Appendix 1: Proof: Without a vote of confidence procedure

I prove this with backward induction.

If $g < \frac{n+1}{2n}$ *then the public good is never offered.*

Last period

If the proposer prefers to offer earmarks then he has to offer members of the legislature at least 1/n (the outside option). Thus he can keep the remaining amount, $(n+1)/(2n)$.

Thus, if $g < \frac{n+1}{2n}$ then the public good is not offered.

The ex-ante value of being in the ruling coalition in the last period (i.e. before a proposer is chosen) is: 1/c (n + 1)/(2 n) + (1 − 1/c) (1/2) (1/n) = 1/(2c) + 1/(2n), i.e. the probability of being the proposer and earning the proposer share plus the probability of not being the proposer and having one half chance of earning 1/n. The value of the last period value is 1/(2n) for those not in the ruling coalition (one half chance of receiving 1/n).

Second to last period

Let *x* be the amount that makes a member of the coalition indifferent between voting in favor of a bill or against it. If a bill fails, a member of the coalition will receive 1/n plus the value of being in the ruling coalition in the last period (indeed, without a vote of confidence procedure, the coalition remains the same across all periods regardless of the outcome of a vote), is 1/(2c) + 1/(2n). If the bill passes and a coalition member is offered *x*, then he will receive x+1/(2c) + 1/(2n). Thus, the minimum amount the proposer should offer a member of the coalition is 1/n. This is the same amount as what makes a non-member vote in favor of a bill. Thus the proposer is indifferent as to who to transfer pork to.

The proposer can now keep: 1 − (1/n) ((n + 1)/2 − 1) = (n + 1)/(2 n).

The value of the second to last period if one is in the ruling coalition is thus the same as in the last period: 1/(2c) + 1/(2n). Therefore, the continuation value of the second to last period if one is in the ruling coalition is 2x[1/(2c) + 1/(2n)]. For those outside the ruling coalition, those values are 1/(2n) and 1/n (which is 2x1/(2n)).

All earlier periods

Since the ruling coalition remains fixed regardless of the outcome of a vote, the ex-ante value of a period is always 1/(2c) + 1/(2n) and the "price" of a yes vote is always 1/n since the current decision does not affect the next period's outcome. Therefore, each period, the proposer can keep 1 − (1/n) ((n + 1)/2 − 1)= (n + 1)/(2 n) and the public good is never offered.

It also follows that the continuation value of being in the ruling coalition when there are *t* periods left is $t[1/(2c) + 1/(2n)]$. The continuation value of not being in the ruling coalition $t1/(2n)$

If $\frac{n+1}{2n} < g$: public good is always offered.

This follows directly from the above derivation.

Appendix 2: Proof: With a vote of confidence procedure

If $g < \frac{n+1}{2n}$ then the public good is never offered.

Last period

If the proposer prefers to offer earmarks then he has to offer members of the legislature at least 1/n (the outside option). Thus he can keep the remaining amount, $(n + 1)/(2n)$.

The ex-ante value of being in the ruling coalition in the last period (i.e. before a proposer is chosen) is: 1/(2c) + 1/(2n). This value is 1/(2n) for those not in the ruling coalition (one half chance of receiving 1/n).

Second to last period

The proposer now has to offer 2/n − (1/(2c) + 1/(2n)) to someone in the ruling coalition for them to vote yes.[52] Offering someone out of the ruling coalition a transfer would require 2/n − 1/2n, a higher amount. So the proposer offers transfers only to the members of the ruling coalition. Thus the proposer can keep (c(3 + n) + n(n − 1))/(4cn), which is greater than (n + 1)/(2n) so again the public good is not offered.

The value of the second to last period if one is in the ruling coalition is thus 1/c[53] and the continuation value if in the ruling coalition is 1/c + 1/(2c) + 1/(2n). For those outside the ruling coalition, those values are both 1/(2n) since they receive nothing in the second to last period and have a half chance of receiving 1/n in the last one.

All earlier periods

Since being in the ruling coalition is valuable, its value increases with the number of periods left. Thus, if it is not advantageous to offer the public good in the second to last period, it is equally not advantageous to offer it in earlier periods. The value of being in the ruling coalition with *t* periods left is (t − 1)/c + 1/(2c) + 1/(2n).

If $\frac{n+1}{2n} < g < \frac{1}{n} + \frac{n-1}{2c}$: public good is offered in the last period only.

[52] If the proposal is voted down, then all members receive 1/n and since the next period is a coalition formation period, they again receive 1/n so that the value of voting against the proposal is 2/n.

[53] Which is the probability of being the proposer times the amount the proposer can keep for himself, plus the probability of not being chosen times the amount that he would receive.

Last period

The proof is straightforward and follows directly using the same reasoning as above: the amount the proposer can keep is lower than the value of the public good and so the proposer will choose to offer the public good instead.

Second to last period

The proposer now has to offer $\max(2/n - g, 0)$ to someone in or out of the ruling coalition, which is negative for $n > 3$ so the proposer can keep the entire budget for himself. The continuation value for members of the ruling coalition (before a proposer is chosen) is 1/c + g and for those outside the ruling coalition is simply g.

Third to last period

If the proposer offers transfers, he must offer at least $\max(2/n + g - (1/c + g)$ to the members of the ruling coalition and can keep 1/n + (n − 1)/(2c) for himself. This is greater than the value of the public good and so will choose to offer earmarks.

All earlier periods

Using similar reasonings, proposers never offer the public good if $g < \frac{1}{n} + \frac{n-1}{2c}$.

If $\frac{1}{n} + \frac{n-1}{2c} < g < 1$: public good is offered in the last and third to last period only.

Last period

The proof is straightforward and follows directly using the same reasoning as above: the amount the proposer can keep is lower than the value of the public good and so the proposer will choose to offer the public good instead.

Second to last period

The proposer now has to offer 2/n − (1/(2c) + 1/(2n)) to someone in the ruling coalition for them to vote yes.[54] Offering someone out of the ruling coalition a transfer would require 2/n − 1/2n, a higher amount. So the proposer offers transfers only to the members of the ruling coalition. Thus the proposer can keep (c(3 + n) + n(n − 1))/(4cn), which is lower than (n + 1)/(2n) so the public good is offered.

The value of the second to last period if one is in the ruling coalition is thus 1/c[55] and the continuation value if in the ruling coalition is 1/c + 1/(2c) + 1/(2n). For those

[54] If the proposal is voted down, then all members receive 1/n and since the next period is a coalition formation period, they again receive 1/n so that the value of voting against the proposal is 2/n.

[55] Which is the probability of being the proposer times the amount the proposer can keep for himself, plus the probability of not being chosen times the amount that he would receive.

outside the ruling coalition, those values are both 1/(2n) since they receive nothing in the second to last period and have a half chance of receiving 1/n in the last one.

Third-to-last period

If the proposer offers earmarks, he has to offer at least $\max(2/n + g - (1/c + g), 0) = 2/n - 1/c$ to those in the ruling coalition for them to vote yes and so can keep 1/n + (n − 1)/(2c) for himself. This is smaller than the value of the public good and so chooses to invest the budget in the public good instead.

The continuation value for a member of the ruling coalition (before the proposer is chosen) is therefore: 1/c + 2g.

Fourth-to-last period

If the proposer offers transfers he has to give the members of the ruling coalition at least $\max(3/n + g - (1/c + 2g), 0) = 0$. Thus the proposer can keep the entire budget for himself. This represents a higher amount than the value of the public good and so the proposer chooses to finance earmark projects.

All earlier periods

Since being in the ruling coalition is valuable, its value increases with the number of periods left. Thus, if it is not advantageous to offer the public good in the fourth-to-last period, it is equally not advantageous to offer it in earlier periods. The value of being in the ruling coalition with t periods left is (t − 1)/c + 1/(2c) + 1/(2n).

If $g > 1$: public good is always offered. The proof is obvious.

Appendix 3: Formal proofs for testable predictions I–IV

Prediction I

Without the vote of confidence procedure, proposers offer the public good if its value is greater than (n + 1)/(2n), regardless of the period. With a vote of confidence procedure, for the public good to be offered in every period, its value must be greater than 1. This implies Prediction II (a): the public good is offered less often if legislators have access to the vote of confidence procedure. This also implies Prediction II (b): when it is offered its value is on average higher with a vote of confidence procedure. Indeed, lets assume that public good value is drawn from a distribution with support $[0, B]$ with $B > 1$. In this case the expected value of the public good is $B/2 + 1/2$ if it is offered under the vote of confidence procedure, whereas it is $B/2 + (n + 1)/(4n)$ without the vote of confidence procedure.

Prediction II

Without the vote of confidence procedure, members of the ruling coalition do not risk loosing their seats if the proposal is turned down and turning a proposal down does not impact future periods $(V^a_{in,t} = V^r_{in})$. Thus the outside option for members of the coalition is 1/n, the same as it is for those legislators not in the ruling coalition. Therefore the proposer has no reason to treat any two legislators differently and the probability of each of the legislators, regardless of whether they are part of the ruling coalition, to receive a transfer is 1/2 (since 2 of the 4 legislators receive a transfer). With a vote of confidence procedure for a member of the coalition to be indifferent between voting yes or no to a proposal offering him b, it must be that $b + V^a_{in,t} = 1/n + V^r_{in}$. However, given Theorem 2.2 $V^a_{in,t} > 1/n + V^r_{in}$, so that $1/n$ is greater than b. For those not in the ruling coalition, $V^a_{in,t} < V^r_{in}$, implying that it would cost the proposer a positive amount greater than 1/n to buy their vote. Hence, those who are outside the ruling coalition are more expensive unlike the situation without a vote of confidence procedure.

Prediction III

Given Theorems 2.1 and 2.2 as well as Prediction II, when there is a vote of confidence procedure, the proposer can keep a larger fraction of the budget for his own district. Indeed, in order to buy a "yes" vote, the proposer must offer 1/n to two members of the legislature when there is no vote of confidence procedure. With a vote of confidence procedure the price of a "yes" vote is strictly less than that. Thus the distribution of the budget will be more unequal under the vote of confidence procedure. Further, since under the vote of confidence procedure members of the ruling coalition always vote in favor of bills while legislators not in the ruling coalition always vote against bills. Thus, voting cohesion is 100 %. Without the vote of confidence procedure, since after a proposer is chosen all legislators have equal chances of receiving a transfer, the members who vote in favor of a bill is likely to change across periods and voting cohesion is less than 100 %.

Appendix 4: First spending-proposal exception

In the *first* spending-proposal period, however, I used a strategy method (Becker et al. 1964) to elicit the minimum value of the public good for which proposers would choose to offer it instead of earmarks. We asked each subject in the ruling coalition to distribute the dollar budget among all five members of their group. We also asked them a cutoff value for the public good. We told them that for this period we would randomly draw a value for the public good, and that that value would be between 0 and 1.444. The upper value for the public good was chosen so that the theoretical cutoffs would not be obvious focal points. The distribution of the public good values is irrelevant according to the theory as only the value of the particular draw of the public good matters. If that value was above their cutoff then their proposal would be to offer everyone the value of the randomly drawn public good. If that value was below their cutoff then their proposal would be the division of the dollar they chose.

The goal of this part of the design was to elicit this information precisely. Indeed for all subsequent periods, subjects were faced with a particular (random) value of

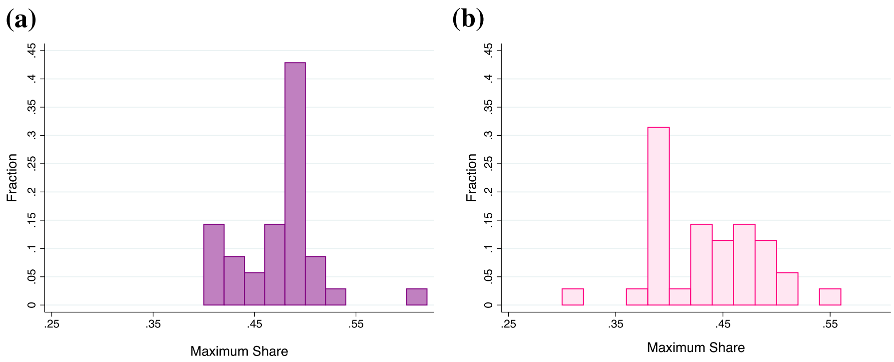

Fig. 3 Histograms of the maximum shares in proposals that forwent the public good in favor of earmark projects (second half of rounds only), **a** With the vote of confidence procedure, **b** Without the vote of confidence procedure

the public good, and the data would therefore only allow for an imprecise measure of this cutoff. According to the theory, with a minimum sized ruling coalition and a legislature of size 5, with the vote of confidence procedure that cutoff should be 1, while without the vote of confidence it should be .6.

Both regression results as well as ranksum and Kolmogorov-Smirnov tests (using, for each subject, the mean cutoff value as the unit of comparison) show that for this question there is no notable difference between the two treatments. The data reveal that many subjects choose numbers below .2 (when this is inefficient) or above 1. Therefore, it is conceivable that the subjects mis-understood the instructions, as sometimes happens with the elicitation method, or simply did not have enough experience with this part of the experiment. Indeed, only those in the ruling coalition participate in this round, and only of those members' choice is implemented. On average, subjects' had only a single opportunity to learn from their past behavior.

In the analysis, I will thus only look at the periods in which subjects were shown the value of the public good and had to choose whether to offer it or not.

Appendix 5: Unequal distributions

Figure 3 represents the distribution of the highest share for those proposals that offer unequal splits. The unit of measure is how much, on average, each subject keeps for himself in those proposals.[56] As we can see from the histograms, in the treatment with the vote of confidence procedure, the distribution is shifted right relative to the distribution without the vote of confidence procedure.

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[56] For example, suppose that when a proposer forwent the public good he then submitted proposals in which he always kept the entire endowment, then this subject would have an average maximum share of 1 (or 100 %). If a subject submitted proposals in which he kept half of the budget for himself 30 % of the time and all of the budget for himself for 70 % of the time, then his average maximum share would be .85 (or 85 %).

Table 4 Summary statistics on ruling coalition formation for the first period

	With vote of confidence	W/o vote of confidence
% of proposed ruling coalitions that are minimum size		
First four rounds (%)	53	63
Last four rounds (%)	81	78
% of proposed minimum size ruling coalitions that pass right away		
First four rounds (%)	94	100
Last four rounds (%)	96	96
% in the proposed ruling coalition who vote in favor		
First four rounds (%)	97	100
Last four rounds (%)	99	97

Appendix 6: Results on ruling coalition formation

Prediction IV: minimum ruling coalitions

With (without) vote of confidence procedure, if there are at least two voting periods left, a minimum-winning ruling coalition is proposed and accepted in the first period.

Intuition/Proof

This result is quite intuitive: only individuals in the ruling coalition have a positive probability of being selected to make a proposal. Hence, the larger the size of the ruling coalition, the smaller the probability of being chosen to make a proposal. Thus, the payoff of being in the ruling coalition is decreasing in c, the size of the ruling coalition, and if the value of the public good is "low" (that is such that it will not be offered), then a proposal in which the size of the ruling coalition is minimum passing will give a member of the ruling coalition the highest expected value. Even if subjects are not yet aware of the value of the public good g, it is a dominated strategy to choose a non-minimum ruling coalition since there is a chance that the public good value will be too low and thus not offered.

Laboratory result

In the laboratory, following the theory, a majority of the ruling coalitions are of minimum winning size, and they pass right away.

Table 4 presents further summary statistics concerning the ruling coalition formation periods for those proposals that made it to the floor. In both treatments, by the last four rounds, close to 80 % of proposed ruling coalitions are of minimum size, which is close to the theoretical prediction (100 %). Further, more than 95 % of the proposed minimum-sized ruling coalitions that make it to the floor for a vote

Table 5 Predicting offering the public good in the last four rounds

	Regression I	Regression II
Vote of confidence procedure	−.99*** (−2.59, 0.01)	5.23 (1.83, 0.160)
Value of Public Good	26.84*** (8.16, 0.000)	34.12*** (5.57, 0.000)
Value of public good & Vote of confidence procedure		−12.00 (−1.96, 0.050)
Constant	−7.99*** (−8.15, 0.000)	−10.06*** (−6.22, 0.000)
# Of subjects	78	78
# Of observations	528	528

Coefficient and in parenthesis standard errors and p values

** Significance at 5 %, *** 1 %

pass right away. Finally, and unsurprisingly perhaps, virtually all members who are in proposed ruling coalitions of minimum size vote in favor of it.

Appendix 7: Experimental instructions

(ONLINE APPENDIX)
INSTRUCTIONS

Please turn off all cellular phones and pagers. Please remove anything on the tables other than these instructions, and the sheet of paper and pen that you were given.

This is an experiment on decision-making. If you follow the instructions closely and make good decisions, you can earn a considerable amount of money, which will be paid to you in private at the end of the session.

This experiment is composed of 8 ROUNDS. Each round is independent of the others.
Each round is composed of 6 STAGES.

In this experiment you will act as voters that distribute funds between yourself and others in a series of stages. In each stage you must either decide who can make proposals or you make a proposal on how to allocate money. Proposals will be voted up or down (accepted or rejected) by simple majority rule.

ROUNDS:

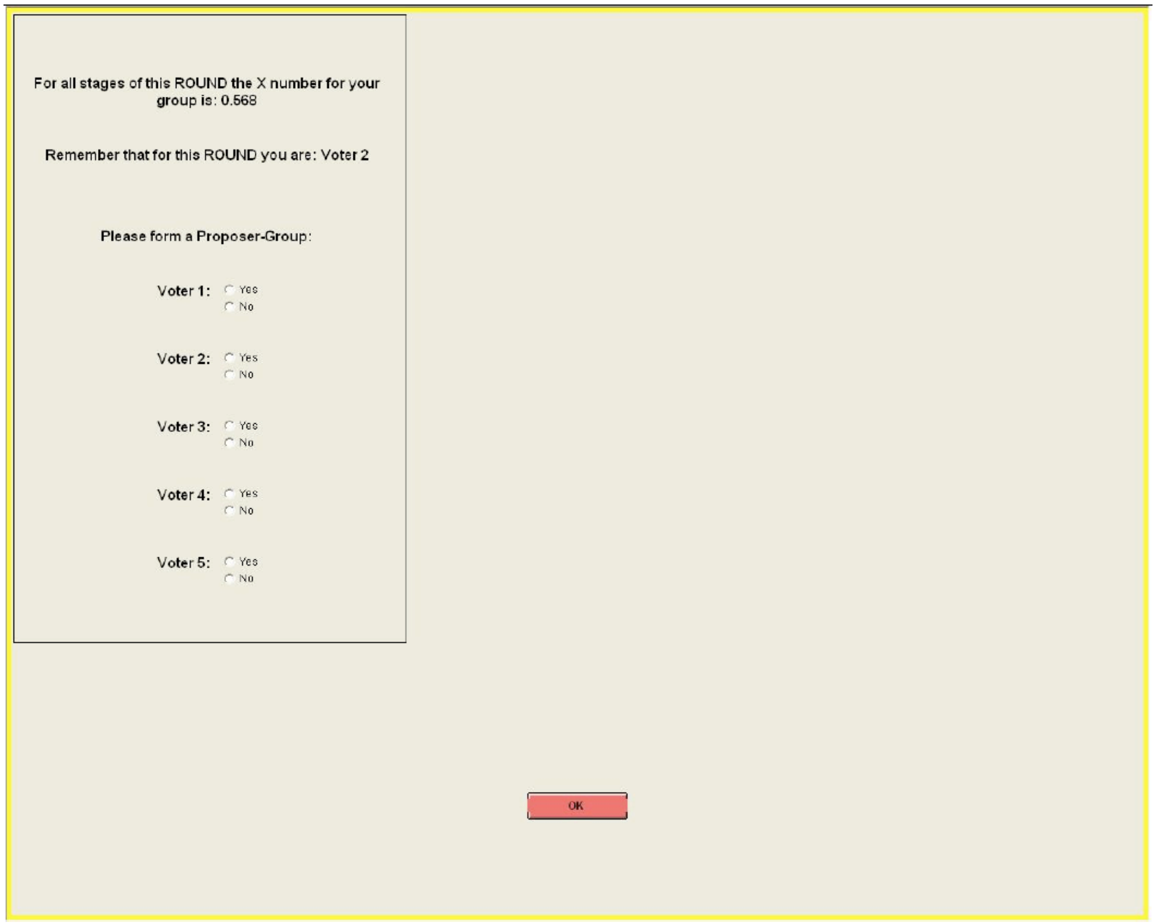
Before the first stage of a round, you will each be randomly matched with four other participants to form groups of five voters. Each group of five is independent of the others. These groups remain the same for the duration of the round.

The five members of each group will be assigned an identity: "Voter1," "Voter2," "Voter3," "Voter4" and "Voter5." You will keep this identity for the duration of the round.

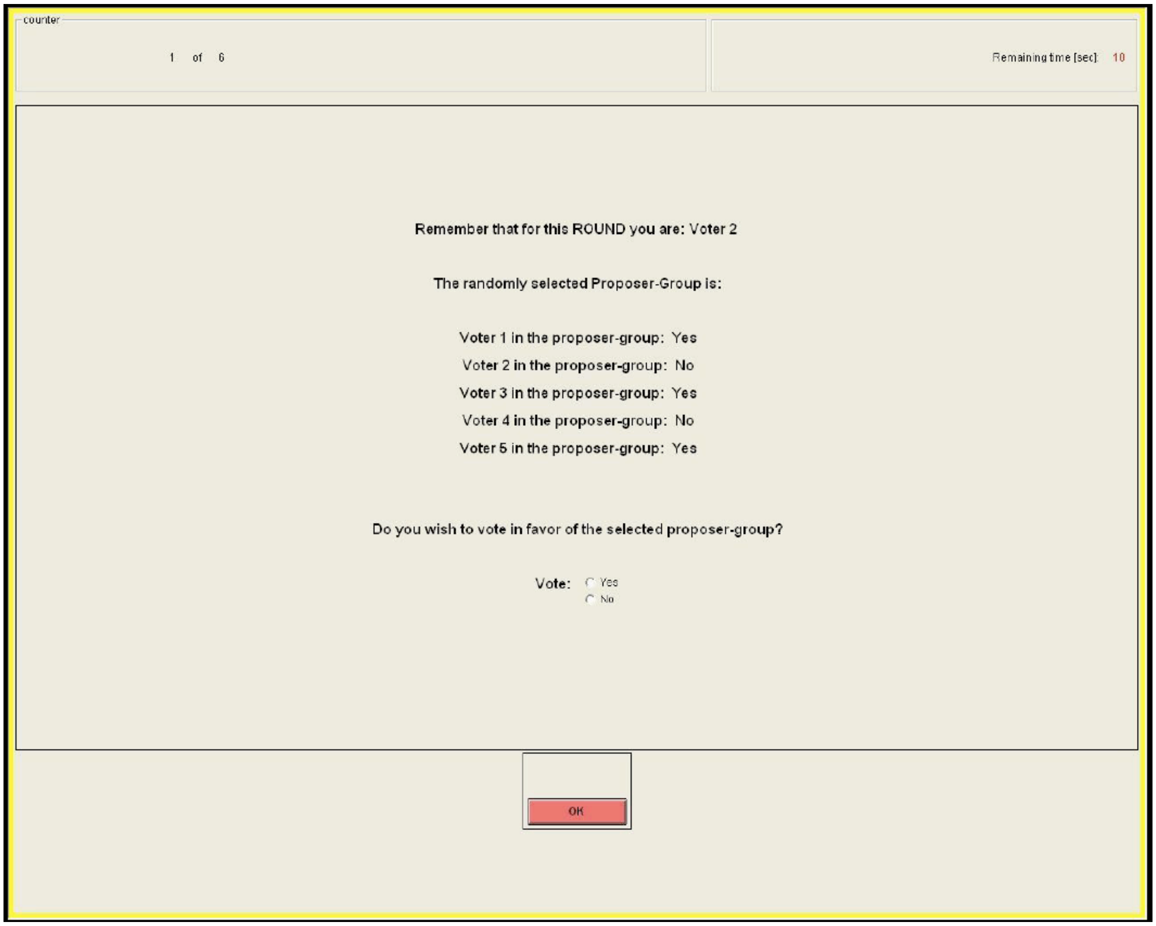
Your role in a stage will be either to determine a proposer-group (*proposer-group stages*), or to determine an allocation (*allocation-proposal stages*) – more on this below.

STAGE 1 is a *proposer-group stage*. Each of you will be asked to select who, in the group of five voters that you belong to, should be part of a proposer-group, the proposer-group is the group of voters who can make allocation proposals (more on this below).
One of these 5 proposals will be randomly chosen and all five people in your group will vote on the selected proposer-group. The results of the vote will be shown to you. The selected proposer-group passes if a simple majority of people vote in favor of it (if it receives 3 yes votes or more). As with all proposer-group stages, 1 experimental dollar will be divided equally among all five members of your group (so each person gets 0.2 experimental dollars) regardless of the outcome of the vote.

Below is a snapshot of what the screen will look like at this stage.



When it’s time to vote on the proposer groups, the screen will look like this:



STAGE 2 can take one of two forms.

If the proposer-group was voted down (less than 3 yes votes), then STAGE 2 is a repeat of STAGE 1 (a proposer-group stage).

If the proposer-group proposal was voted up (3 or more yes votes), then STAGE 2 is an *allocation-proposal stage*.

For a given round, the very first time that you are in an allocation-proposal stage, just before the members of the proposer group do anything, the computer will randomly and independently choose a number *Y* between 0 and 1.444. *Y* will be chosen randomly and independently for each member of the proposer group. Members of the proposer group will NOT observe *Y* at this point. The members of the proposer group will have to do two things.

A. They choose how to divide 1 experimental dollar among the 5 members of the group.
B. They each choose a number *Z*. *Z* can be any number between 0 and 1.444.

Z is a cutoff value and has the following consequences: if it turns out that *Y* is greater than *Z*, then the allocation proposal for that member will be "offer everyone *Y*." If it turns out that *Y* is smaller than *Z* then the allocation proposal for that member will be to offer people amounts according to the division of the 1 experimental dollar they chose in A.

For example, say you are in the proposer group and the way you chose the experimental dollar to be divided was:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0	0.46	0.22	0.22

and you chose *Z* to be 0.11

Suppose also that the computer's *Y* value for you was 0.17
In this case, since *Y* is larger than the *Z* you chose (0.17 > 0.11), your allocation proposal will be: "offer everyone 0.17", and not the allocation in which you divided 1 dollar. If you are the randomly chosen proposer, then the proposal that everyone will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.17	0.17	0.17	0.17	0.17

However, if *Y* had been 0.05, then your allocation proposal would be the division of the dollar since 0.05 < 0.11. If you are the randomly chosen proposer, then the proposal that everyone will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0	0.46	0.22	0.22

Let's do one more example: say you are in the proposer group and the way you chose the experimental dollar to be divided was:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0.1	0.1	0.1	0.6

and you chose *Z* to be 0.912

Suppose also that the computer's *Y* value for you was 0.72
In this case, since *Y* is smaller than the *Z* you chose (0.72 < 0.912), your allocation proposal will be the allocation in which you divided 1 dollar. If you are the randomly chosen proposer, then the proposal that all 5 members of your group will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0.1	0.1	0.1	0.6

However, if *Y* had been 1.26, then your allocation proposal would be “everyone gets 1.26” and not the division of 1 dollar (since 1.26 > 0.912). If you are the randomly chosen proposer, then the proposal that that all 5 members of your group will vote on is:

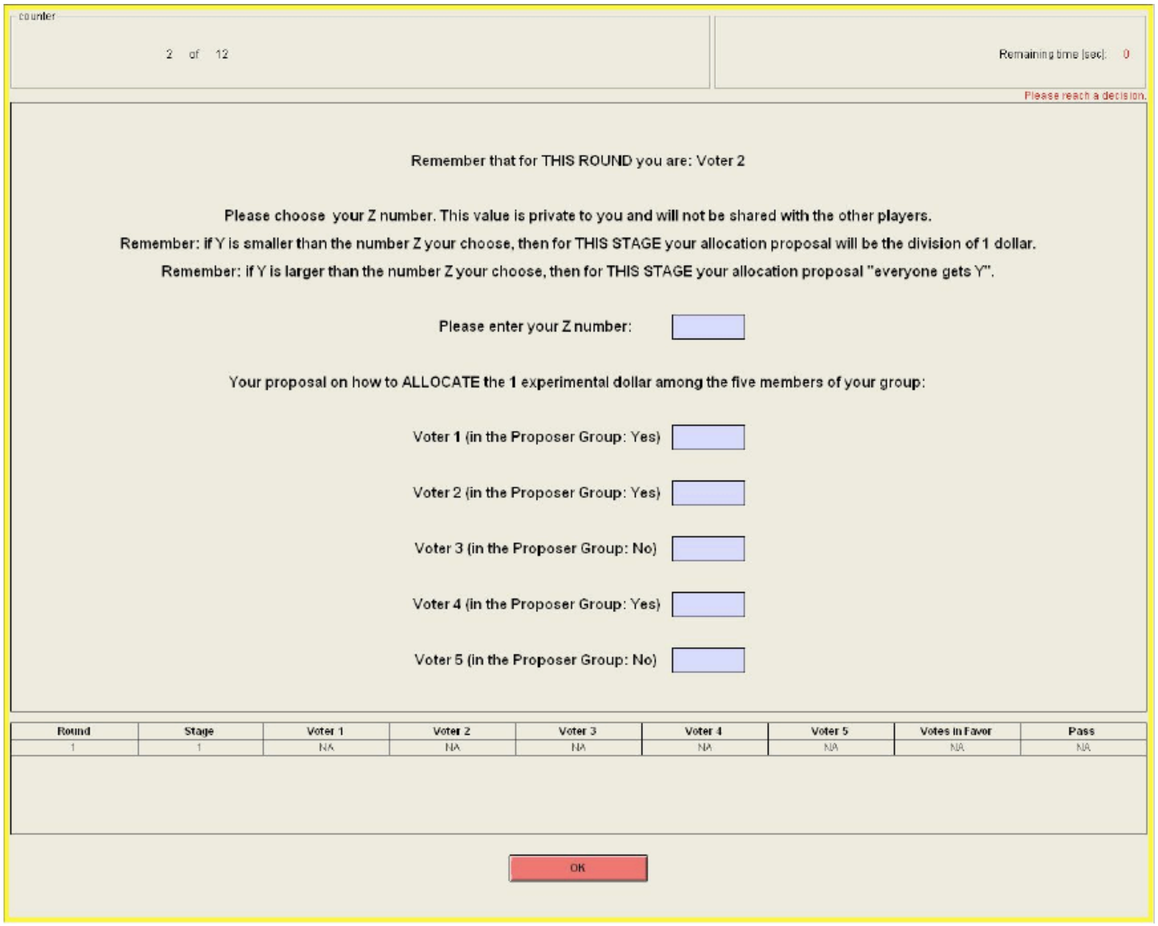
Voter1	Voter2	Voter3	Voter4	Voter5
1.26	1.26	1.26	1.26	1.26

Y is randomly chosen between 0 and 1.444.

One way you can think of Z is the following. Ask yourself: “Suppose Y is 0. Would I prefer my proposal to be “offer everyone 0” or the division of the dollar that I chose? Now suppose Y is a little bigger, say 0.001. Would I prefer my proposal to be “offer everyone 0.001” or the division of the dollar that I chose? And keep going until Y reaches 1.444: Would I prefer my proposal to be “offer everyone 1.444” or the division of the dollar that I chose. The cutoff value for which you would prefer to switch to “offer everyone Y” is the value that you should fill in for your Z number.

<u>It is in your best interest to reveal the cutoff *Z* truthfully.</u>

The members of the proposer group will see this screen:



So, after all members of the proposer-group have decided on their cutoff values Z and on how to divide the 1 experimental dollar, the computer will randomly choose one proposer-group member to be the proposer for this stage. Then the computer will compare the cutoff number that that member chose (so that member's *Z* number) and the *Y* value that was randomly chosen for that member.

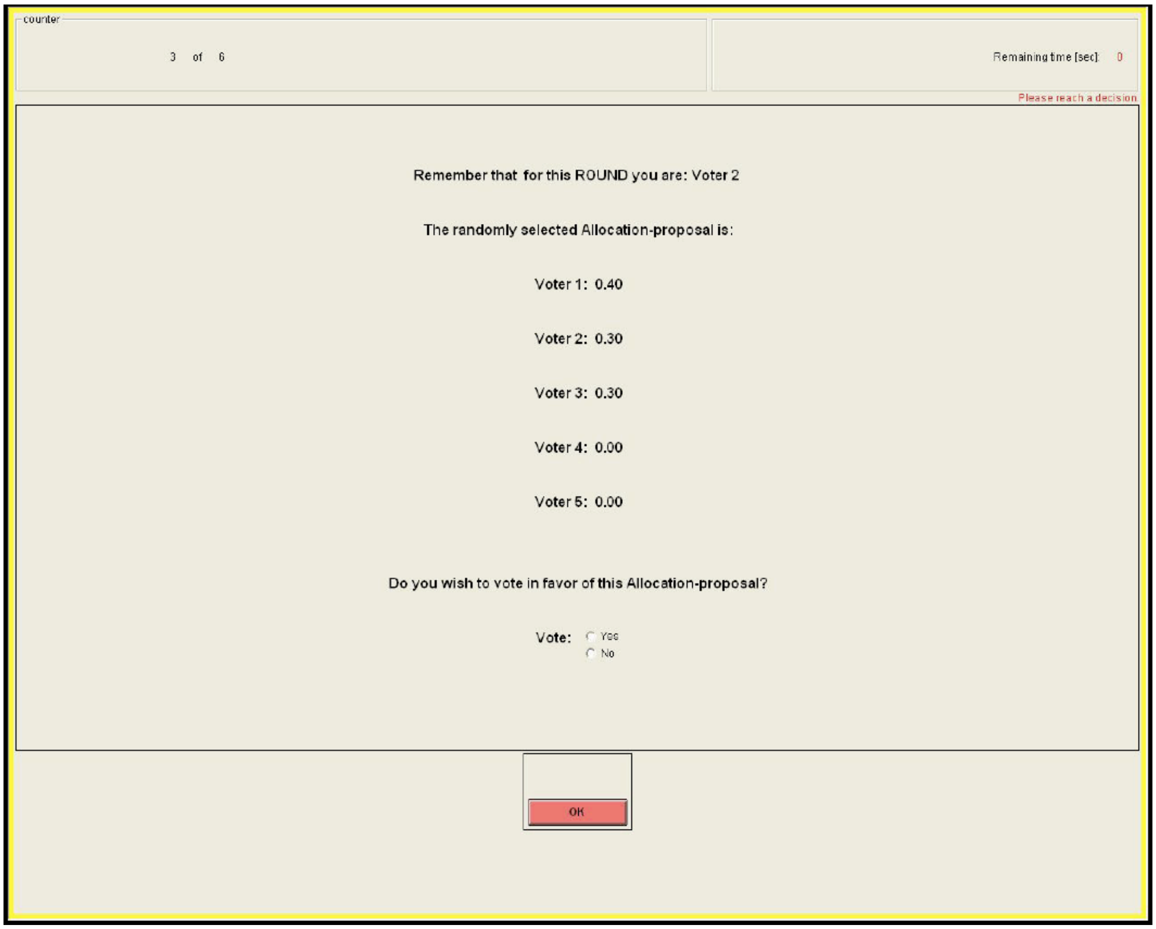
If *Y* is smaller than *Z* then the proposal that all 5 members of the group have to vote on is the division of the one experimental dollar. Nobody, aside from the proposer for that round, will find out what his or her *Z* was, and nobody will know what Y was.

If *Y* is greater than *Z* then the proposal that all 5 members of the group have to vote on is “everyone gets *Y*”. Still, nobody other than the proposer will know what his or her cutoff *Z* was.

If the randomly selected allocation-proposal is voted up (3 or more yes votes), then each member of the group receives the number of experimental dollars that was allocated to him/her in the randomly selected allocation-proposal, and the next stage is also an ALLOCATION-PROPOSAL stage, and the members of the proposer-group stay the same.

If the randomly selected allocation-proposal is voted down (less than 3 yes votes), 1 experimental dollar will be divided equally among the members of the group (so each person gets 0.2 experimental dollars), and the next stage is a PROPOSER-GROUP stage. That is, what was the proposer-group up to then is no longer, and again, all five voters of a group propose who they want to see in the proposer-group, a vote takes place etc., just like in stage 1.

The voting stage will look something like this:

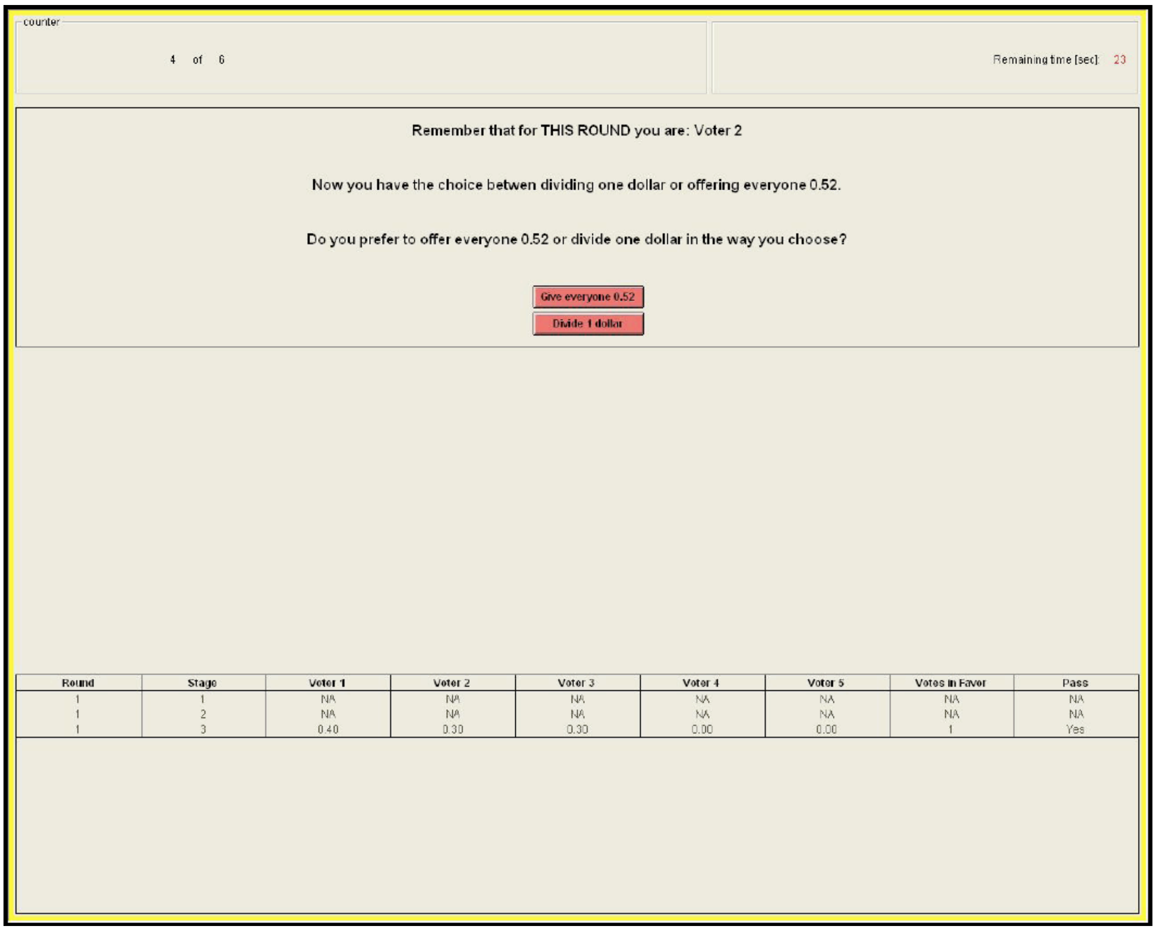


The above was about what happens in the very first allocation-proposal stage (so that happens only once in a given Round). All following allocation-proposal stages are described below.

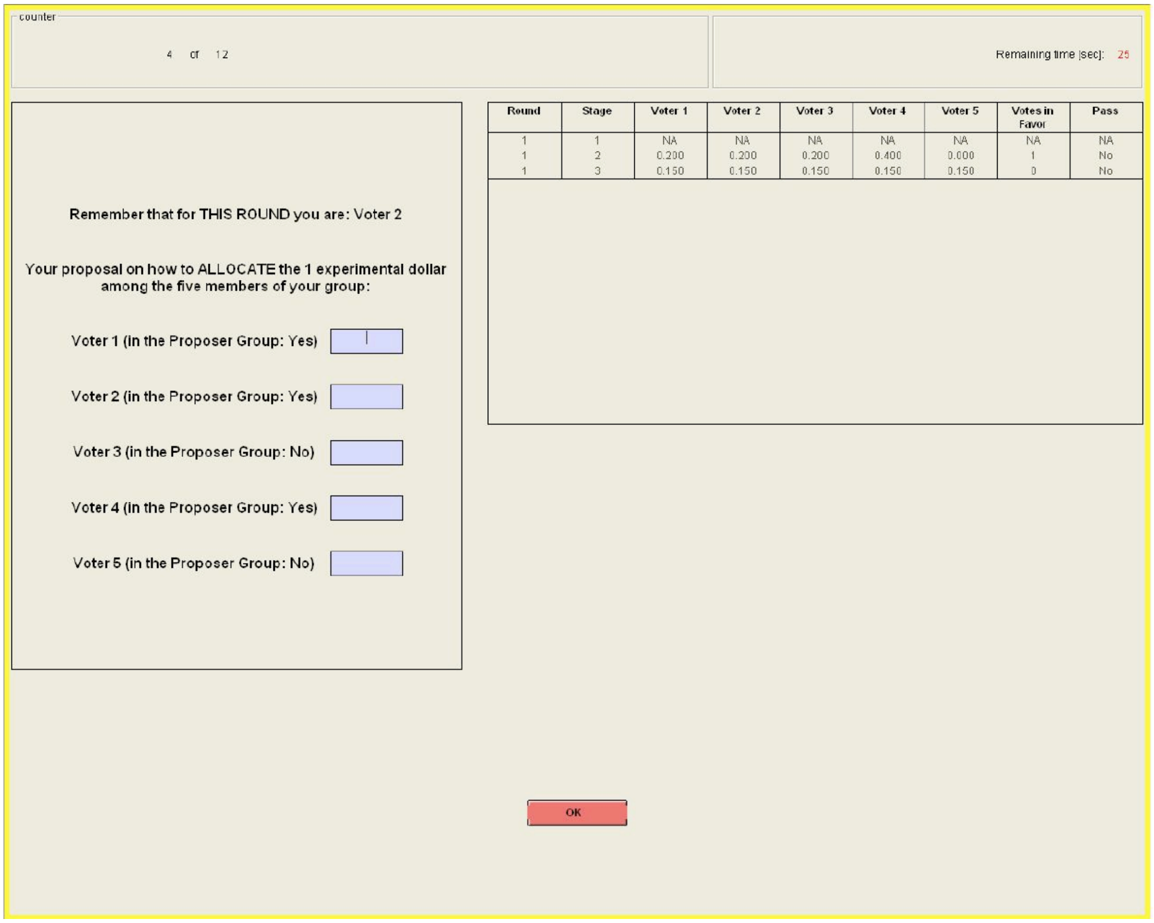
<u>**For a given round, in allocation proposal stages after the first one**</u>, the members of the proposer group will have to choose an allocation-proposal. They have the choice between two options. The first is offer *X* to everyone. *X* is revealed to you at the beginning of the round and

stays the same for all stages of that round. X is the same for all members of your group. The second is to choose how to divide one experimental dollar among the 5 members of the group. After all members of the proposer group have chosen between those two options, the computer randomly chooses one member in the proposer group, and it is his/her proposal that gets voted on.

The members of the proposer group will see something like the following screen:



Those who choose to divide the one experimental dollar will then see something like this screen:



If a proposal gets voted up, then the members get what was offered to them, and the following stage is an ALLOCATION-PROPOSAL stage.
If it gets voted down, one experimental dollar gets divided equally among the 5 members of your group so that each members gets 0.2 experimental dollars, and the following stage is a PROPOSER GROUP stage. That is, what was the proposer-group up to then is no longer, and again, all five voters of a group propose who they want to see in the proposer-group, a vote takes place etc., just like in stage 1.

After a stage is over, you will be shown how many experimental dollars you have earned for that stage.

After a round is over, each of you will be randomly re-assigned to a group of five people and each of you will be randomly assigned a new identity (“Voters 1-5").

Payment for the experiment:

We will randomly select one round to count for money, and will convert the experimental dollars into US dollars with the following exchange rate: 1 experimental dollar = $10. In addition to this, you will receive a $12 show-up fee.

Information shown to you on the screen:

During the experiment, if you are in a proposer-group stage, you will be shown a history of the proposer-group that were randomly selected as well as if they were voted up or down. If you are in an allocation stage you will shown the history of allocation-proposals that were randomly selected as well as if they were voted up or down. During an allocation-proposal stage, you will also be indicated who is in the proposer-group.

Summary:

- This experiment consists of 8 independent rounds.
- Each round is made up of 6 stages.
- After a round is over you will be randomly re-matched with 4 participants to form groups of 5 voters.
- In each stage of a round, you will either be in a *proposer-group stage* or in an *allocation-proposal stage*.
- In a *proposer-group stage* you decide on who will be part of the proposer group. One experimental dollar is divided equally among the 5 members of the group (everyone gets 0.2 experimental dollars), regardless of whether that proposal passes or not. If the proposal gets voted up, then the next stage is an *allocation-proposal stage*.
- In an *allocation-proposal stage* the members of the proposer group decide on allocations. For a given round, the exact task the members of the proposer group decide on depends on whether or not this it is the first time that they are in an allocation proposal stage.

  If a proposal gets voted up, then each member of your group gets what was offered to them, and the next stage is again an allocation proposal stage.
  If a proposal gets voted down, then one experimental dollar gets divided equally among all 5 members of your group so that each member of your group gets 0.2 experimental dollars, and the next stage is a proposer group stage: that is, what was the proposer-group up to then is no longer, and again, all five voters of a group propose who they want to see in the proposer-group, a vote takes place etc., just like in stage 1.

- *Y* will be chosen randomly and independently between 0 and 1.444 for each member of the proposer group.
- *X* is chosen randomly and independently for each round. So in each round you will have a different *X*.
- *X* will be the same for all members of your group.
- *X* will stay the same for all stages of a given round.

There are many things you can do. So what should you do? Well we don't know, if we did we wouldn't have to run an experiment! Just do what you think is best.

Do you have any questions?

If you have a question after the experiment has started, please raise your hand and I will come and answer your question.

(Online Appendix)
INSTRUCTIONS

Please turn off all cellular phones and pagers. Please remove anything on the tables other than these instructions, and the sheet of paper and pen that you were given.

This is an experiment on decision-making. If you follow the instructions closely and make good decisions, you can earn a considerable amount of money, which will be paid to you in private at the end of the session.

This experiment is composed of 8 ROUNDS. Each round is independent of the others. Each round is composed of 6 STAGES.

In this experiment you will act as voters that distribute funds between yourself and others in a series of stages. In each stage you must either decide who can make proposals or you make a proposal on how to allocate money. Proposals will be voted up or down (accepted or rejected) by simple majority rule.

ROUNDS:

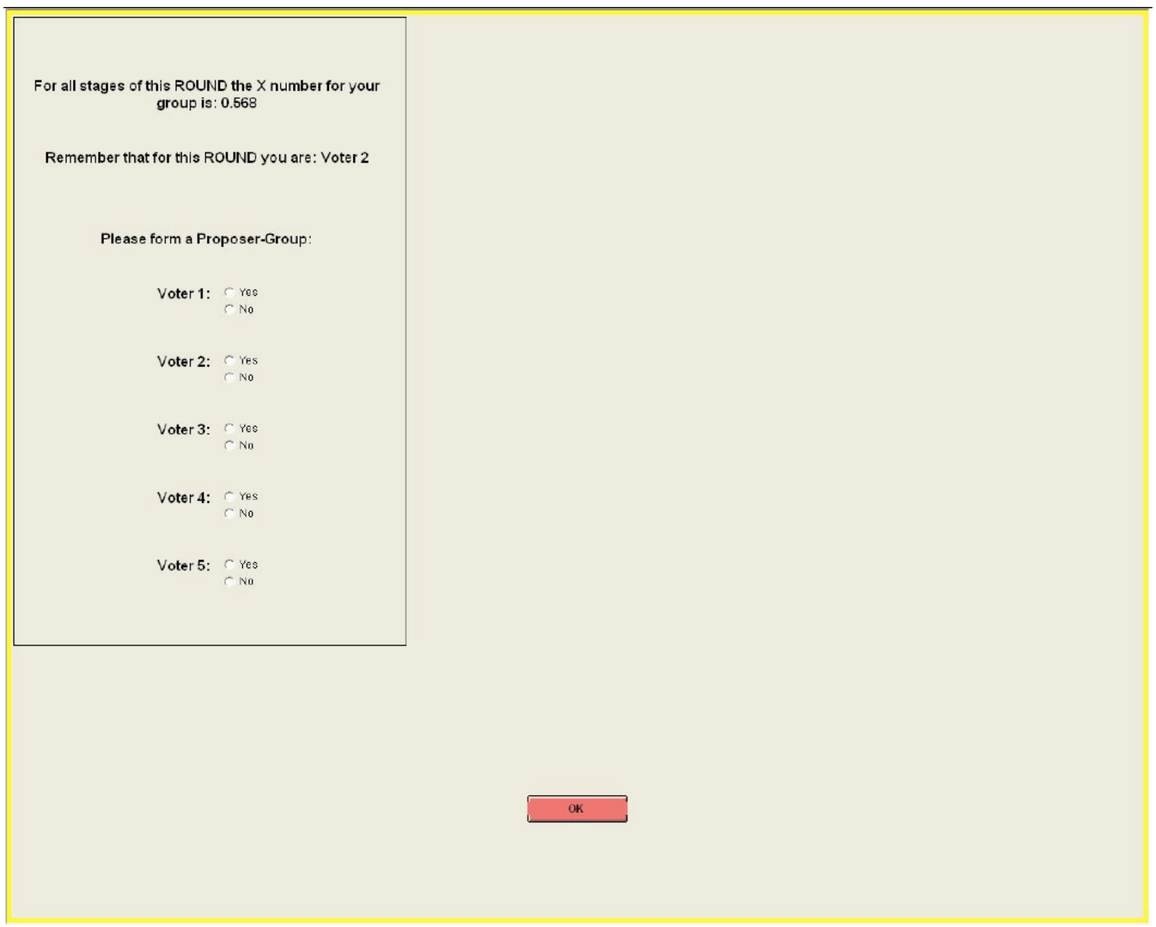
Before the first stage of a round, you will each be randomly matched with four other participants to form groups of five voters. Each group of five is independent of the others. These groups remain the same for the duration of the round.

The five members of each group will be assigned an identity: "Voter1," "Voter2," "Voter3," "Voter4" and "Voter5." You will keep this identity for the duration of the round.

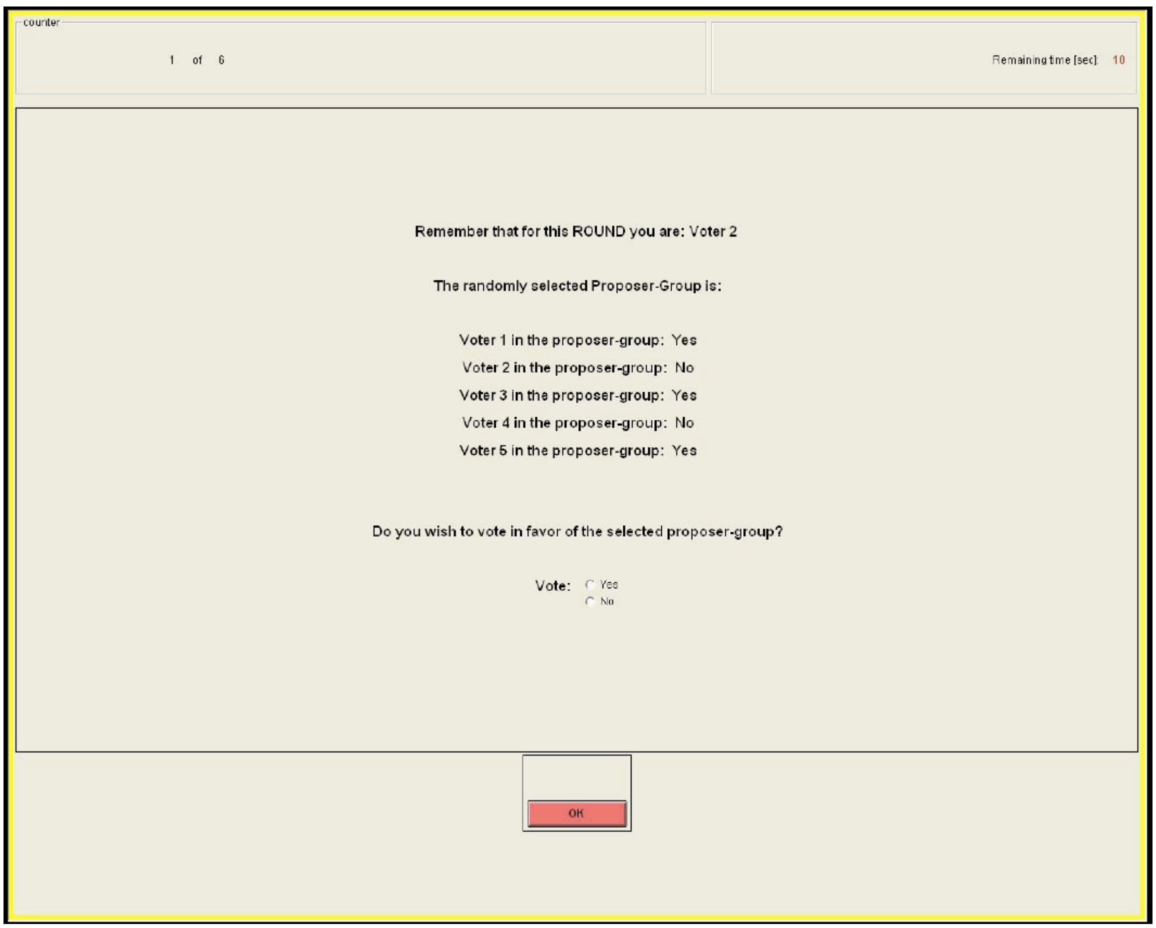
Your role in a stage will be either to determine a proposer-group (*proposer-group stages*), or to determine an allocation (*allocation-proposal stages*) – more on this below.

STAGE 1 is a *proposer-group stage*. Each of you will be asked to select who, in the group of five voters that you belong to, should be part of a proposer-group, the proposer-group is the group of voters who can make allocation proposals (more on this below). One of these 5 proposals will be randomly chosen and all five people in your group will vote on the selected proposer-group. The results of the vote will be shown to you. The selected proposer-group passes if a simple majority of people vote in favor of it (if it receives 3 yes votes or more).
As with all proposer-group stages, 1 experimental dollar will be divided equally among all five members of your group (so each person gets 0.2 experimental dollars) regardless of the outcome of the vote.

Below is a snapshot of what the screen will look like at this stage.



When it’s time to vote on the proposer groups, the screen will look like this:



<u>STAGE 2</u> can take one of two forms.

If the proposer-group was voted down (less than 3 yes votes), then STAGE 2 is a repeat of STAGE 1 (a proposer-group stage).

If the proposer-group proposal was voted up (3 or more yes votes), then STAGE 2 and all the remaining stages of this round are <u>*allocation-proposal stages*</u>.

For a given round, <u>the very first time that you are in an allocation-proposal stage</u>, just before the members of the proposer group do anything, the computer will randomly and independently choose a number *Y* between 0 and 1.444. *Y* will be chosen randomly and independently for each member of the proposer group. <u>Members of the proposer group will NOT observe *Y* at this point</u>. The members of the proposer group will have to do two things.

A. They choose how to divide 1 experimental dollar among the 5 members of the group.
B. They each choose a number *Z*. *Z* can be any number between 0 and 1.444.

Z is a cutoff value and has the following consequences: if it turns out that *Y* is greater than *Z*, then the allocation proposal for that member will be "offer everyone *Y*." If it turns out that *Y* is smaller than *Z* then the allocation proposal for that member will be to offer people amounts according to the division of the 1 experimental dollar they chose in A.

For example, say you are in the proposer group and the way you chose the experimental dollar to be divided was:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0	0.46	0.22	0.22

and you chose *Z* to be 0.11

Suppose also that the computer's *Y* value for you was 0.17
In this case, since *Y* is larger than the *Z* you chose (0.17 > 0.11), your allocation proposal will be: "offer everyone 0.17", and not the allocation in which you divided 1 dollar. If

you are the randomly chosen proposer, then the proposal that everyone will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.17	0.17	0.17	0.17	0.17

However, if *Y* had been 0.05, then your allocation proposal would be the division of the dollar since 0.05 < 0.11. If you are the randomly chosen proposer, then the proposal that everyone will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0	0.46	0.22	0.22

Let's do one more example: say you are in the proposer group and the way you chose the experimental dollar to be divided was:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0.1	0.1	0.1	0.6

and you chose *Z* to be 0.912

Suppose also that the computer's *Y* value for you was 0.72
In this case, since *Y* is smaller than the *Z* you chose (0.72 < 0.912), your allocation proposal will be the allocation in which you divided 1 dollar. If you are the randomly chosen proposer, then the proposal that all 5 members of your group will vote on is:

Voter1	Voter2	Voter3	Voter4	Voter5
0.1	0.1	0.1	0.1	0.6

However, if *Y* had been 1.26, then your allocation proposal would be "everyone gets 1.26" and not the division of 1 dollar (since 1.26 > 0.912). If you are the randomly chosen proposer, then the proposal that that all 5 members of your group will vote on is:

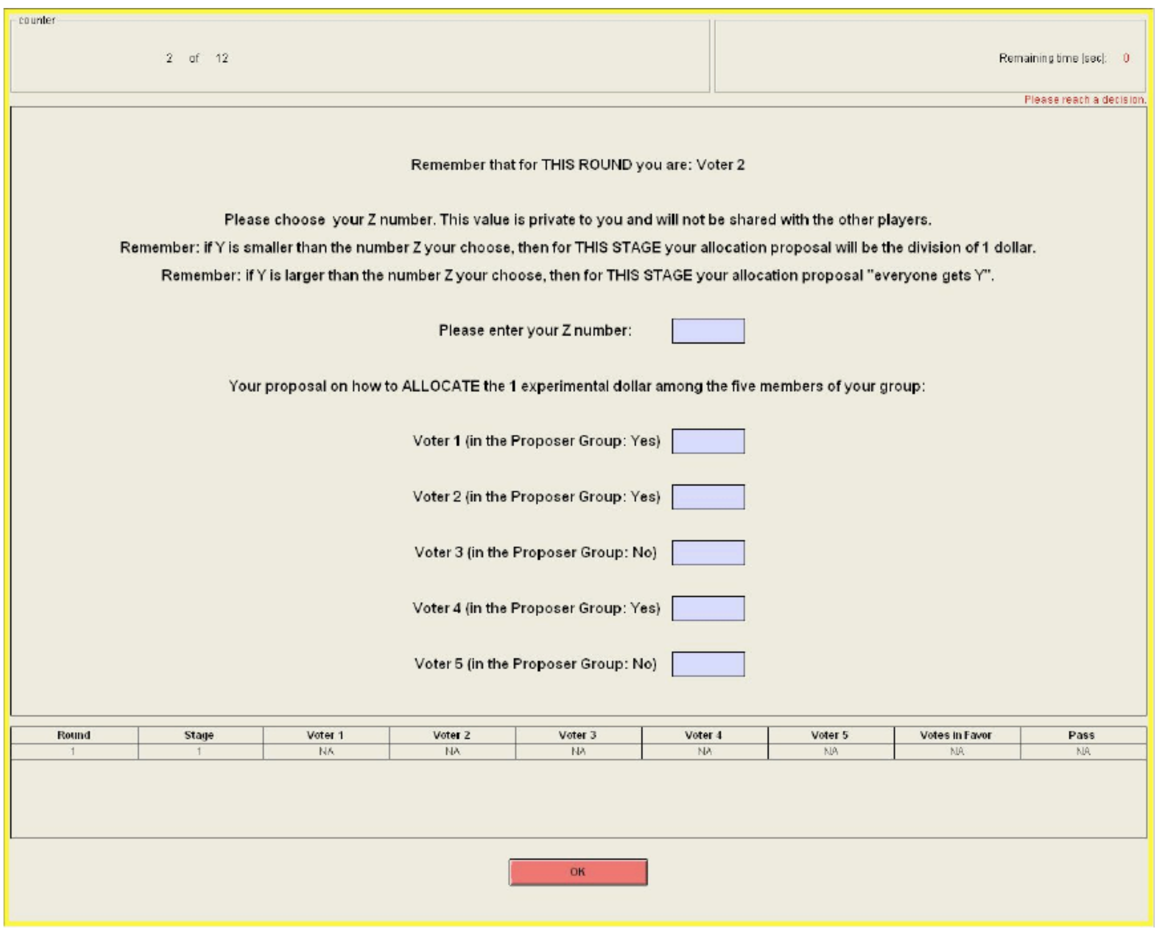
Voter1	Voter2	Voter3	Voter4	Voter5
1.26	1.26	1.26	1.26	1.26

Y is randomly chosen between 0 and 1.444.

One way you can think of Z is the following. Ask yourself: "Suppose Y is 0. Would I prefer my proposal to be "offer everyone 0" or the division of the dollar that I chose? Now suppose Y is a little bigger, say 0.001. Would I prefer my proposal to be "offer everyone 0.001" or the division of the dollar that I chose? And keep going until Y reaches 1.444: Would I prefer my proposal to be "offer everyone 1.444" or the division of the dollar that I chose. The cutoff value for which you would prefer to switch to "offer everyone Y" is the value that you should fill in for your Z number.

It is in your best interest to reveal the cutoff *Z* truthfully.

The members of the proposer group will see this screen:



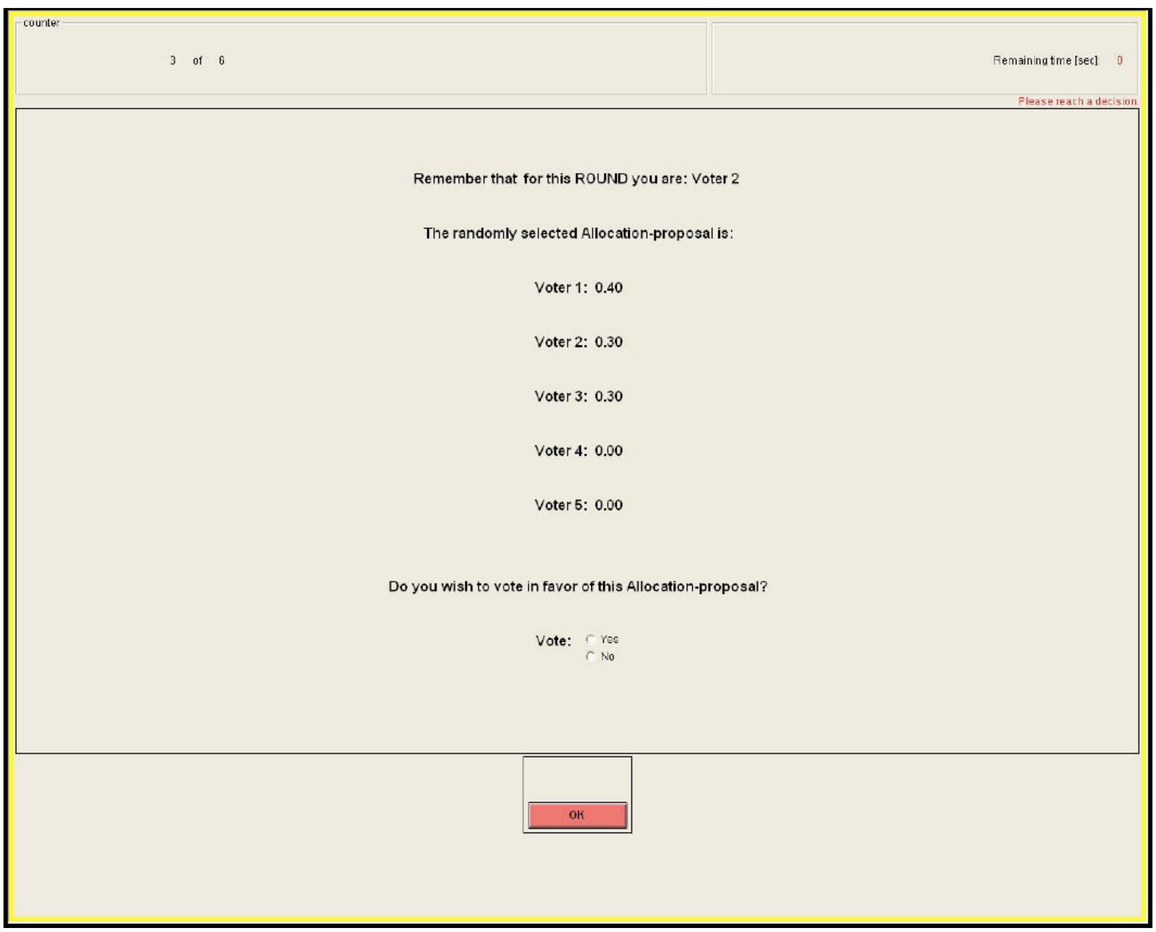
So, after all members of the proposer-group have decided on their cutoff values Z and on how to divide the 1 experimental dollar, the computer will randomly choose one proposer-group member to be the proposer for this stage. Then the computer will compare the cutoff number that that member chose (so that member's *Z* number) and the *Y* value that was randomly chosen for that member.

If *Y* is smaller than *Z* then the proposal that all 5 members of the group have to vote on is the division of the one experimental dollar. Nobody, aside from the proposer for that round, will find out what his or her *Z* was, and nobody will know what Y was.

If *Y* is greater than *Z* then the proposal that all 5 members of the group have to vote on is “everyone gets *Y*”. Still, nobody other than the proposer will know what his or her cutoff *Z* was.

If a proposal gets voted up, then the members get what was offered to them. If it gets voted down, one experimental dollar gets divided equally among the 5 members of your group so that each members gets 0.2 experimental dollars.

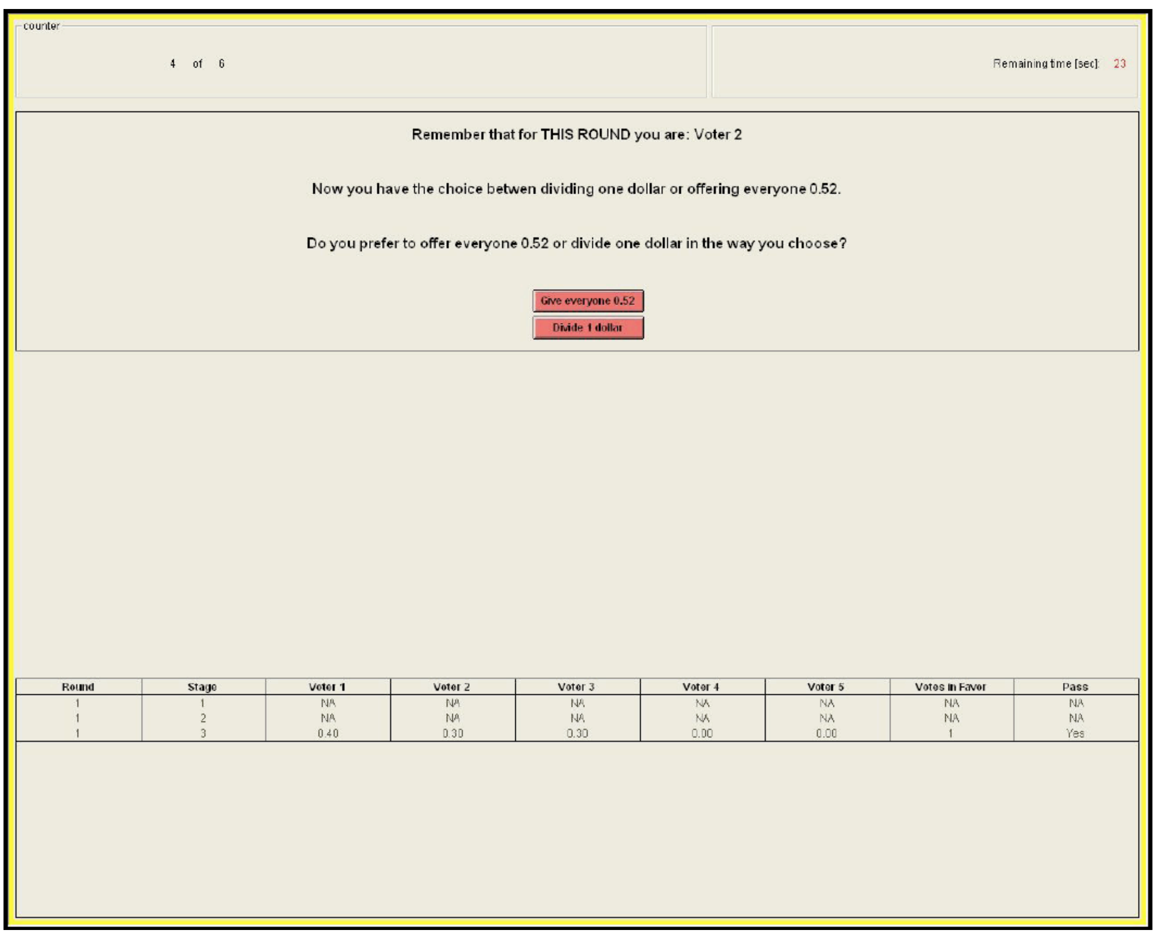
The voting stage will look something like this:



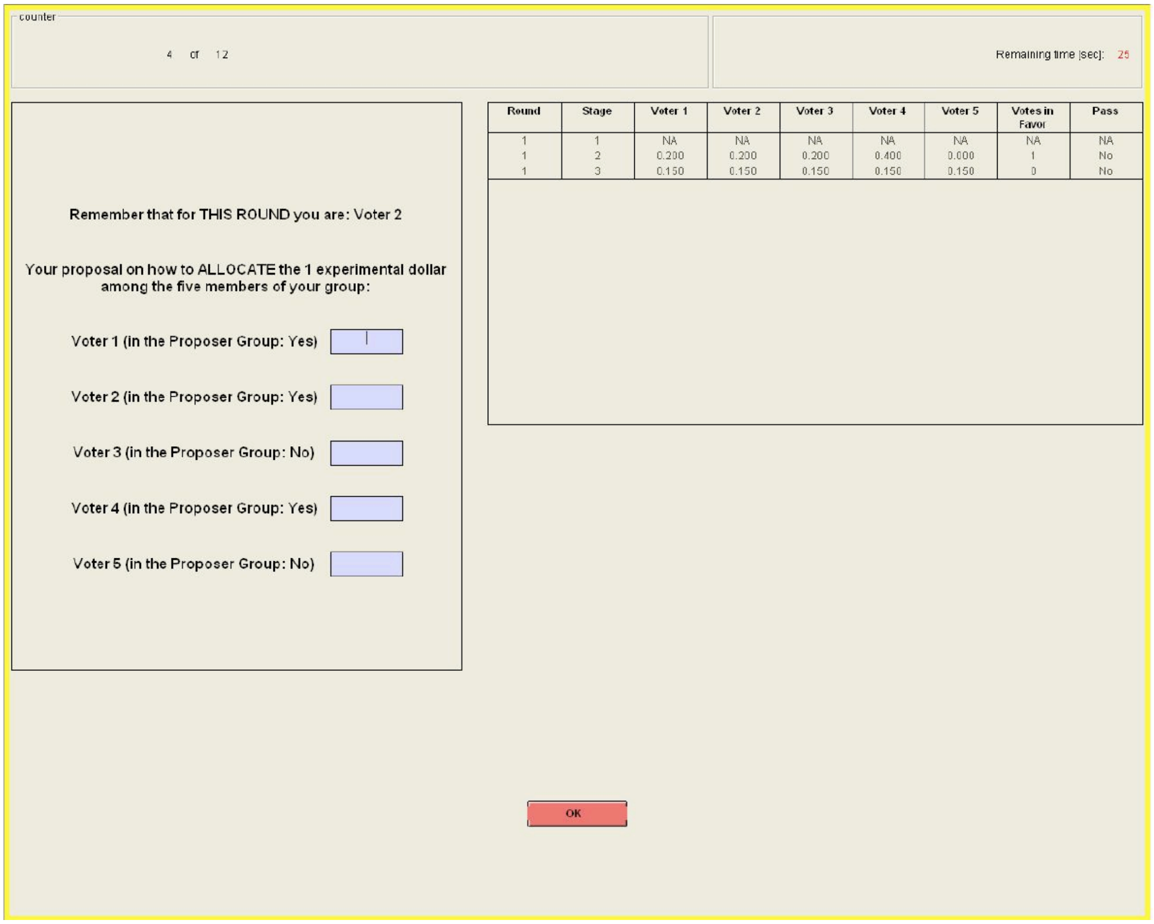
The above was about what happens in the very first allocation-proposal stage. All following allocation-proposal stages are described below.

For a given round, in allocation proposal stages after the first one, the members of the proposer group will have to choose an allocation-proposal. They have the choice between two options. The first is offer *X* to everyone. *X* is revealed to you at the beginning of the round and stays the same for all stages of that round. *X* is the same for all members of your group. The second is to choose how to divide one experimental dollar among the 5 members of the group. After all members of the proposer group have chosen between those two options, the computer randomly chooses one member in the proposer group, and it is his/her proposal that gets voted on.

The members of the proposer group will see something like the following screen:



Those who choose to divide the one experimental dollar will then see something like this screen:



If a proposal gets voted up, then the members get what was offered to them. If it gets voted down, one experimental dollar gets divided equally among the 5 members of your group so that each members gets 0.2 experimental dollars.

Regardless of whether an allocation-proposal is voted up or down, the proposer-group remains the same until the end of the round.

After a stage is over, you will be shown how many experimental dollars you have earned for that stage.

After a round is over, each of you will be randomly re-assigned to a group of five people and each of you will be randomly assigned a new identity ("Voters 1-5").

Payment for the experiment:

We will randomly select one round to count for money, and will convert the experimental dollars into US dollars with the following exchange rate: 1 experimental dollar = $10. In addition to this, you will receive a $10 show-up fee. To calculate the number of experimental dollars you have earned in each round, we will simply sum up all the experimental dollars that you have earned for each stage of that round.

Information shown to you on the screen:

During the experiment, if you are in a proposer-group stage, you will be shown a history of the proposer-groups that were randomly selected as well as if they were voted up or down. If you are in an allocation stage you will shown the history of allocation-proposals that were randomly selected as well as if they were voted up or down. During an allocation-proposal stage, you will also be indicated who is in the proposer-group.

Summary:

- This experiment consists of 8 independent rounds.
- Each round is made up of 6 stages.
- After a round is over you will be randomly re-matched with 4 participants to form groups of 5 voters.
- In each stage of a round, you will either be in a *proposer-group stage* or in an *allocation-proposal stage*.
- In a *proposer-group stage* you decide on who will be part of the proposer group. One experimental dollar is divided equally among the 5 members of the group (everyone gets 0.2 experimental dollars), regardless of whether that proposal passes or not. If the proposal gets voted up, then all the next stages are *allocation-proposal stages*.
- In an *allocation-proposal stage* the members of the proposer group decide on allocations. For a given round, the exact task the members of the proposer group decide on depends on whether or not this it is the first time that they are in an allocation proposal stage.

  If a proposal gets voted up, then each member of your group gets what was offered to them. If a proposal gets voted down, then one experimental dollar gets divided equally among all 5 members of your group so that each member of your group gets 0.2 experimental dollars.

  Regardless of if an allocation proposal gets voted up or not, the members of the proposer group stays the same for the duration of the round.

- *Y* will be chosen randomly and independently between 0 and 1.444 for each member of the proposer group.

- *X* is chosen randomly and independently for each round. So in each round you will have a different *X*.
- *X* will be the same for all members of your group.
- *X* will stay the same for all stages of a given round.

There are many things you can do. So what should you do? Well we don't know, if we did we wouldn't have to run an experiment! Just do what you think is best.

Do you have any questions?

If you have a question after the experiment has started, please raise your hand and I will come and answer your question.

Appendix 8: Probit regression: treatment effect on offering the public good

These regressions use data only from those proposals that made it to the floor for a vote. Table 5 shows the results of such regressions. The dependent variable y_i is equal to 1 if the public good was proposed and zero otherwise. In Regression I the independent variables are a dummy equal to 1 for the treatment with a vote of confidence procedure and the value of the public good. Regression II adds the interaction of these two variables as a regressor. The difference between the two regressions is that in the second, the Vote of Confidence Procedure variable is statistically significant only when interacted with the value of the public good. This is expected given Fig. 2: in both treatments low values of the public good are rejected. The vote of confidence procedure only impacts members' choices when they are faced with relatively higher values of the public good.[57]

[57] Recall that for our parameterization, the public good should not be offered in either treatment. In the theory, however, as the public good value rises and passes a certain threshold, we expect it to be offered only in the case where there isn't a vote of confidence procedure. Indeed, for public goods valued beyond (n + 1)/2n (which is .6 in this experiment), the public good should always be offered without a vote of confidence procedure, while with a vote of confidence procedure it may be offered only in the last period (so long as the value is not much higher—see Theorems 2.1 and 2.2). In this sense, the vote of confidence procedure should only impact offering the public good for high values of the public good. Strictly speaking, in order to test this theory, a dummy for public goods beyond .6 should be used. Because subjects offer the public good for values far below that (for values above .38 the proportion of public good offering is almost 100 % as can been seen in Fig. 2), the regression here uses the magnitude of the public good as a regressor, as if subjects made errors in their calculations.