proposer and responder behavior

Treatments	*Mean offers (share of total pie)*	*Std. error*	*N*[a]	*Frequency of equal splits x_2= 4.50 €*	*Frequency of near-equal splits x_2=4.50 ± 0.50 €*	*Disagreement frequ.*	*Average threshold (share of total pie, strategy method only)*	*Std. error*	*N*
No communication	0.345	0.134	32	0.22	0.34	0.125	0.367	0.08	16
Unrestricted communication	0.467***	0.077	32	0.75xxx	0.78 xxx	0.063	0.467+++	0.13	16
Restricted communication	0.451***	0.073	32	0.37	0.81 xxx	0.029	0.244***	0.12	16

[a] Proposer data of play and strategy method sessions have been combined. In the experiment the decision environment for proposers in both methods was equal beside the knowledge of the responder decision method.

*** Higher than baseline, $p<0.01$, Mann-Whitney test, one-sided.

+++ Lower than baseline, $p<0.01$, Mann-Whitney test, one-sided.

xxx Higher than baseline, $p<0.01$, χ^2 test, one-sided.

restricted communication treatment ($\chi^2=9.143$, $p<0.01$, one-sided). Recall that Roth (1995) interpreted these results as supporting the uncontrolled social utility hypothesis.

Nevertheless, when we turn to the data obtained using the strategy method, which enables us to examine responders' strategy vector, a different pattern emerges. Even though the offers are qualitatively similar to the offers obtained by Roth (1995, p.297), an evaluation of the acceptance thresholds[1] provides evidence for less cooperative responders in the unrestricted communication treatment who reject significantly higher offers compared to the baseline (Table 1). In contrast, acceptance thresholds in the restricted communication treatment are significantly lower than the baseline. This pattern suggests that the high offers in the two communication treatments are generated by different processes.

When subjects discuss the game, responders make ultimatums of their own, thus equal split offers are driven by a strategic effect. The following translated quote from an unrestricted bilateral session underlines this point:

Responder: Well, make a good offer.
Proposer: You are really so two fisted? You really say 45 and everything else will be refused?
Responder: Yes, of course. Why not?
Proposer: Because you run the risk of getting nothing.
Responder: But so do you. And I don't see why I should give anyone a donation. Why should I?

[1] Out of 48 strategy vectors obtained over the three treatments, 46 were monotonic (i. e. if an offer x_2 was accepted, then all offers $y>x_2$ were also accepted). In one case, the lowest and highest offers were rejected (for a discussion of non-monotonic strategy vectors see Güth et al., 2003), and in one case a single high offer was rejected (probably due to a typing error made by the subject in the first round). As all offer vectors were monotonic between the equal split and the minimum offer, we reduce the vector to the acceptance threshold, defined as the lowest offer accepted.

Conversely, when subjects are prohibited from discussing the game, the higher offers (but not necessarily equal splits) are driven by social effects. This dichotomy was not evident in the play-method data, as the high offers in both treatments had caused low conflict rates, regardless of responders' strategies.

A factor analysis of the subjects' ratings revealed a single, general impression, variable. This variable was significantly correlated with actual decisions (i.e. a more positive rating of a responder tends to follow a high offer) only when communication was unrestricted (Kendall's τ=0.661, $p<0.01$), possibly because the strategic bargaining provided a strong basis for the ratings.[2]

4. Discussion

The results question the previous interpretation of communication effects in ultimatum bargaining. The experiment reported by Roth (1995), applying play method, was not able to uncover responders' strategies, as the observed disagreements rate was driven primarily by proposers' offers. Comparison between treatments was meaningless in this respect, as the responders in separate treatments were faced with different decision tasks. In the current study, however, the use of the strategy method made it possible compare responders' strategies in different treatments. Thus, the similar disagreements rate obtained by Roth (1995) for unrestricted and restricted pre-play communication is now shown to result from different processes.

Although the effects of restricted social communication may derive from considerations of social utility, which increases cooperative behavior, in the case of unrestricted communication, when the players can discuss the game, the low disagreement frequency does not stem from increased cooperation, as the responders are in fact acting in a less cooperative manner. Rather, the result derives from strategic coordination on the egalitarian outcome, as evidenced in the significant difference between the likelihood of an exact equal split offer with unrestricted and restricted communication.

To conclude, the results of the reported experiment suggest that pre-play communication effects may be the outcome of both strategic and social-affective processes, depending on the protocol of the communication. Game-relevant communication affects the strategic considerations of the players, whereas social communication may induce cooperative behavior through affective processes. The influence of the protocol may come about by means of inducing different frames for the interaction. When players are making a decision following a bargaining discussion, they become more sensitive to the strategic considerations, and conversely, when the decision making follows a social talk, the players become more sensitive to social cues and norms.

5. References

Dawes, R. M., 1990, Social dilemmas, economic self-interest, and evolutionary theory, in: D. R. Brown and J. E. K. Smith, eds., Recent Research in Psychology: Frontiers of Mathematical Psychology: Essays in Honor of Clyde Coombs (Springer, New York).

[2] No ratings were obtained for the unrestricted treatment with the strategy method session.

Fischbacher, U., 1999, z-Tree - Zurich Toolbox for Readymade Economic Experiments - Experimenter's Manual, Working Paper Nr. 21, Institute for Empirical Research in Economics, University of Zurich.

Greiner, B., 2004, An Online Recruitment System for Economic Experiments, in: K. Kremer and V. Macho, eds., Forschung und wissenschaftliches Rechnen 2003: Beiträge zum Heinz-Billing-Preis 2003, GWDG Bericht 63 (Ges. für Wiss. Datenverarbeitung, Göttingen) 79-93.

Güth, W., C. Schmidt and M. Sutter, 2003, Fairness in the Mail and Opportunism in the Internet - A Newspaper Experiment on Ultimatum Bargaining, *German Economic Review* 4(2): 243-265.

Güth, W., R. Schmittberger and B. Schwarze, 1982, An experimental analysis of ultimatum bargaining, *Journal of Economic Behavior and Organization* 3(4): 367-388.

Osgood, C. E., G. J. Suci and P. H. Tennenbaum, 1957, The measurement of Meaning (University of Illinois Press, Urbana, IL).

Roth, A. E., 1995, Bargaining experiments, in: J. H. Kagel and A. E. Roth, eds., The Handbook of Experimental Economics (Princeton University Press, New Jersey).

A1. General Instructions

Please read the following instructions carefully. Instructions are identical for every participant. The experiment consists of 4 rounds. You are able to earn money during the experiment. The amount you earn depends on your own decisions and the decisions of other participants of the experiment. In addition, for showing up on time you are paid 4 €. Amounts will be displayed in ECU (Experimental currency unit) during the experiment. 10 ECU are converted in 1 €.

There are 8 subjects participating in the experiment. The four participants in cabins 5 – 8 decide as type X. The four participants in cabins 1 – 4 decide as Y. The number of your cabin is printed at the door. In each round a participant of type X interacts with a participant of type Y. During the following 4 rounds you interact with no other participant twice.

At the end of the experiment one round will be determined randomly for payoffs. Your particular payoff in ECU during this round will be converted to Euro and paid out together with the 4 € show-up fee in cash after the experiment. Participants of type X and Y will be paid out separately and will leave the building separately. Since X and Y participants were also invited at different date, participants of different types will not meet each other at any point in time. There are female participants only.

Baseline – no communication

You participate in an experiment without video- and audio communication, which means that neither you will be able to see your partner at any point during the experiment, nor your partner will be able to see you. The audio and video components are deactivated.

You will receive a separate sheet that describes the exact course of events during each round.

Restricted communication treatment

At the beginning of each round you can communicate with the assigned participant of the other type via video conference for 2 minutes.

Both participants are able to see and hear their assigned partners. You are not allowed to talk about the content of the experiment. This will be controlled by us. Any attempt to break this rule will result in exclusion from payments.

After the initial 2 minutes of communication are over, you will be handed a separate sheet that describes the content of the game.

Unrestricted communication treatment

At the beginning of each round you can communicate with the assigned participant of the other type via video conference for 2 minutes.

Both participants are able to see and hear their assigned partners and you are free to decide what you talk about.

A2. Game Instructions

After the communication phase the communication via audio and video will be interrupted and the X/Y pairs interact via the computer according to the following rules:

In each round X proposes how to split the available pie of 90 ECU between Y and himself. Therefore X marks down the amount reserved for Y on the screen (that means the rest of the pie is reserved for X).

Instructions for play method

This proposal will be announced to Y, who is able to accept or reject this proposal. In case Y accepts, X and Y receive the distribution specified by X. In case Y rejects, both participants receive nothing.

Instructions for strategy method

This proposal will not be announced to Y. Y will mark for all feasible proposals, that is X=85 and Y=5, …, X=5 and Y=85, whether to accept or reject. The possible distributions will be presented in random order. At the end there is the option to change entries on an overview screen.

The payoff will be determined the following way: the proposal of X will be compared to the corresponding decision of Y. In case Y accepted, X and Y receive the distribution specified by X. In case Y rejects both participants receive nothing. This means each decision of Y may determine the payoff.

Control questionnaire

The following three questions test whether you understand the described rules of the game. Please try to answer the questions the best you can. Before starting the experiment we will check whether you answered the questions correctly.

Imagine a type X participant made a proposal of 15 ECU to Y and Y accepts this proposal: What is the amount X and Y receive:

X receives _____ECU Y receives _____ ECU

Imagine a type X participant made a proposal of 70 ECU to Y and Y rejects this proposal : What is the amount X and Y receive:

X receives _____ECU Y receives _____ ECU

Imagine a type X participant made a proposal of 5 ECU to Y and Y accepts this proposal : What is the amount X and Y receive:

Y receives _____ECU X receives _____ ECU

A3. Instructions Questionnaire

Please mark on the questionnaire the number of the cabin of the subject you are rating. To evaluate your impressions of the different subjects on the video screen we would like to ask you to rate the subjects according to the following scales. We will display on the monitor all four subjects you were interacting with at once. Please fill out the questionnaire for each person separately. Please mark according to the number displayed on the door (behind the subjects) which person you are currently evaluating, and fill in all of the scales.

Following are the instructions on how to use the scales. In case you are not sure how to fill out the questionnaire you can have a look at this instruction again.

In case you find a person to rate very similar to an attribute at the end of the scale, then check one of the following boxes

active	x	o	o	o	o	o	o	passive
active	o	o	o	o	o	o	x	passive

In case you find a person to rate quite similar to an attribute at the end of the scale, then check one of the following boxes

active	o	x	o	o	o	o	o	passive
active	o	o	o	o	o	x	o	passive

In case you find a person to rate slightly similar to an attribute at the end of the scale, then check one of the following boxes

active	o	o	x	o	o	o	o	passive
active	o	o	o	o	x	o	o	passive

Naturally, the horizontal direction of your cross depends on which of the two attributes on the scale describes the person you are rating best.

When the person you are rating can be described as neutral with regard to the two attributes, that is, both attributes apply to the person to the same extent, you should check the box in the middle.

active	o	o	o	x	o	o	o	passive

Please mark down whether you knew the person you are rating before. Please mark whether you have just seen the person (e.g. at university) but do not know her personally, or whether you know your partner personally.

A4. Computerized Questionnaire

For every partner the following scales had to be rated by the receiver of communication:

active	o	o	o	o	o	o	o	passive
welcome	o	o	o	o	o	o	o	displeasing
agile	o	o	o	o	o	o	o	calm
beautiful	o	o	o	o	o	o	o	ugly
strong	o	o	o	o	o	o	o	weak
influential	o	o	o	o	o	o	o	non influential