Online Appendix for Communication in Multilateral Bargaining with Joint Production

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1 Proofs

1.1 Proof of Corollary 1

Proof. From Herings et al. (2018) we know that the continuation values of the game are bounded from below by $\underline{v} = \frac{3-3\delta}{9-6\delta-\delta^2}$ and bounded from above by $\overline{v} = \frac{3-\delta}{9-6\delta-\delta^2}$. Thus, out of equilibrium if play were to reach round 5, shares offered to voters by the proposer must be in $H^5 = (0.261, 0.435)$. Using these bounds, we can backward induct, to estimate the continuation payoffs from above and from below to construct H^4.

The backward step is based on the following reasoning. Consider round 4. To construct the lower bound on continuation values, note that in this round, a proposer can guarantee to get at least $1 - 0.435 = 0.565$, and a responder can only guarantee 0. This gives the lower bound of $(1/3) * 0.565 + (2/3) * (0) = 0.188$. A proposer cannot get more than $1 - 0.261$, and a responder will never be offered more than 0.435. Thus, $(1/3) * (1 - 0.261) + (2/3) * (4.35) = 0.536$ which gives the upper bound for continuation values in round 4. Hence we have the set of continuation values that can be sustained as an SPE in round 4 to be $H^4 = (0.188, 0.536)$. One can continue working backwards and the bounds expand with each step. Thus, prior to any proposer being selected in round 1, the set of admissible shares as part of an SPE becomes $H = (0.08, 0.806)$.

1.2 Proof of Part 1 of Lemma 2

Proof. We show first that there exists an SPE strategy that sustains full efficiency and equal sharing as the outcome of the game. First, we consider the set $C^{Proportional} := \{(c_1, c_2, c_3)\, s.t.\, s_i = 1.8c_i \in H\, \forall i\}$ and C^{MWC} as its complement. Consider the following equilibrium proposals: (1) $s_i = 1.8c_i$ if and only if $(c_1, c_2, c_3) \in C^{Proportional}$ and (2) $\mathbf{s} = (F/2, F/2, 0)$ where the proposer offers $= F/2$ to the highest contributing voter (breaks ties randomly). Note that in both cases the shares offered are within the bounds of the SPE set. We must now show that deviating from full contributions is unprofitable. There are two cases. If the deviation is small enough, then players are in the proportional equilibrium sharing where they receive a proportionally smaller share. It is clear that it does not pay to deviate since decreasing contributions by 1 unit results in a fall of 1.8 units from the share received. If the deviation is large enough such that proportional sharing is not supported by an SPE (i.e. $(c_1, c_2, c_3) \in C^{MWC}$), then, a deviating player is never invited to the coalition when others propose and only secures F/2 when she proposes (which happens with 1/3 chance). For the case of the most extreme deviation (contributing 0), this results in expected earnings of 80, which are lower than the payoffs from full contribution (90).

1.3 Proof of Part 2 of Lemma 2

Proof. Consider the division $\mathbf{s} = (F/2, F/2, 0)$ where the proposer offers $= F/2$ to the lowest contributing voter (breaks ties randomly). We show that $c_i = 0$ is the only equilibrium.

We start by showing that no player would like to deviate unilaterally from $\boldsymbol{c} = (0, 0, 0)$. In such scenario, every player earns 50 (endowment). Suppose player i invests $c_i > 0$. Then, the total fund is $F = 1.8 \cdot c_i$. With 1/3 chance she is the proposer and receives $0.5 \cdot F$ and with 2/3 chance she is a non-proposer and is never invited to the coalition. Her expected payoffs are $50 - c_i + \frac{1}{3} \cdot \frac{1}{2} \cdot (1.8c_i) + \frac{2}{3}0$. This equals $50 - 0.7c_i < 50$ for all c_i. Thus, it does not pay to deviate.

Let $\boldsymbol{c} = (c_1, c_2, c_3) \geq (0, 0, 0)$ be a symmetric contribution vector, $c_1 = c_2 = c_3 = c$. The expected payoff is $1.8c + 50 - c = 50 + 0.8c$ because all players are equally likely to form the MWC and split in half the surplus. A player reducing her investment by 1 unit to $c - 1$ is invited to the coalition with probability 1, thus always sharing in half of the total fund. This leads to earning $50 - (c - 1) + \frac{1.8(3c-1)}{2}$. It straightforward to verify that it pays to undercut.

For an asymmetric vector of contributions, one can easily note that the highest contributing member is always better off by reducing her investment because she is never included in the coalition when the other members are proposing. Thus, she is able to receive half of the fund for 1/3 of the times (when she proposes). In expectation, the costs of contribution outweigh the expected return.

2 Supporting Tables and Figures

Table 1: Average Investments by Treatment

Treatment	Mean	Session Means
NC-NO	15.2	17.4 - 10.9 - 21.3 - 12
C-NO	25	33.5 -30.7 -15.2 - 26.1 - 21.9- 25.9
NC-O	28.9	28.4 - 29.8 - 27.6 -29.8
C-O	30.8	12.1 -29.2 -42.1 - 43.6 - 17.1 - 35.8

Figure 1: Evolution of Investments, by Treatments at the Session Level

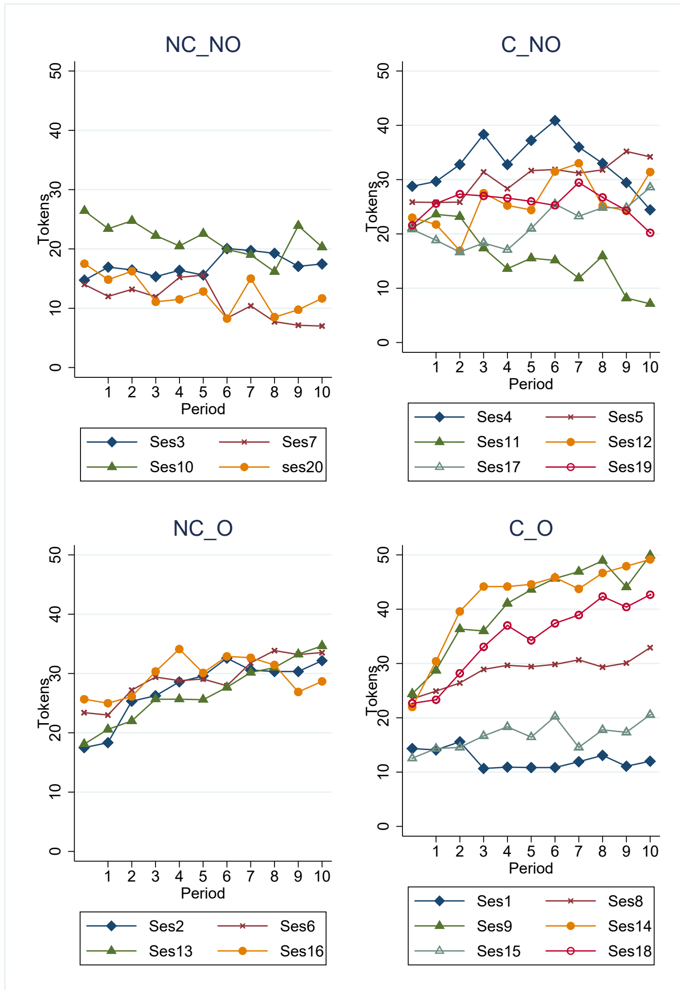

Table 2: OLS Regressions for Investments

	(1) NC-NO	(2) C-NO	(3) NC-O	(4) C-O
Period	-0.35*	0.07	1.03***	1.10***
	(0.194)	(0.248)	(0.230)	(0.190)
Constant	19.37***	33.08***	22.76***	6.07***
	(3.564)	(2.437)	(1.940)	(2.025)
N	540	780	480	720
R^2	0.10	0.13	0.06	0.54
F-statistic	4.45	5.15	5.67	64.23

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at subject level reported in parentheses below coefficient values. Session fixed effects included but not shown.

Table 3: Bargaining Outcomes with Stronger Inclusion Criteria

	SSPE	Unobservable		Observable	
	Prediction	No Chat	Chat	No Chat	Chat
Minimum Share > 1					
2-way Splits (MWC)	100%	11.11	26.74	20.63	9.58
3-way Splits	0%	86.67	72.87	79.38	90.42
Minimum Share > 5					
2-way Splits (MWC)	100%	17.22	29.84	26.88	12.92
3-way Splits	0%	78.33	68.60	73.13	86.25

Here we require each a group member to receive a share strictly greater than 1 or 5 tokens to be considered included in the coalition.

Table 4: Percentage of allocations and shares falling between the proportionality and equality benchmarks.

	NC-NO	C-NO	NC-O	C-O
Allocations	8.0	19.0	18.5	45.8
Shares				
Proposer	33.8	43.3	32.8	59.8
Voters	40.6	46.8	37.0	64.7

3 Chat Content and Impact on Bargaining

3.1 Examples of Chat Coding Categories.

The following conversations are edited for grammatical mistakes.

Example 1: Proportionality expressed by a voter. [Observable Investments, Session 1, Group 2, Period 2, Round 1]

Voter:	I think since you didn't contribute that much, it would be fair if me and 3 got more

Example 2: Proportionality implied by the Proposer. [Unobservable Investments, Session 4, Group 2, Period 2, Round 1] In this example the proposer and voter are truthfully reporting their investments.

Voter:	I contributed 50 to the fund, for maximum return
Proposer:	good idea thank you
Voter:	it looks like 35 was contributed by yourself or between you and subject 2
Proposer:	ok thanks for the info - will distribute fairly. I did 15
Voter:	I'm not greedy so a 1.8 return is 90, is that acceptable?
Proposer:	yes

Example 3: Equality and Proportionality. [Unobservable Investments, Session 5, Group 3, Period 3, Round 1]. The proposer argues for an equal split, while the voter is coded as arguing for proportionality.

Proposer:	I want to split evenly. How much did you contribute?
Voter:	if we split evenly we gotta contribute evenly right? that makes sense
Proposer:	no
Voter:	last time I threw up the most and got the least profit compared. why should we split evenly if everyone contributes different amounts. that seems very....marxist like

Example 4: Proposer expresses desire to form a Minimum Winning Coalition. [Observable Investments. Session 9, Group 3, Period 4, Round 1]

Proposer:	want to split it evenly and screw the other person over
Voter:	Nah.. not worth my soul
Proposer:	you right lol

In table 5, we present a summary of the coding categories, agreement rates, and Cohen's Kappa.

Table 5: Coding Categories Summary

Category	Agreement	Cohen's Kappa	#Obs by Coder 1	#Obs by Coder 2	Total Possible [1]
Proportional	90.84%	0.61	245	291	1964
MWC	96.59%	0.78	151	186	1964
Equality	94.81%	0.77	233	277	1964
Compete	99.34%	0.13	9	6	1964
Desired Share	90.94%	0.52	272	150	1964
Stated Contribution	97.20%	0.94	521	509	1072
Lying Detection	98.3%	0.76	37	41	1072
Punishment	97.06%	0.74	5	3	68

[1] We exclude all empty chat screens (5%). For each bargaining round, coders saw both chat screens: one for each voter with the proposer. Since each category can be coded separately for each sender (proposer or voter) in each chat screen, there are 4 possible times per bargaining round in which a coder could mark the different categories. The punishment category is only analyzed for proposals in round 2.

In the body of the article we have conducted our analysis on communication content by assigning a chat category to a given bargaining round if at least one coder recorded it as such. Table 6 reproduces Table 4 in the body of the paper accounting for the more demanding case where both coders must agree.

Table 6: Estimation results for the impact of communication on bargaining outcomes when both coders agree.

	Dependent Variables	
	(1)	(2)
	Fairness	All Members Retrieve Investment
(β_0) Constant	0.70***	0.29
	(0.049)	(0.208)
(β_1) Observable	0.18***	1.12***
	(0.052)	(0.258)
Proposer Messages		
(β_2) Proportional	0.24***	0.43**
	(0.054)	(0.205)
(β_3) Observable × Proportional	-0.18***	
	(0.055)	
(β_4) MWC	-0.20***	-1.79***
	(0.059)	(0.532)
(β_5) Observable × MWC	-0.08	-0.47
	(0.080)	(0.632)
Voter Messages		
(β_6) Proportional	0.15***	1.05***
	(0.041)	(0.314)
(β_7) Observable × Proportional	-0.15***	-0.91**
	(0.042)	(0.376)
(β_8) MWC	-0.17***	-1.03***
	(0.040)	(0.223)
(β_9) Observable × MWC	0.11**	0.16
	(0.044)	(0.296)
Num. Obs.	519	498 [1]
F-statistic	13.65	
χ^2		295.90

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at session level reported in parentheses below coefficient values.

[1] 21 observations where dropped because of collinearity since the proposer calling for a proportional allocation leads to all members retrieving their investment in every case in Treatment C-O.

Table 7: Estimation results for the impact of communication including calls for equality on bargaining outcomes.

	Dependent Variables	
	(1)	(2)
	Fairness	All Members Retrieve Investment
Constant	0.703***	0.235
	(0.0591)	(0.259)
Observable	0.200**	1.637***
	(0.0601)	(0.317)
Proposer Messages		
Proportional	0.107	0.527**
	(0.0500)	(0.195)
Observable × Proportional	-0.0824	-0.370
	(0.0572)	(0.353)
MWC	-0.197**	-1.200***
	(0.0479)	(0.223)
Observable × MWC	-0.0543	-0.919**
	(0.0714)	(0.295)
Equality	-0.0191	0.00707
	(0.0237)	(0.137)
Observable × Equality	-0.0213	-0.0474
	(0.0617)	(0.519)
Voter Messages		
Proportional	0.125*	0.586***
	(0.0502)	(0.153)
Observable × Proportional	-0.151*	-0.678***
	(0.0539)	(0.203)
MWC	-0.130**	-0.819***
	(0.0306)	(0.203)
Observable × MWC	0.0558	-0.354
	(0.0361)	(0.253)
Equality	-0.0177	0.136
	(0.0208)	(0.145)
Observable × Equality	0.0574	-0.374
	(0.0399)	(0.402)
Num Obs.	519	519

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at session level reported in parentheses below coefficient values. A given round of communication is coded as proportional, MWC, or equality only if at least one coder marks it as such.

Table 7, investigates how calls for equality in the communication stage can affect proposals. In Table 4 of the body, we omitted this category.

In Table 8 we include the two cases in which subjects reached round 3 and re estimate Table 4 in the body of the article. By mistake, our original coders did not code these conversations, thus Table 4 in the article is only for rounds 1 and 2. We hired a third coder to fill in this missing data. As is clear, there are no meaningful changes in the estimation results.

At the suggestion of an anonymous referee, we hired an additional research assistant to code the chat for some additional categories. We report frequencies of these additional categories in Table 9. The first category indicates discussions of previous periods of play (as distinct from previous bargaining rounds within the same period of play). Similarly, the second category indicates discussions of future periods of play. As matching across periods is randomized, there is limited room for relevant discussion of previous and future periods, but nonetheless it does occur sometimes. The third new category indicates a friendly tone of conversation, such as joking.

Table 10 shows regression results on the correlation between friendly conversation and the proportion of the group fund allocated to an individual voter. The independent variables are the voter's own investment as a proportion of the total investment, an indicator for friendly conversation between the voter and the proposer, Observability, and interactions between Observability and the other independent variables. The Friendly indicator equals one if both the proposer and the voter in a particular conversation were coded as friendly.[1] Friendly chat correlates with a higher share to the voter. However, this correlation is somewhat weaker in the Observable treatment. One possible interpretation might be that friendly chat in the Unobservable condition indicates trust between the proposer and voter about reported investment. Alternatively, the friendliness may matter less in the Observable treatment because the individual investments give the proposer a stronger basis for allocating shares.

[1] If instead an indicator for either the proposer or the voter being coded as friendly is used, the results are very similar.

Table 8: Estimation results for the impact of communication on bargaining outcomes (Including Round 3 Proposals)

	Dependent Variables	
	(1)	(2)
	Fairness	All Members Retrieve Investment
(β_0) Constant	0.69***	0.29
	(0.056)	(0.216)
(β_1) Observable	0.21***	1.51***
	(0.058)	(0.283)
Proposer Messages		
(β_2) Proportional	0.11**	0.52***
	(0.049)	(0.192)
(β_3) Observable × Proportional	-0.09	-0.35
	(0.056)	(0.341)
(β_4) MWC	-0.19***	-1.20***
	(0.047)	(0.216)
(β_5) Observable × MWC	-0.05	-0.95***
	(0.069)	(0.266)
Voter Messages		
(β_6) Proportional	0.13**	0.56***
	(0.052)	(0.160)
(β_7) Observable × Proportional	-0.15**	-0.66***
	(0.056)	(0.225)
(β_8) MWC	-0.13***	-0.82***
	(0.030)	(0.194)
(β_9) Observable × MWC	0.05	-0.34
	(0.037)	(0.268)
Num. Obs.	519	519
F-statistic	49.65	
χ^2		1858.49

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at session level reported in parentheses below coefficient values.

Table 9: Percentage of Bargaining Rounds Coded for Additional Communication Categories.[1]

	Unobservable	**Observable**
Past		
Proposer	0.7	0.7
Voter	2.7	3.9
Future		
Proposer	1.3	0.0
Voter	0.9	1.5
Friendly		
Proposer	3.1	4.9
Voter	6.0	5.4

[1] We exclude all empty chat screens. Approximately 2% of all non-empty chat screens were marked as irrelevant by coders.

Table 10: Regression results on friendly conversation and proportion of the group fund allocated to an individual voter.

	Own Proportion Share
(β_0) Constant	0.26***
	(0.021)
(β_1) Observable	-0.10**
	(0.038)
(β_2) Own Proportion of Investment	0.09
	(0.074)
(β_3) Observable × Own Proportion of Investment	0.38***
	(0.121)
(β_4) Friendly	0.11***
	(0.020)
(β_5) Observable × Friendly	-0.07*
	(0.035)
Num. Obs.	1038
F-statistic	41.25

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at session level reported in parentheses below coefficient values.

Table 11: Probability of Voters Exaggerating Investment, Not Reporting, or Truthfully Reporting.

Exaggerate Investment in Report	
Investment	-0.08***
	(0.010)
Constant	2.29***
	(0.432)
Not Report Investment	
Investment	-0.04***
	(0.008)
Constant	1.29***
	(0.398)
Num. Obs.	537
χ^2	186.50

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors reported in parentheses below coefficient values. Session fixed effects included but not shown.

4 Dynamic Analysis of Investments

In this section we investigate how experience throughout the experimental session affects subjects' affects subjects' decision to invest. To do so, we focus on two key variables that shape subjects' experiences: (1) lagged returns to investment, defined as the difference between the amount invested and the share received in the previous game and (2) the lagged fairness index of the agreed split. Note that in all treatments, once an agreement is reached, feedback is displayed revealing each member's investment and share. Thus, the inter-period information is identical across treatments. This is important to highlight because investments are unobservable in NC-NO and C-NO, but once an agreement is reached, they are made public.

We estimate a simple reinforcement learning model with one a period lag. It is natural to conjecture that experiencing positive returns in a previous agreement as well as high levels of fairness (i.e. proportionality) may encourage higher investments. Specifically, we estimate $\Delta\text{Investment}_{i,t} = \beta_0 + \beta_1(\text{Share}_{i,t-1} - \text{Investment}_{i,t-1} + \beta_2\text{Fairness Index}_{i,t-1} + \beta_3\text{Period} + \epsilon_{i,t}$ where $\Delta\text{Investment}_{i,t} = \text{Investment}_{i,t} - \text{Investment}_{i,t-1}$. The fairness index is defined as the Euclidean distance between the agreement and proportional split (relative to investments, see main text). The estimation results are displayed in Table 12.

The estimation results reveal a positive correlation between the change in investments and Fairness in all treatments with the exception of NC-NO. This means that Fairness is a key driver of investments in treatments in which subject can enact proportional redistribution. Recall that messages about invested amounts are largely truthful in C-NO, and so are calls for proportionality. Interestingly, lagged returns impact investment behavior only in the absence of investment observability (NC-NO and C-NO).

Table 12: OLS Regression for Change in Investments from one Period to the Next

	(1) NC-NO	(2) C-NO	(3) NC-O	(4) C-O
Fairness of Previous Agreement	-0.316	6.507***	6.684*	6.294**
	(2.164)	(1.813)	(2.504)	(2.204)
Lagged Return (Share-Investment)	0.156**	0.0416*	-0.0329	-0.0236
	(0.0491)	(0.0184)	(0.0222)	(0.0286)
Constant	-1.016	-5.877**	-1.366	-0.734
	(1.908)	(2.044)	(2.979)	(2.121)
N	486	696	432	648
R^2	0.0681	0.0424	0.0362	0.0382
F-statistic	1.582	3.442	1.817	1.957

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at subject level reported in parentheses below coefficient values. Period effects included but not shown.

5 Subject-Level Analysis of Consistency in Proposals

In this section we explore whether subjects are consistent in the type of proposals they make throughout an experimental session. To do so, we calculate for each subject the following:

1. Number of times the subject was the proposer;
2. Number of times the subject proposed an equal split;
3. Number of times the subject proposed a proportional split.

Since subjects were called to propose by chance, the number of times they were proposers differs. As such, it is natural to consider the proportion of proposals made by each individual subject that was a proportional split or an equal split. Note that these are not exhaustive categories.

We categorize a subject as being *consistent* if she makes the same type of proposal 70% of the time or more. As Table 13 shows, there is very little evidence for consistency in both categories. The largest levels of consistency are observed in NC-NO for equal splits (21.56%) and proportional splits in C-O (18.75%).

Table 13: Percentage of Subjects that Propose in a Consistent Manner throughout the Session[1], by Treatment

Treatment	**Equal Split**	**Proportional Split**
NC-NO	21.56	0
C-NO	12.31	4.62
NC-O	2.37	2.38
C-O	7.81	18.75

[1] A subject is categorized as being consistent if he or she makes the same type of proposal 70% of the time or more. We only include in the analysis subjects that proposed two or more times.

6 Analysis of Self-serving Bias in Proposals

To investigate if there is evidence of self-serving biases in distributions of the common fund, we classified subjects in two groups: below median contributors (i.e. the lowest contributor of the group) and at or above-median contributors (the two highest contributors). Since higher investors would benefit more from proportional sharing than lower investors, differences in fairness index between these two groups can be interpreted as evidence of a self-serving bias at play.

When investments are observable and no communication is possible, accepted proposals from below-median contributors have an FI=0.67 on average which is lower than 0.84 for higher contributors, consistent with the fact that proportionality favors higher contributors. Interestingly, the difference is smaller when subjects can communicate with each other. To investigate if these differences are significant, we conducted an regression accounting for session level and subject level random effects presented in Table 14. In both treatments, higher contributing members significantly distribute closer to the proportionality standard, albeit the effect is weaker when there is chat.

In Table 15 we investigate the likelihood of calling for a proportional distribution of the surplus as a function of the player's contribution.

Table 14: Random Effects Linear Regression for Fairness Index of Accepted proposals in Treatments with Observability

	Dep. Var: Fairness Index
At or Above Median Investment	0.13***
	(0.030)
Communication	0.12**
	(0.047)
At or Above × Communication	-0.09*
	(0.038)
Constant	0.71***
	(0.037)
Num. Obs.	400
χ^2	23.19

Standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.01$

Table 15: Random Effects Probit for Mentioning Proportionality in Chat Treatment with Observable Investments.

	Probability of Mentioning Proportionality	
	(1)	(2)
At or Above Median Investment	0.25	0.44***
	(0.152)	(0.080)
Proposer	-0.32	
	(0.446)	
At or Above × Proposer	0.57	
	(0.449)	
Constant	-1.02***	-1.12***
	(0.161)	(0.140)
Num. Obs.	753	753
χ^2	27.03	30.39

*,**, and *** denotes significance at the 0.1, 0.05, and 0.01 levels or better. Standard errors clustered at the session level reported in parentheses.

7 Instructions

Text with solid underline appears only in treatments observable investments (C-O & NC-O).

Text with dotted underline appears only in treatments with unobservable investments (C-NO & NC-NO).

Text with dashed underline appears only in treatments with chat (C-O & C-NO).

Experiment Instructions

This is an experiment in the economics of decision making. We follow a no-deception ethical policy at the Economics Lab, hence these instructions fully describe the experiment.

A Brief Overview of the Experiment

In this experiment you will be part of a group of 3 people. Each of you must decide individually how many tokens to contribute into a common account. The tokens that you and the other two group members contribute will be added up and multiplied times 1.8. All of you will learn how much each person in your group contributed. Next, one of you will be asked to propose a distribution of the group's fund among the members and, before a proposal is submitted, group members will be able to communicate with each other through a chat screen. Proposals are voted up or down according to the simple majority rule. In case the current proposal is rejected, the members of the same group proceed to another chat, proposal and voting round until one allocation is approved. The details of the experiment follow.

The Details of the Experiment

As expressed above, this experiment involves four main parts: **(1) contribution, (2) chat, (3) proposal, and (4) vote.** We proceed to fully explain each stage.

(1) Contribution

You are endowed with 50 tokens initially and will be asked to enter a contribution that you wish to make to the group's account no greater than your initial endowment. Whatever amount you decide to give is multiplied by 1.8.

(2) Chat

The computer will randomly choose one of you to be the proposer of a distribution of the total common account (which equals the sum of contributions times 1.8). Before doing so, you will have three minutes in which you can exchange written messages with the other two members of your group. Members who are not proposers will not be able to communicate with each other, only with the proposer. Please be respectful and do not reveal your identity or personal information while chatting.

(3) Proposal

In this stage the proposer submits a division of the total group account.

(4) Voting

You will observe how much the proposer assigned to each member of the group. You can then click "accept" or "reject". For approval, the proposal requires a simple majority (at least 2 votes).

If rejected: every member in your group will proceed to stage (2) with a member randomly selected as proposer. Feedback on the previous proposal, the voting result, and who was the proposer will be given to you.

The process repeats itself until an allocation of the group account is approved. If 5 rounds of proposing go by without approval, thereafter there is a 50% probability that no more proposals take place. In this case, all group members receive 0 tokens from the common account. For example, following a rejection in round 6, the probability that round 7 takes place is 50%.

If approved: the result will be binding and you will learn how much each person contributed and earned. Next, you will then be matched into new groups to repeat the stages (1)-(4). You will participate in a total of 10 periods. In each period, you will be randomly reassigned into a group of 3 people, and your subject number for each period is determined randomly too. This is, in period 1 you can be subject A, and in period 2 you can be subject C.

Your Earnings

Only 1 of the 10 periods will be randomly selected for payment. Your earnings (E) are then given by

$$E = \underbrace{(50 - Contribution)}_{How\ much\ you\ kept} + Assigned\ Share$$

The conversion rate between tokens and dollars is 5 Tokens = 1 dollar. In addition to your earnings from the experiment, you will receive a $5 show up fee. Hence, your final payment is given by:

$$Payment = 5 + E/5$$

Are there any questions so far?

Example.

Below, we provide an example for you to understand how the payoffs of the experiment work.

Consider a 3 person group in which individuals are endowed with 50 tokens and each unit contributed to the group account is multiplied times 1.8. If Person A contributes 1, Person B contributes 10, and Person C contributes 9, then the total fund to distribute will be

$$1.8 \times (1 + 10 + 9) = 36$$

Suppose that player C was randomly chosen as the proposer and distributed the group account as follows: 10 for A, 20 for B, and 6 for C. Then, if votes are respectively "yes"," no", "yes", the proposal is accepted. If this period was randomly chosen for payment, player A would receive

$$E = \underbrace{49}_{50-Contribution} + \underbrace{10}_{Assigned\ Share}$$

Similarly, player B would receive 40+20 and player C will receive 41+6. This is just an example; you do not have to do this. Instead, votes could have been "no","no", and "yes". Hence a new proposal round would take place.

Are there any questions?

Review of the experiment

1. Everyone is randomly assigned into groups of 3
2. Out of your 50 token endowment, you will decide how much to contribute to the group account
3. The sum of members' contributions will be multiplied times 1.8. Your contribution will not be displayed for others to see until a proposal has been accepted.
4. One of you will be randomly chosen as the proposer.
5. You will have three minutes to chat with the proposer.
6. Once a proposal is made, voting will take place. If a majority accepts, the allocation is binding, and you will wait in standby until the other groups decide on an allocation.
7. If a majority rejects, the process repeats itself until a given allocation is accepted.
8. Once an allocation is accepted, you will start a new period with randomly selected members. 1 of the 10 periods of play will be chosen randomly for payment.

What should you do? If we knew the answer to this question, we would not need to run an experiment.

8 Screenshots of Experimental Software for Treatment of Communication with Observable Investments.

Figure 2: Investment Screen (all treatments)

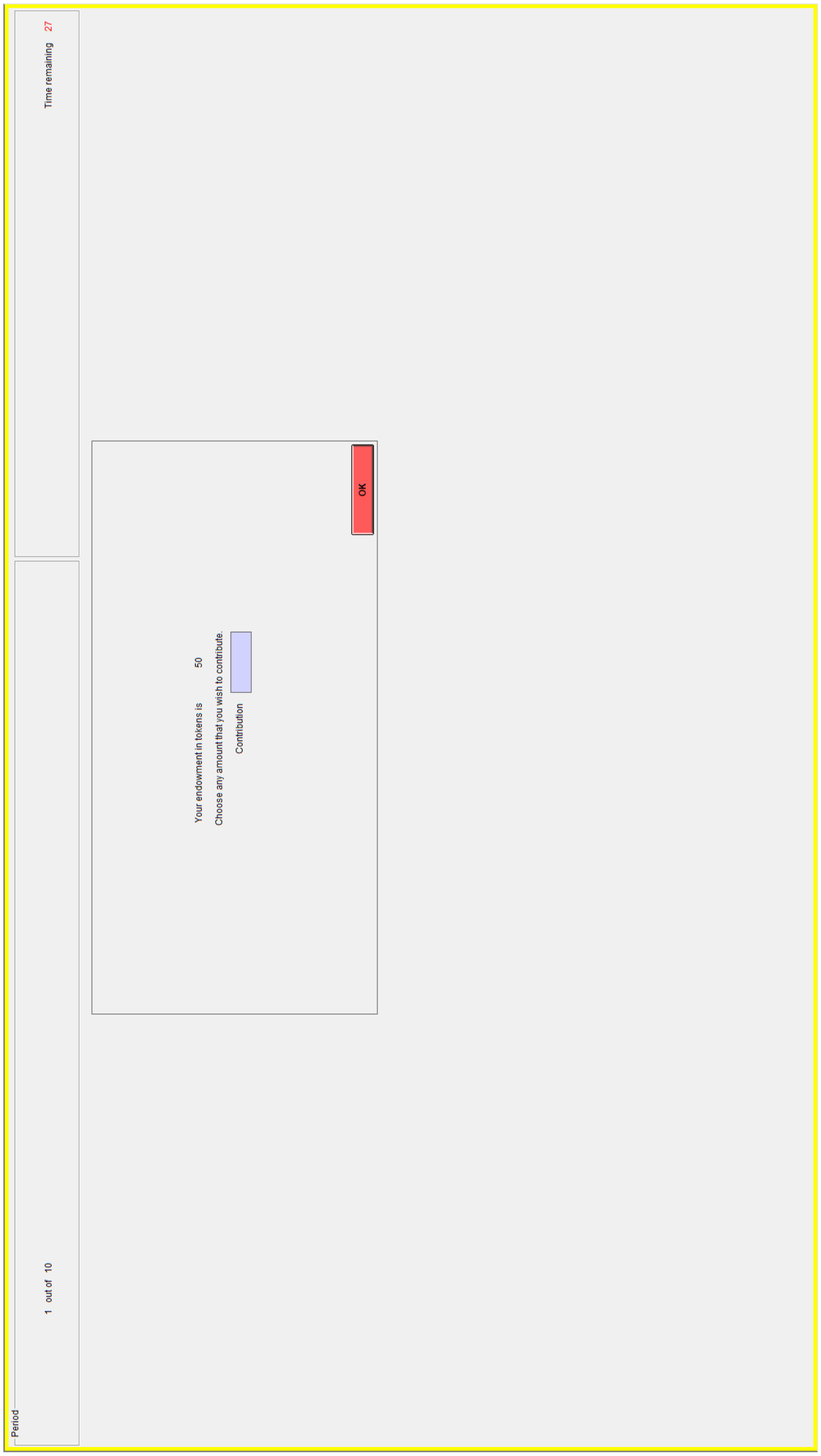

Figure 3: Proposal stage with Chats Screens for Proposers

Figure 4: Proposal stage with Chats Screens for Voters

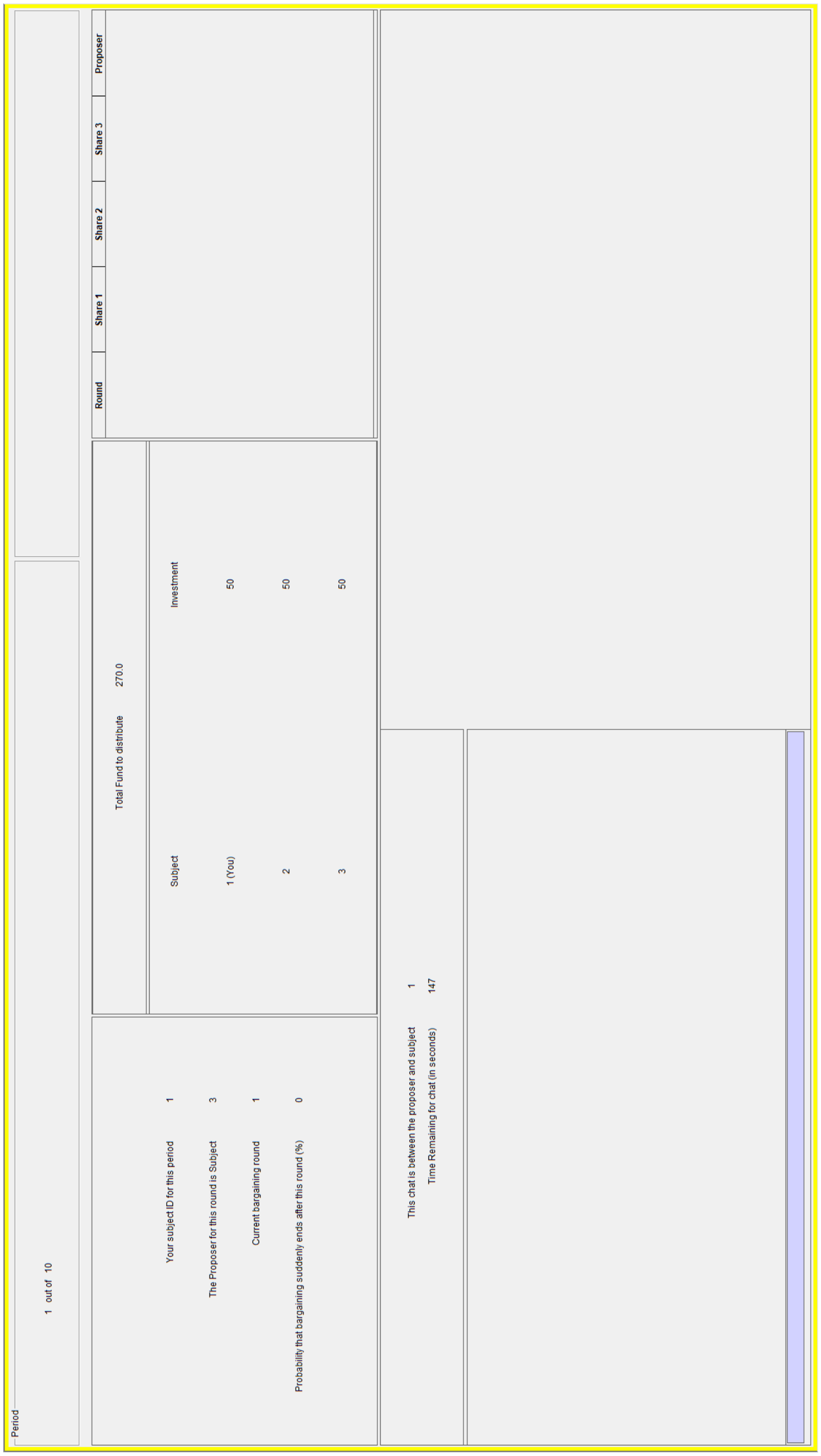

Figure 5: Voting Screen