

Referees' Supplemental Appendix to

**Learning from Debate:  
Institutions and Information**

Sample Instructions to Subjects  
(UUS-Simultaneous Treatment)

## Instructions

### **Introduction**

This is an experiment on decision making. In the following experiment you will make a series of choices. At the end of the experiment, you will be paid depending on the choices that you made during the experiment and the choices made by other participants. If you follow the instructions and make appropriate decisions, you may make an appreciable amount of money.

The experiment will consist of **20** rounds. During the course of the experiment, you will have the opportunity to earn “tokens.” At the end of the experiment, **3** of the **20** rounds will be selected at random by the computer. Your payment for the experiment will be determined by the choices made by you and other participants in those rounds (and those rounds only). At the end of the experiment, the tokens from the selected **3** rounds will be converted into dollars at the rate of:

$$\underline{100} \text{ tokens} = \underline{7} \text{ dollars}$$

At the beginning of each round, you will be randomly assigned into a group of three people, and each person within the group will be randomly assigned one of the following three roles: Sender 0, Sender 10, or Receiver. As such, over the course of the experiment, you will be interacting with different groups of people, and taking on the different roles of Sender 0, Sender 10, and Receiver. All of your interactions with others will take place anonymously through computer terminals, so your personal identity will never be revealed to others and you will never know who is in your group in any particular round.

In each round, every member of the group will have – but will not necessarily know – what we will call his or her *true number*, which affects his or her payoffs in that round. Each round begins with a *communication phase*, during which Senders choose what message to send to the Receiver. After the communication phase, the Receiver must choose a whole number (that is, no fractions) between 0 and 10.

- A *Receiver's* payoff will depend on how close his or her choice is to his or her true number. The closer the Receiver's choice is to his or her true number, the higher his or her payoff will be in that round.
- A *Sender's* payoff will depend on (1) the choice made by the Receiver and (2) how close that choice is to the Sender's own “true number.” The closer the Receiver's final choice is to the Sender's own true number, the higher the Sender's payoff will be in that round.

### **(1) Initial Information About True Numbers**

In each round of the experiment, Sender 0 always has a true number of 0, while Sender 10 always has a true number of 10. The Receiver will also have a true number that is either 0 or 10. But, in contrast to the Senders' true numbers, nobody, including the Receiver, will be told what the Receiver's true number is. Moreover, the Receiver's true number can vary from one round to the next. Specifically, in every round, the computer randomly chooses either 0 or 10 to be the Receiver's true number. The computer is equally likely to choose 0 or 10 in each round.

### **(2) Communication**

During the communication phase of each round, each Sender will make a choice of whether to send a message consisting of his or her true number – that is, a message of 0 for Sender 0, and a message of 10 for Sender 10 – or to send an empty message.

The two Senders will make their choices simultaneously. Both Senders and the Receiver will see feedback on those choices. This feedback refers to the choice made by “the First Sender” and “the Second Sender.” The nature of the feedback is the same for each round in the session – however, whether Sender 0 or Sender 10 gets to be “the First Sender” or “the Second Sender” in a given round is random. That is, in any given round, there is a 50% chance that the computer will randomly select Sender 0 to be “the First Sender,” and a 50% chance that the computer will randomly select Sender 10 to be “the First Sender.”

Both Sender 0 and Sender 10 will always be told which of them will be “the First Sender” and which of them will be “the Second Sender.” However, the Receiver will not be given this information. When the Receiver gets a message from a Sender, he or she will only be told that the message came from “the First Sender” or from “the Second Sender” – that is, he or she will not be told whether the message came from Sender 0 or Sender 10.

We will now describe in detail the steps in the communication phase in each round.

#### STEP A: Choices by the Senders

The First Sender and the Second Sender simultaneously make their choice during Step A. “*Step A: Choice by the First Sender*” and “*Step A: Choice by the Second Sender,*” the first two pages in your Screenshots Handout, show what this looks like for the First Sender and the Second Sender.

#### STEP B: Feedback

Following the choices by the Senders, the Receiver and both Senders get some feedback about those choices. However, the nature of this feedback is different for the Receiver than it is for the Senders.

*Feedback For the Receiver:* What the Receiver actually sees as a result of communication from each Sender depends not only on each Sender’s choice, but also on the Receiver’s actual true number. Specifically:

- if a Sender sends a message that *matches* the Receiver’s true number, the Receiver sees the actual message sent by the Sender.
- if a Sender sends a message that *does not match* the Receiver’s true number, the Receiver is told that he or she has received an “unmatched message.”
- if a Sender sends empty message, then the Receiver sees “empty message” as the result of communication.

For example, suppose that Sender 10 has been assigned to be “the First Sender” and Sender 0 “the Second Sender.” If Sender 10 chooses to send his or her true number, and if the Receiver’s true number happens to be 10, then the Receiver will be told that he or she has received the message “10” from “the First Sender.” If Sender 10 chooses to send his or her true number, but instead the Receiver’s true number happens to be 0, the Receiver will be told that he or she has received an “unmatched message” from “the First Sender.” Finally, if Sender 10 chooses to send an empty message instead of “10”, then the Receiver will be told that he or she has received an “empty message” from “the First Sender,” regardless of his or her true number.

*“Step B: Feedback for the Receiver,” the third page in your Screenshots Handout, shows what this looks like for the Receiver.*

*Feedback For Senders:* Both Senders see explicitly on their screens the exact choices made by both Senders – that is, “0,” “10,” or “empty message.” In addition, Senders will see exactly what the Receiver saw as a result of communication by each Sender in Step A: the Sender’s true number, an “unmatched” message, or an “empty message.” *“Step B: Feedback for Senders,” the fourth page in your Screenshots Handout, shows what this looks like for Senders.*

The communication phase ends once the Senders and the Receiver have reviewed this feedback.

### **(3) Final Choices and Payoffs**

Once the communication phase is complete, the Receiver will be asked to choose a whole number between 0 and 10. *“Final Choice Screen,” the fifth page in your Screenshots Handout, shows what this looks like for the Receiver.*

This choice by the Receiver will determine the number of tokens earned both by Senders and by Receivers for the round.

The number of tokens you earn in a given round will be tied to what we will call your penalty in that round. In particular, the number of tokens you will earn will be **100-(your penalty)**. This means that you earn *more* tokens, the *lower* your “penalty” is for that round.

- If you are the **Receiver** in a given round, your penalty for the round will be the *square* of the “distance” between your true number and your own choice. This means that you minimize your penalty when your choice is as close as possible to your true number. It also means that each 1 point move of your choice away from your true number will be penalized more severely the farther away from your true number that choice is. For example, if the distance between your true number and your final choice is 3 points, then your penalty is the square of that, i.e., 9. If the distance between your true number and your choice increases by 1 point to 4, then your penalty increases by 7 points, to 16. If the distance increases again by 1 point, from 4 to 5, then the penalty increases again but by a greater amount – this time, by 9 points, to 25.

If the distance between your true number and your choice is 0, then you earn 100 tokens for the round. If that distance increases to 5, then you earn only 75 tokens for the round. If that distance increases to 10, then you earn 0 tokens for the round. Remember that if a given round is randomly chosen as one of the **3** rounds for payment, the tokens will be converted into dollars at a rate of 100 tokens to **7** dollars.

- If you are a **Sender** in a given round, your penalty will depend on the choice made by the Receiver. In particular, your penalty will be the *square* of the distance between your true number and the Receiver’s choice. This means that your penalty is smaller, the closer the Receiver’s choice is to your own true number. It also means that, as in the case of the Receiver’s own penalty, each 1 point move of the Receiver’s choice away from your true

number will be penalized more severely the farther away from your true number that choice is.

#### **(4) End-of-Round Feedback**

Both Senders and the Receiver receive feedback at the end of the round. *“Feedback Screen for Senders”* and *“Feedback Screen for the Receiver,”* the last two pages of your *Screenshots Handout*, show what this feedback looks like. Both the Senders and the Receiver learn the number of tokens earned for the round, observe the Receiver’s choice, and observe what the Receiver saw on his or her screen following the Senders’ choices. In addition, the Receiver learns whether Sender 0 or Sender 10 was the First Sender for the round.

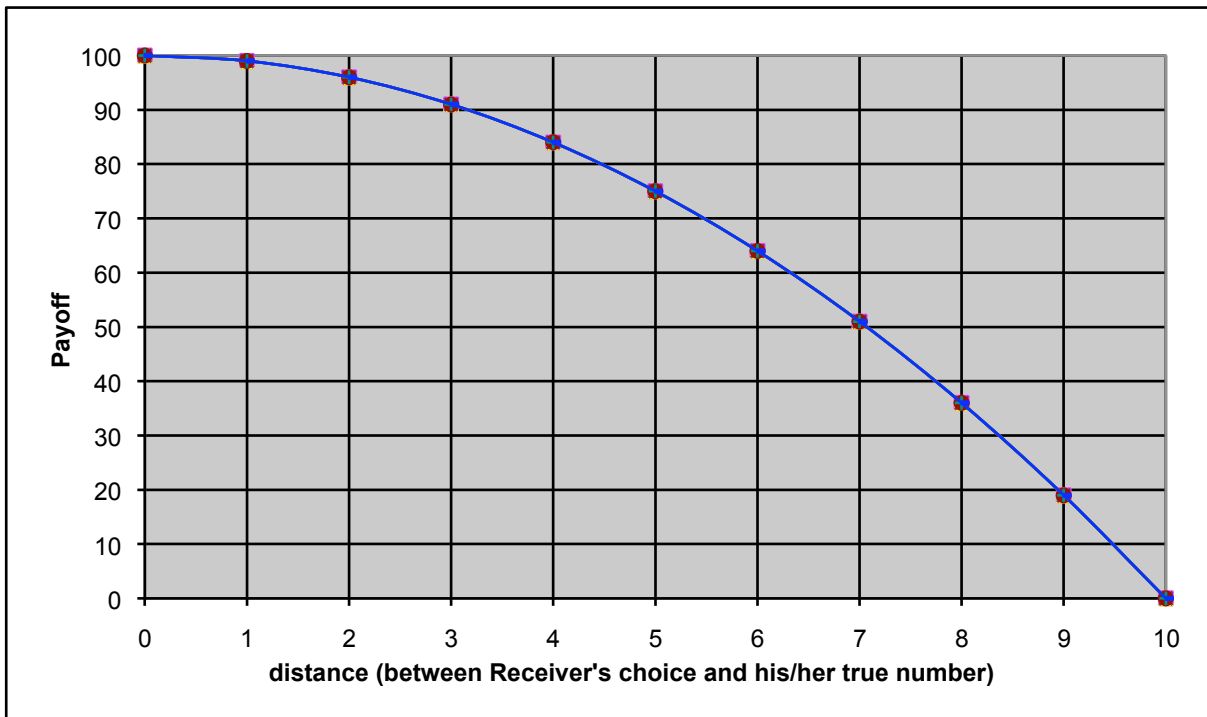
#### **Overall Payoffs**

Your total payment for participation in the experiment will consist of the sum of your earnings from the 3 rounds randomly selected for payment, plus the show-up fee of \$5.00. Remember, you will be randomly reassigned to a group and to a role at the beginning of each round. Also remember that Sender 0 and Sender 10 are equally likely to be selected as the First Sender in every round.

If you have any questions, please ask them at this time.

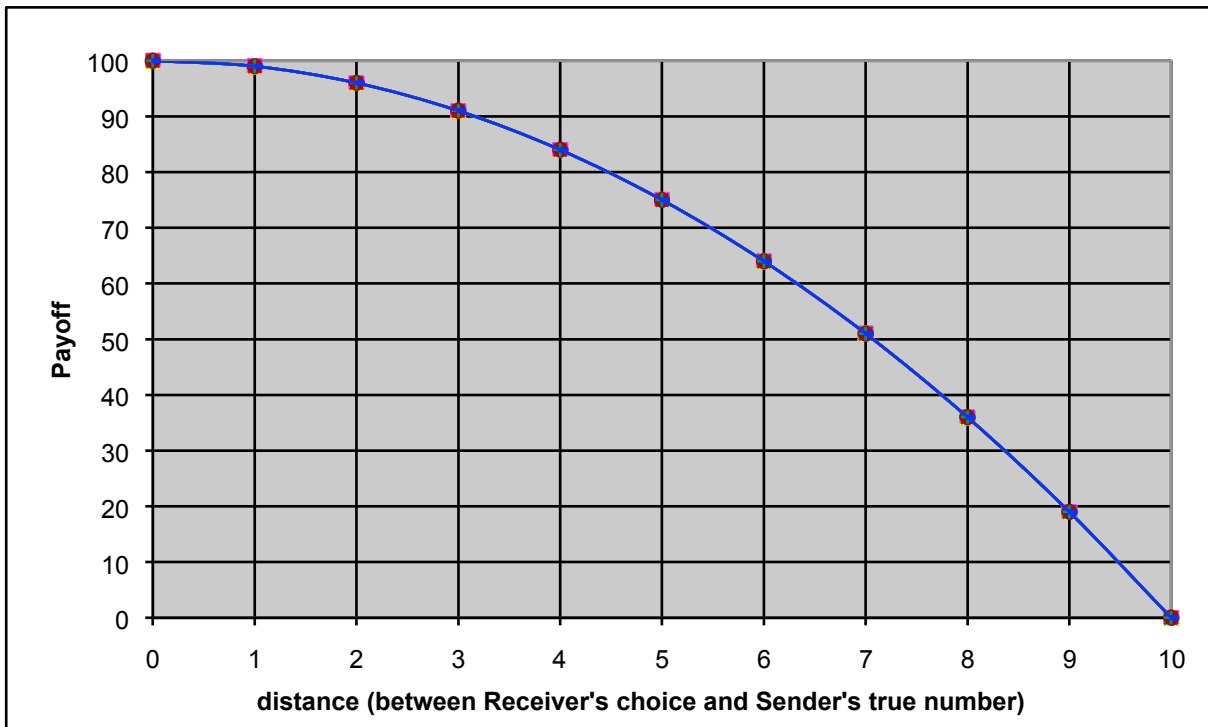
***Table 1. Payoff Table for Receivers (payoffs in tokens)***

<b>Distance (between Receiver's choice and his/her true number)</b>	<b>Penalty equals Squared distance</b>	<b>Payoff</b>
0	0	100
1	1	99
2	4	96
3	9	91
4	16	84
5	25	75
6	36	64
7	49	51
8	64	36
9	81	19
10	100	0



**Table 2. Payoff Table for Senders (payoffs in tokens)**

Distance (between Receiver's choice and Sender's true number)	Penalty equals Squared distance	Payoff
0	0	100
1	1	99
2	4	96
3	9	91
4	16	84
5	25	75
6	36	64
7	49	51
8	64	36
9	81	19
10	100	0



## Step A: Choice by the First Sender

STEP A: A new round of the experiment has now begun.

You are Sender 10. Your true number is 10.  
This round, you are the First Sender.  
The true number of Sender 0 is 0.

Make a choice concerning communications with the Receiver:

- 10
- empty message

OK



## Step A: Choice by the Second Sender

STEP A: A new round of the experiment has now begun.

You are Sender 0. Your true number is 0.

This round, you are the Second Sender.

The true number of Sender 10 is 10.

Make a choice concerning communications with the Receiver:

- 0
- empty message

OK

## Step B: Feedback for the Receiver

STEP B

You are the Receiver.

The result of communication from the First Sender is empty message

The result of communication from the Second Sender is unmatched

(This information will not reappear until after you make your final choice. You may wish to make a note of it on your scratch paper.)

Please click OK to continue.

OK

## Step B: Feedback for Senders

### STEP B

You are Sender 10. This round, you are the First Sender.

The First Sender made the following communication choice: empty message

The Receiver observed the following result of communication: empty message

The Second Sender made the following communication choice: 0

The Receiver observed the following result of communication: unmatched

(This information will not reappear. You may wish to make a note of it on your scratch paper.)

The Receiver is now reviewing the communications he or she has received. Please click OK to continue.

OK

## Final Choice Screen

FINAL CHOICE SCREEN

You are the Receiver.

Communication has come to an end for the round.

Now enter a value for your Choice here:

OK

## Feedback Screen for Senders

### END-OF-ROUND FEEDBACK SCREEN

You are Sender 10. This round, you are the First Sender.

Your true number is 10

The true number of Sender 0 is 0

The Receiver chose 5

The distance between this choice and your true number was: 5

Your penalty for this round was therefore 25

Your payoff for this round is  $100 - 25 = 75$  tokens.

Here are the communications seen by the Receiver over the course of this round:

### COMMUNICATIONS SEEN BY RECEIVER

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empty message from the First Sender

unmatched from the Second Sender

Please click OK to continue.

OK

## Feedback Screen for the Receiver

### END-OF-ROUND FEEDBACK SCREEN

You are the Receiver.

This round, the First Sender was Sender 10.  
This round, the Second Sender was Sender 0.

Your individual choice was	5
Your true number was	10
The distance between your true number and your choice was	5
Your penalty for this round was therefore	25

Your payoff for this round is  $100 - 25 = 75$  tokens.

Here are the communications you saw over the course of this round:

### COMMUNICATIONS SEEN BY RECEIVER

---

empty message from the First Sender

unmatched from the Second Sender

Please click OK to continue.

OK