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Selfish-biased conditional cooperation: On the decline of contributions in repeated public goods experiments

Tibor Neugebauer[a,*], Javier Perote[b], Ulrich Schmidt[c,d], Malte Loos[c,d]

[a] University of Luxembourg, Fac. Law, Economics and Finance, Luxembourg School of Finance, Luxembourg
[b] University Rey Juan Carlos, Fac. Ciencias Jurídicas y Sociales, Madrid, Spain
[c] Christian-Albrechts-Universität zu Kiel, Institut für Volkswirtschaftslehre, Kiel, Germany
[d] Kiel Institute for the World Economy, Kiel, Germany

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ABSTRACT

In the recent literature, several competing hypotheses have been advanced to explain the stylized fact of declining contributions in repeated public goods experiments. We present results of an experiment that has been designed to evaluate these hypotheses. The experiment elicits individual beliefs about the contributions of the partners in the repeated game and involves between-subjects variation on information feedback. The data favor the hypothesis of selfish-biased conditional cooperation as the source for the declining contributions over the competing hypotheses.

1. Introduction

It is a well-documented, stylized fact that voluntary contributions in public goods experiments decline with repetition (Ledyard, 1995). Various theories have been advanced which may account for this stylized fact. Some researchers on voluntary provision of public goods are convinced that people are conditionally cooperative;[1] in experiments, participants contribute the more others contribute even if free-riding is a dominant strategy. However, conditional cooperation seems to exhibit a selfish bias, as contributions increase less than fully proportionally with those by others (Fischbacher et al., 2001).

* Corresponding author. Tel.: +352 466644 6285; fax: +352 466644 6835.
E-mail address: Tibor.Neugebauer@uni.lu (T. Neugebauer).

[1] (C.f. Ockenfels, 1999; Sonnemans, Schram, & Offerman, 1999; Keser & van Winden, 2000; Brandts & Schram, 2001; Fischbacher, Gächter, & Fehr, 2001; Levati & Neugebauer, 2004; Croson, Fatas, & Neugebauer, 2005; Fischbacher & Gächter, 2006; Croson, 2007).

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Hence, the selfish bias in conditional cooperation in combination with adaptation of beliefs about the others' contributions cooperation can explain a downward spiral of contributions. Alternative hypotheses that account for the decline of contributions include strategic play in early stages (Andreoni, 1988; Sonnemans et al., 1999) or errors that diminish over time (Andreoni, 1995; Palfrey & Prisbey, 1997).

This article contributes to the investigation into the psychological motives for the contribution decline in repeated public goods experiments. For this purpose we have designed and run experiments in which we vary the information feedback and elicit the individual beliefs about others' contributions. The design, which is described in detail in Section 2, allows a test of the aforementioned competing hypotheses (reviewed in Section 3) under the assumptions that errors in contributions are uncorrelated to the beliefs about others' contributions and that strategic play is impossible if no information is divulged. The data, which we report in Section 4, favor selfish-biased conditional cooperation as the source for the downward spiral of contributions over the competing hypotheses. Section 5 provides concluding remarks.

2. Experimental design

The present study examines behavior in a 10-periods 3-players voluntary contribution mechanism in a partners design. In every period, each subject was given an endowment (50 experimental currency units) which could voluntarily be contributed toward a public good, or be kept to be consumed as a private good. The marginal per-capita return from the public good was one half. Under standard assumptions, thus, free-riding is predicted. Subjects' beliefs about the sum of contributions of their partners were incentive-compatibly elicited in each period.[2] Contributions and guesses (i.e., the elicited beliefs) were submitted simultaneously.

We considered two treatments in a between-subjects setting, information feedback being the treatment variable. In the information treatment (hereafter INFO), subjects received information feedback about the payoffs from the public goods game, broken up to the sum of partners' contributions, and from the guessing task after each period. In the control treatment (hereafter NoINFO), subjects received no information about payoffs and partners' contributions until the end of the experiment.

The experiment, conducted at the ESSE experimental laboratory of the University of Bari, was computerized by Fischbacher's (2007) z-Tree. In total 36 inexperienced subjects participated (i.e., 18 subjects per treatment) who earned on average 18,300 Lire ≈€9 ≈$10.[3] At the beginning, instructions were read and subjects went through four exercises.[4] The experiment did not start until subjects had answered all questions correctly. Thus, we are confident that the game and the incentives were understood.

3. Rationale and research hypotheses

Our experimental design simultaneously elicits contribution levels and beliefs about others' contributions. Hence, we are able to test whether contribution is a function of belief. Some theories in economics and psychology disregard a positive causal relationship between contributions and beliefs in the finitely repeated game. The most basic theory would suggest that contributions are mere random choices which may be influenced by errors (for some recent evidence on errors see Schmidt & Neugebauer, 2007). Though this suggestion seems rather unrealistic, it is an adequate benchmark hypothesis. However, also the standard maximization theories disregard the impact of contributions by others; rational players free ride on the contributions of the others,[5] and purely altruistic players who optimize efficiency contribute their entire endowment. Nevertheless, the existence of a positive relationship between beliefs and contributions is implied by theories of conditional cooperation (Croson, 2007) or strategic play (Kreps, Milgrom, Roberts, & Wilson, 1982). While the theory of conditional cooperation suggests that people contribute the more they expect others to contribute, the theory of strategic play proposes that people are opportunists who account for the possibility that others are conditional cooperators. Since conditional cooperators would react to free riders with decreasing their contributions, strategic players have incentives to cooperate too. Due to the different feedback scenarios in our experimental treatments, INFO and NoINFO, we are able to distinguish conditional cooperation from strategic play,[6] since in the NoINFO treatment a strategic player has no incentive to contribute anything. The 'false consensus' effect in psychology (Kelley & Stahelski, 1970) according to which people believe that others behave in the same way as they do would also predicts a positive relationship between beliefs and contributions. In comparison to the conditional cooperation theory, however, it would reverse the order of cause and action; a player would first choose her contribution and only then, based on her own action, form a belief about her partners' contributions. Whether beliefs or actions are first is only testable within our design if we make a

[2] Our scoring rule, which assumes symmetry of subjective distributions, induced payoffs equal to the square of 100 less the difference between the guess and partners' contribution divided by 400. Thus, payoffs were in the interval [0; 25].

[3] A session took 70 min.

[4] The translated instructions and exercises are provided in Appendix A.

[5] Rational players would interpret positive contributions as erroneous.

[6] The alternative 'strangers' setting where a similar declining pattern was observed in previous experimental research would eliminate strategic play to a good extent. However, since the dynamics in the partners setting are much more studied than those in the strangers setting, we decided to apply this experimental design.

Table 1
Relevant theories for contributions and guesses

Contribution	Guesses
Unrelated to beliefs • Random choice or errors • Free riding • Pure altruism	Unrelated to observed contributions • Virtual equilibrium learning • Rational expectations
Positively related to beliefs • Conditional cooperation • Strategic cooperation • False consensus effect	Positively related to observed contributions • Adaptive belief learning • Adaptive equilibrium learning

further assumption.[7] It seems reasonable to assume that observing the contributions of the others drives behavior in the conditional cooperation theory while we do not find any obvious reason for why observations should affect contributions in the false consensus theory. Under the assumption that the false consensus effect leaves contributions unaffected, we can test the impact of conditional cooperation against the impact of the false consensus effect in our data by simply comparing the contributions in both treatments. While a more general test of the order of contributions and beliefs within the same period is not possible in the experiment, the design enables us to study the sequential belief formation pattern of subjects between the periods of the repeated game. In particular, we investigate whether the guesses (which presumably stand proxy for the revealed beliefs) are a function of observed contributions of the others or whether they are unrelated. While the theory of rational expectations would suggest that guesses are not necessarily correlated to observations, beliefs are adapted according to observed choices in most learning theories. Equilibrium learning is one of the most relevant learning theories in the context of repeated public goods experiments. Although it may be easier to learn the free riding incentives by observing the contributions of others by imitation, 'virtual' equilibrium learning is even feasible in the conditions of the NoINFO treatment as people possibly think harder about the problem if they play it repeatedly. The argument is not far-fetched. 'Learning without feedback' has shown to be relevant in some contexts, like the guessing game (Weber, 2003) or first price sealed bid auctions (Neugebauer & Perote, 2008).

Table 1 records the outlined theories, based on which we next state several competing hypotheses on the reasons for the decline in the repeated public goods experiments. The first hypothesis for the contributions decline combines initial random choices (errors) and equilibrium learning with repetitions (Andreoni, 1988, 1995; Palfrey & Prisbey, 1997).

Hypothesis 1 -errors and adjustment by (virtual) equilibrium-learning-. First period contributions are uncorrelated to first period guesses about others' contributions (because people make errors) and contributions and guesses decline (because people learn the equilibrium with repetition) in INFO and in NoINFO (under the assumption of virtual equilibrium learning). Contributions in the NoINFO treatment exceed those in the INFO treatment if virtual equilibrium learning is slow.

The second hypothesis is based on the suggestion by Fischbacher et al. (2001) that the decline could be explained by conditional cooperation including a selfish bias, as contributions increase less than fully proportionally with those by others.[8] Adaptive belief learning on the basis of others' past contributions in combination with selfish-biased conditional cooperation produces a downward spiral of contributions.

Hypothesis 2 -selfish-biased conditional cooperation and adaptive belief learning-.[9] Contributions are positively correlated to guesses in both treatments and the guesses are adaptively formed on the basis of the observed contributions of the others. Contribution levels in the NoINFO treatment exceed those in the INFO treatment.[10]

Finally the third hypothesis is based on the claim of some researchers that the decline could be caused through strategic play in early stages and equilibrium learning (Selten & Stöcker, 1986; Andreoni, 1988; Sonnemans et al., 1999). In the NoINFO treatment, of course, strategic play is impossible.

Hypothesis 3 -strategic play-. Initial contributions in INFO exceed those of the NoINFO treatment, where subjects free ride on the others. Contributions in the INFO treatment decline because the potential return of cooperation from partners' future cooperation decline. Contribution levels in the NoINFO treatment are smaller than in the INFO treatment.

[7] Fischbacher and Gächter (2006) test for the false consensus effect through classification of the sample in different preference types. Given their classification, the false consensus effect would suggest that 'free riders' hold different beliefs than other preference types. Based on their data and classification they do not support a false consensus effect, since guesses are indistinguishable across preference types. In this paper we do not distinguish between types, since we are rather interested in the average behavior of experimental subjects. If we run a Spearman correlation coefficient test of first round contributions and guesses, the relationship between both turns out to be significantly positive ($p < 0.01$) in our two treatments; more cooperative subjects expect a higher contribution by the others, too. Thus, on the basis of this test, we cannot reject the false consensus for our data.

[8] In contrast to the one-shot strategy method ('cold') applied by Fischbacher et al. (2001), we study conditional cooperation with spontaneous decisions ('hot'). Experimental evidence on different behavior in hot and cold experiments was reported by Brosig, Weimann, and Yang (2003).

[9] Evidence for the Fischbacher et al. (2001) conjecture and thereby evidence for the selfish-biased conditional cooperation hypothesis has been found in independent.

[10] Note that the prediction of different contributions diverges from the false consensus hypothesis as formulated above.

4. Experimental results

Fig. 1 depicts the voluntary contributions and the guesses of the sum of partner's contributions in percentages of the endowment (left: NoINFO treatment; right: INFO treatment). The detailed data are recorded in the Appendix B. The main results follow, organized into five observations.

Observation 1. Initial contributions and guesses were the same in the INFO treatment and in the NoINFO treatment. Average contributions and guesses were significantly greater in the NoINFO treatment than in the INFO treatment.[11] Thus, the strategic play hypothesis and also the false consensus hypothesis must be rejected.

Support: In the NoINFO treatment, initial contributions and guesses average at 39.2% and 47.3% of the endowment and overall periods contributions are 41.4 % and guesses are 51.0% of the endowment. In the INFO treatment average contributions are initially at 35.2% and overall at 24.4% while average guesses are initially at 43.3% and overall at 32.6% of the endowment. The average contributions and guesses between the two treatments are significantly different (at least at the ten percent level); the *p*-value of equal average contributions [equal guesses] in both treatments is 0.045 [0.096]. These are the results of the two-tailed Mann-Whitney test involving $N_{\text{NoINFO}} = 18$ and $N_{\text{INFO}} = 6$.[12]

Observation 2. Contributions are correlated to guesses in each period and correlation coefficients do not change over periods in each treatment. The contributions and guesses are positively correlated also on the individual level. Thus, the random-choice (errors) hypothesis must be rejected.

Support: The Spearman rank correlation coefficients of initial contributions and initial guesses are 0.59 in the NoINFO treatment and 0.80 in the INFO treatment. The probability that such strong correlations or even stronger ones occur by chance are 0.005 and 0.000, respectively. The contributions and guesses are significantly correlated (at least at the ten percent level) in each period for each treatment.[13] There is no trend in the correlation coefficients; the pooled regression of the correlation coefficients on periods reveals that the slope is not significantly different from zero as the *p*-values are 0.149 in the NoINFO treatment and 0.663 in the INFO treatment. Moreover, the individual contributions and guesses reveal positive Spearman rank correlation for 13 out of 18 subjects in NoINFO and for all subjects in the INFO treatment. According to the binomial test, the probability that such an extreme event or an extremer one occurs by chance is 0.041 and 0.000, respectively.

We next study the trends of contributions and guesses in the experimental treatments with the two models A and C as recorded in Table 2. The apostrophe indicates the estimations for the INFO treatment. The reported models account for the panel structure of the data under the random effects assumption involving $N = 6$ (model A) or $N = 18$ (models C, A′, C′) independent observations and $T = 10$ periods.[14] The dependent variables, subject *i*'s contribution and her guess of the partners' contributions in period *t*, are denoted by $cont_{it}$ and $guess_{it}$. The independent variable for these regressions is the time trend, i.e., period *t*. From the outcomes of the regressions we draw the following conclusion.

Observation 3. While contributions and guesses decline when feedback about the partners' contributions is given (INFO), contributions and guesses do not decline when no feedback is given (NoINFO).[15] Thus, based on our data, the virtual-equilibrium-learning hypothesis must be rejected.

Support: The result follows from the time coefficients and standard errors as recorded in Table 2. We stratified the panel data by the independent observation; the model A was estimated on the basis of the average contributions in the INFO treatment (i.e., $N = 6$), and the regressions C, A′ and C′ were run on the individual choices (i.e., $N = 18$) over the ten periods.

In our report, so far only the conditional-cooperation-adaptive-learning hypothesis has not received any rejection by the data. We next proceed with a more in-depth-analysis of the choice determinants in the experiment to test this hypothesis. For this purpose we estimate the following Eqs. (1) and (2) (represented as models B and D in Table 2) which capture the panel data dynamics for both contributions and guesses.

$$\text{Cont}_{it} = \alpha_0 + \alpha_1 \text{Cont}_{it-1} + \alpha_2 \text{Guess}_{it} + \alpha_3 \,\text{Av. Cont}_{-it-1} + \eta_{1i} + \varepsilon_{1it} \quad (1)$$

$$\text{Guess}_{it} = \beta_0 + \beta_1 \text{Guess}_{it-1} + \beta_2 \,\text{Av. Cont}_{-it-1} + \eta_{2i} + \varepsilon_{2it} \quad (2)$$

In Eqs. (1) and (2), the random effects terms of each equation (η_{1i} and η_{2i}) are supposed to be independent and identically distributed over the individuals and independent to the equations disturbances (ε_{1it} and ε_{2it}) for each *i* and over all *t*. The Eq. (1) explains subjects' contributions in terms of their own past contributions, their guesses about others' con-

[11] Croson (2000) reported similar contributions in a treatment comparable to INFO.

[12] The first period contributions and guesses are not significantly different; the *p*-values of the Mann-Whitney test on the null-hypothesis of equal contributions [equal guesses] is 0.119 [0.678], $N_{\text{NoINFO}} = N_{\text{INFO}} = 18$.

[13] The test is run on the individual level, $N = 18$, since the guesses were private information. However, similar results are obtained for the group averages in the INFO treatment.

[14] We use the random effects model as applied in Croson et al. (2005) and Croson (2007) and according to the Hausman test.

[15] The observation of no significant decline confirms Sell and Wilson (1991) who studied a public goods experiment with no feedback on partner's contributions without expectation elicitation.

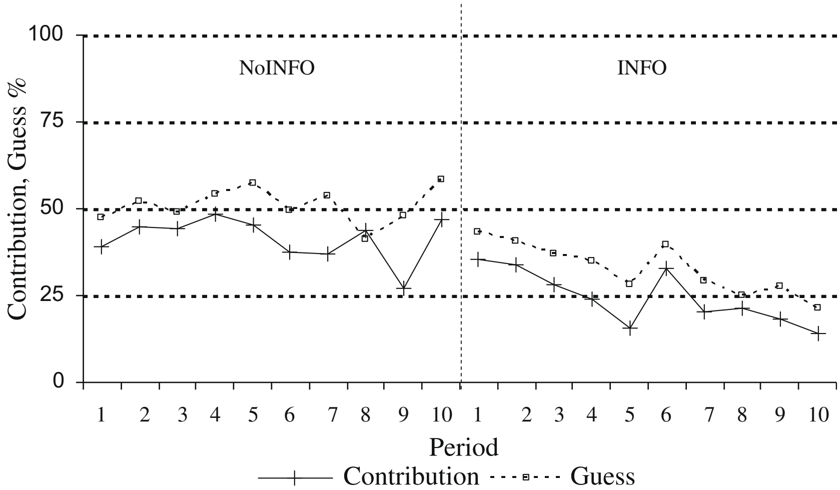

Fig. 1. Contributions and guesses relative to endowment.

tributions and the lagged average contribution of the other two group members (denoted by $-i$).[16] The Eq. (2) models subjects' guesses as a function of their lagged guesses and their partners' contributions. The two models are estimated by the generalized method of moments (GMM) to ensure the consistency of the parameter estimates of the corresponding dynamic panel data structures.[17] In particular, we used the Arellano-Bond estimator implemented in the STATA software package. The results, as recorded in Table 2,[18] support the following observation which is in line with the conditional-cooperation-adaptive-learning hypothesis.

Observation 4. In both treatments, contributions depend significantly on guesses. In the INFO treatment, guesses depend significantly on the lagged partners' contributions supporting the adaptive-learning-hypothesis.

Support: see Observation 2 and Table 2.[19] The regressions were run on the individual choices stratified by subject (i.e., $N \times (T - 1) = 18 \times 9$ observations per treatment).

As pointed out above, Fischbacher et al. (2001) observed a selfish bias in conditional cooperation when they studied the one-shot game with the strategy method. Our data reveal a similar pattern of spontaneous decisions in the repeated game.

Observation 5. Subjects' guesses exceed their own contributions and also exceed, on average, the contributions of the others. The difference between guesses and others' contributions does not decline over time. Hence, the hypotheses of errors-equilibrium learning (in beliefs) and unbiased or rational expectations must be rejected.

Support: In each treatment, the average contributions of three subjects (i.e., 16.7%) exceed their guessed average contribution levels of the others, the others (but one subject who expects the same from the others) contribute less than they expect from the others. According to the two-tailed Wilcoxon signed ranks test, the exact likelihood that such an extreme event or an even extremer one occurs by chance is 0.003 in each treatment. The individual contributions average 8.3% (INFO) and 9.6% of the endowment (NoINFO) below the individuals' guesses (see also Fig. 1), and so do the differences between guesses and others' contributions. The difference between guesses and others' contributions is the same in both treatments (the p-value of equal differences is 0.770). A random effects regression analysis shows that these differences do not significantly decrease as the coefficients of the slopes are insignificant (the corresponding p-values are 0.228 (NoINFO) and 0.717 (INFO)).

[16] In the NoINFO treatment, instead of the contributions of the actual other two group members we use the average contributions of the other seventeen participants throughout the paper.

[17] Note that dynamic panel data models (i.e. containing lags of the dependent variables as regressors) can not consistently be estimated by the standard random or fixed effects models. We use the one-step least squares approach which employs the lagged variables as instruments (see Arellano & Bond, 1991).

[18] The Sargan test of over-identifying restrictions and the m_1 and m_2 statistics are also included in Table 2 to check the validity of the instruments and the first and second order autocorrelation in the differenced residuals, respectively. These tests confirm the validity of the instruments and the absence of misspecified dynamic structures.

[19] It is noteworthy that no correlation for guesses can be identified in the estimation results for the NoINFO treatment. Without observing the others' contributions, the aggregate belief formation procedure is apparently not different from noise. In contrast to the NoINFO treatment, the information divulged in the INFO treatment seems to make the belief formation process less heterogeneous.

Table 2
Panel data regression models

Model	NoINFO				INFO			
	$Cont_{it}$		$Guess_{it}$		$Cont_{it}$		$Guess_{it}$	
	A	B	C	D	A′	B′	C′	D′
Intercept	22.404** (2.829)	−0.631 (0.379)	50.237** (5.153)	−0.277 (0.671)	17.674** (2.931)	−0.210 (0.286)	44.459** (6.174)	−1.457* (0.581)
Period t	−0.311 (0.263)		0.143 (0.462)		−0.995** (0.295)		−2.149** (0.488)	
$Guess_{it}$		0.100* (0.051)				0.336** (0.046)		
$Cont_{i,t-1}$		−0.044 (0.100)				0.227** (0.084)		
$Guess_{i,t-1}$				−0.061 (0.102)				0.038 (0.101)
Av. $Cont_{-i,t-1}$		−0.206 (0.316)		−0.320 (0.558)		−0.057 (0.107)		0.572** (0.218)
Sargan test		59.76 [0.006]		35.94 [0.424]		37.01 [0.376]		39.49 [0.276]
m_1		−6.59 [0.000]		−6.65 [0.000]		−5.68 [0.000]		−6.04 [0.000]
m_2		−0.50 [0.621]		−2.44 [0.015]		1.52 [0.129]		0.17 [0.864]

**$p < 0.01$, *$p < 0.05$; standard errors are in parenthesis and p-values in brackets.

5. Concluding remarks

The present paper contributes to the resolution of the declining-contributions puzzle in repeated public goods experiments. Due to the experimental design, we were able to test several hypotheses regarding the formation of beliefs and the relation between contributions and beliefs. Our data show that beliefs are adapted according to past observations, and contributions are highly significantly correlated to beliefs. Therefore we can reject the hypothesis that subjects' contributions are random or due to errors (see Observation 2). If contributions were due to errors as has been brought to mind in the literature (see Andreoni, 1988, 1995; Palfrey & Prisbey, 1997) then, according to our data, the errors must be in the beliefs. We found evidence that subjects' beliefs are biased in a self-serving way; subjects overoptimistically believe that the others contribute more then themselves. This error in beliefs does not decrease or disappear in the repeated game. At least with respect to belief learning, thus, we must reject the adaptive-equilibrium-learning hypothesis on the basis of our data (for an overview of learning models see Camerer, 2003). Strategic play as the driving force behind the decay of contributions in the experiment (Andreoni, 1988; Sonnemans et al., 1999) must also be rejected, since contributions were greater in our benchmark treatment (NoINFO) in which strategic play was impossible.

The only viable hypothesis according to our data is the one of conditional cooperation and adaptive belief learning. As a matter of fact, adaptive learning was incomplete as the error in beliefs did not seize. Our result that individual contributions were smaller than the believed contributions of the others encourage the statement of Fischbacher et al. (2001) that subjects do not want to contribute more to the public good than their partners. In other words (see Isaac, Schmidtz, & Walker, 1989), although subjects do not free ride, they apparently try to 'cheap ride' on the others. Based on our data we may conclude that the contributions appear to 'spiral downwards' in the repeated setting with feedback information due to selfish-biased conditional contribution and downward adaptation of beliefs which, compared to contributions, are overoptimistic. Without the persisting overoptimism in the belief formation the decline of contributions would probably be steeper.

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Appendix A. *A.1. Instructions (translated from Italian)*

(1) You are about to participate in 10 Periods of a Group Decision-Making Experiment, in which you will interact with (always the same) two partners, whose identity will not be revealed to you at any time.
(2) In every Period you (as well as your partners) will receive an initial endowment of 50 ECU (1 ECU = 25 Lire), and you have to decide how much of this amount to contribute to a Group Project and a remainder to an Individual Project. Any ECU contributed to the Group Project will generate Payoff for you as well as for each of your partners. The remainder of your endowment that you do not contribute to the Group Project will be saved in your Individual Project, which generates payoff only to you.

(3) Your PAYOFF FROM THE GROUP DECISION in a Period will be determined as follows:

$0.5 \times$ Group Project $+$ your Individual Project.

(4) During the entire experiment you will not receive any information about the other group members' contribution to the Group Project.

(5) However, you will be asked to guess the sum of the partners' contribution. In each Period you have to enter your Guess about this sum, i.e., a number between 0 and 100. Your PAYOFF FROM GUESSING will be determined as follows (in ECU):

$$\frac{1}{400}(100 - |\text{your guess} - \text{the actual sum of the contributions of your partners}|)^2$$

Note: the closer your Guess is to the sum of contributions of your partners the higher is your payoff. To calculate proceed as follows:

Calculate first the difference between your Guess and the sum of your partners' contributions. If this sum is

1. Positive calculate the difference between 100 and this result.
2. Negative calculate the sum between 100 and this result.

Then calculate the square of this difference and divide it by 400.

At the end of the experiment you will be told and paid the sum of payoffs (converted into Lire) you received during the experiment. This includes the payoffs from the Group Decision as well as from Guessing.

A.2. Exercises (translated from Italian)

Exercise 1:

(a) How much Payoff does every group member receive from the Group Decision in a Period in which none of them contributes anything to the Group Project?

(b) How much Payoff does a group member receive if she or he submits a guess of 0, 50 or 100?

Exercise 2:

(a) How much Payoff does every group member receive from the Group Decision in a Period in which every member contributes the entire endowment (50 ECU) to the Group Project?

(b) How much Payoff does a group member receive if she or he submits a guess of 0, 50 or 100?

Exercise 3:

(a) How much Payoff does every group member receive from the Group Decision in a Period in which the lowest contribution to the Group Project is 0 ECU, the median-contribution is 25 ECU and the highest-contribution is 50 ECU?

Exercise 4:

(a) How much Payoff does every group member receive from the Group Decision in a Period in which the lowest contribution to the Group Project is 0, the median contribution is 1 ECU and the highest contribution is 2 ECU?

Please make your calculation on this sheet. (Hint: calculate first the Group Project, than the Individual Project for each member. Next calculate the absolute value of the difference between your Guess and the sum of the others' contribution).

Appendix B

(See Appendix Table B1).

Table B1
Individual guesses and contributions (in percentage of endowment)

ID	Period NoINFO										Period INFO									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
GUESS1	45	40	65	45	80	50	45	50	35	75	10	40	30	20	30	0	30	40	45	20
CONT1	40	40	60	80	80	20	50	40	20	80	20	40	30	10	20	24	30	20	40	20
GUESS2	30	30	50	40	60	35	45	65	70	50	30	20	35	50	20	15	25	40	48	49
CONT2	30	10	30	20	40	30	20	60	40	50	20	16	20	30	14	16	20	30	24	24
GUESS3	80	80	85	60	75	85	85	80	60	85	50	40	30	20	10	100	50	40	30	20
CONT3	30	40	70	40	50	56	56	36	20	48	50	40	30	20	10	100	100	80	60	40
GUESS4	20	20	20	20	20	20	20	20	20	20	30	45	60	80	85	45	50	35	55	35
CONT4	20	20	20	20	20	20	20	20	20	20	50	60	100	80	40	20	20	40	10	10
GUESS5	65	80	75	85	65	95	75	80	86	69	20	30	28	40	10	29	38	20	40	20
CONT5	60	70	40	70	60	70	80	70	86	60	10	20	0	40	0	30	10	10	0	20
GUESS6	50	80	50	25	50	50	50	50	50	50	75	75	75	100	50	90	30	75	75	40
CONT6	50	50	50	100	50	50	50	50	50	50	50	50	100	100	60	60	20	80	50	20
GUESS7	43	60	39	80	38	59	68	0	80	96	75	60	50	65	80	100	75	60	28	28
CONT7	46	98	70	60	68	52	100	94	68	30	50	30	20	40	60	100	50	30	0	0
GUESS8	50	75	80	70	50	40	35	20	25	20	30	75	35	28	60	55	50	35	55	20
CONT8	0	60	60	30	20	0	10	0	20	20	10	84	16	4	20	70	40	60	30	0
GUESS9	50	70	25	50	80	40	100	30	20	50	50	50	50	50	29	33	50	35	35	30
CONT9	40	0	20	0	14	10	0	20	12	16	50	50	50	0	14	20	40	20	22	20
GUESS10	50	45	55	100	75	50	50	40	40	50	20	40	40	15	20	0	0	0	0	0
CONT10	50	50	30	100	70	20	30	20	20	50	4	0	0	0	0	0	0	0	0	0
GUESS11	50	15	45	62	40	29	56	10	30	60	100	50	25	19	25	25	25	25	23	0
CONT11	40	30	46	26	52	60	44	30	10	6	100	50	0	0	0	0	0	0	0	0
GUESS12	60	75	40	80	75	50	65	57	80	78	50	50	25	25	0	50	0	0	0	0
CONT12	60	80	70	40	0	66	50	80	68	40	50	50	40	50	0	50	0	0	0	0
GUESS13	50	60	50	0	100	80	10	50	100	100	20	20	16	30	25	25	10	0	31	3
CONT13	60	60	80	50	100	80	20	100	0	64	20	20	16	30	26	24	2	0	2	2
GUESS14	50	40	50	60	20	30	50	20	25	50	45	30	30	20	18	18	18	15	10	8
CONT14	20	40	20	30	40	60	0	0	10	100	40	20	40	2	10	6	0	10	10	8
GUESS15	95	80	80	94	89	88	91	66	94	75	45	35	25	35	25	20	20	15	13	6
CONT15	96	80	60	96	96	70	100	90	24	90	10	10	20	10	10	10	0	0	0	0
GUESS16	4	3	10	7	17	12	20	9	2	3	60	40	25	17	7	50	5	7	3	25
CONT16	4	2	8	6	0	8	8	4	0	6	40	50	4	6	0	40	2	6	0	20
GUESS17	40	50	20	60	45	30	50	40	20	80	60	30	28	10	5	5	30	5	5	30
CONT17	30	50	20	60	40	0	10	40	0	60	60	20	24	10	0	20	30	0	40	20
GUESS18	20	30	40	40	50	50	50	55	30	35	12	0	60	0	5	50	20	5	0	50
CONT18	30	30	40	40	20	0	20	30	20	50	0	0	0	0	0	0	0	0	40	50

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