

Coordination and Learning in Dynamic Global Games: Sample Instructions

The following instructions are translated from original German for the No-New-Information/
New Information Session.

Instructions for the experiment

You are now participating in an economic experiment. Please read the following instructions carefully, paying attention to details. You will receive all the information you require for participation in the experiment. If you do not understand something, please raise your hand. We will answer your question at your desk.

Communication between participants is absolutely forbidden during the experiment! Not obeying this rule will lead to immediate exclusion from the experiment and all payments. If you have a question during the experiment, please raise your hand.

Your payment in this experiment will be calculated in points at first. The total point score you earn during the experiment will be converted to US Dollars at the end of the experiment. The following exchange rate applies in this case:

$$10 \text{ points} = 25 \text{ centimes}^1$$

You will receive the amount of points you earned during the experiment plus 15 Swiss Francs for appearing in **cash**.

The experiment consists of **20 rounds**; each round consists of one or two decision stages.

You are one of **15 people** who interact with each other during the experiment. In the first stage of each round, you must choose either action A or B, based on the information available to you. If there is a second stage in a round, you will again have to decide choose either action A or B.

Income

You must choose either action A and action B in every stage of every round.

- ◆ If you choose action A, you will incur a **cost of 60 points** and you will earn a **gross income of either 100 or 0 points**, depending whether action A is successful or not.
 - If action A is **successful**, you will earn an income of $100 - 60 = 40$ points
 - If action A is **not successful**, you will incur a loss of $0 - 60 = -60$ points.

Again, whether action A is successful or not depends on whether more than Y% of the 15 people chose action A.

¹ Translator's note: Exchange rate in June 2006: 1 Swiss Franc = 0.81 U.S. Dollars

- ◆ If you choose action B, you will neither incur costs nor earn an income, independent of what others have chosen. Your income from B is thus always 0.

If action A is successful in the first stage (i.e., enough of the 15 other people chose it), the round will end and the next one will begin. If action A was not successful in the first stage (i.e., less than Y% of the other 15 people selected it), the round will continue into the second stage. In the second stage, each of the 15 participants must again choose either action A or B. The round always ends after stage 2, at which point the next round begins (20 rounds in total). Losses, which may occur if action A is unsuccessful, will be financed by the income from other rounds or, if necessary, from the show up-fee of 15 Swiss Francs.

What determines whether action A is successful or not?

The number Y dictates the minimum percentage of people that need to choose action A for action A to be successful. The number **Y is randomly determined in each round and remains fixed for the duration of each round.** If, for example, Y is 60, then at least 60% of the 15 people (i.e. at least 9 people) must choose action A for it to be successful. In this case, all who choose action A earn an income amounting to $100 - 50 = 50$ points. If fewer than 60% select A (8 people or fewer), A will be unsuccessful. In this case, all who choose A will incur a loss amounting to 50 points ($0 - 50 = -50$).

The computer selects the number Y at the beginning of each round from a normal distribution with an average value of 65 and a standard deviation of 50. This means that the **average value** of Y is 65, but the number Y drawn may deviate from the average value in a round. Positive and negative deviations from the number 75 are equally probable. The distribution (standard deviation) of the number Y was chosen in such a way that there is approximately a 33% probability that Y lies between 20 and 75 and an equal probability of approximately 33% that Y lies between 75 and 120. For reasons of simplicity, the number Y selected is rounded to one decimal point.

Please note that Y can also take on a negative value. In this case, a single individual suffices to make action A successful. Y can also exceed 100. In this case, action A is never successful, even if all 15 people (i.e. 100%) choose action A. The attached information sheet shows the minimum number of people needed to choose A in order for A to be successful.

Information Your Private Hint Number

You do not know how large Y is when you make your decision. You only know that Y has an average value of 75 and a distribution of 55.

Instead, you will receive a **private hint number x** that gives you information about the value of Y. The private hint number x is given in the form of $x = Y + z$, where z is a normally distributed random variable with an average value of 0 and a standard deviation of 10. **On average, the private hint number x accurately reflects the value of Y, because the value of the random variable z is zero on average.** However, in any given situation, the hint number can differ from Y. **In particular, there is approximately 67% probability that Y lies within ± 10 of your hint number x.**

Example 1: You receive a private hint number of 24.5. There is thus a probability of approximately 67% that the unknown random number Y lies within ± 10 of your private hint number (i.e., there is 67% probability that Y lies between 14.5 and 34.5).

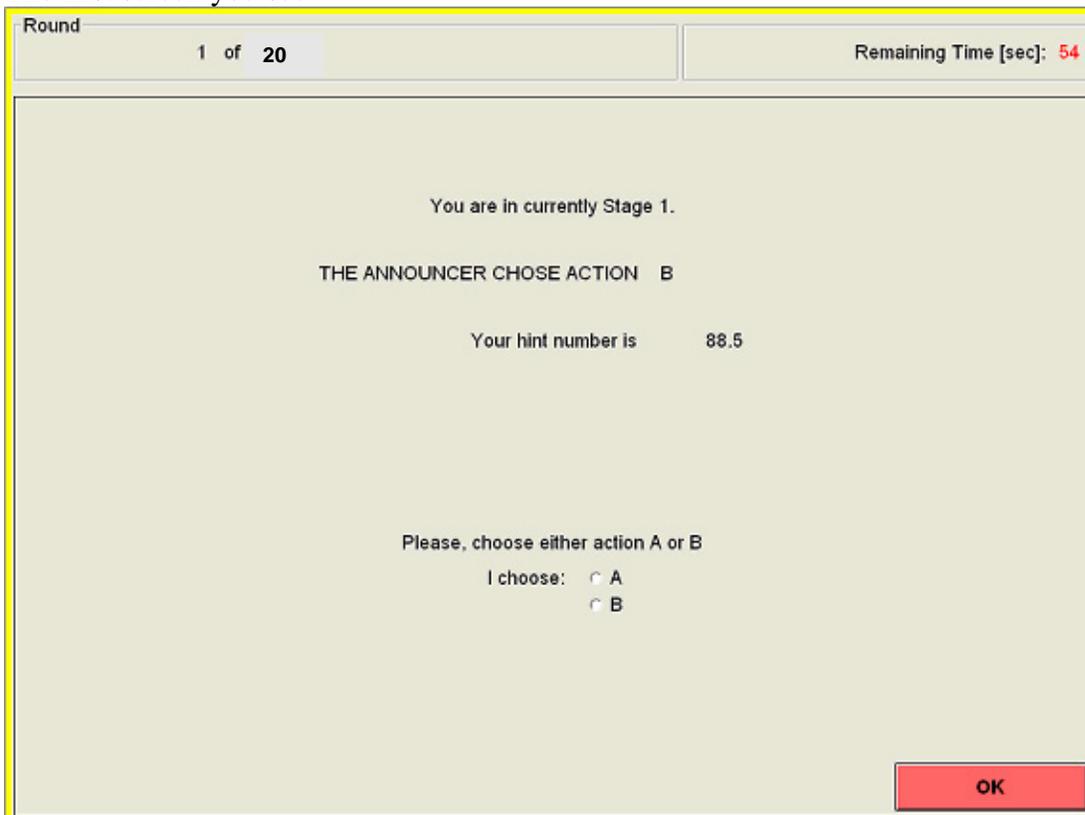
Example 2: You receive a private hint number of 62.8. There is a 67% probability that Y lies between 52.8 and 72.8.

Exact procedure in stage 1 of a round

The computer first draws the random number Y. The random number is the same for all participants. Next, a private hint number is given to each of the other 15 participants. Since the private hint numbers vary around the true value of Y, each of the 15 participants usually receives a different private hint number. However, there is always a 67% probability that the true value of Y lies within the interval of ± 10 of the private hint number.

Each of the 15 participants then decides whether to choose action A or B. The decision is entered on the decision screen (see the next page for the example). When you have made your decision, please press the OK button. You can revise your decision until you press the OK button.

The first screen you see:



Round 1 of 20 Remaining Time [sec]: 54

You are in currently Stage 1.

THE ANNOUNCER CHOSE ACTION B

Your hint number is 88.5

Please, choose either action A or B

I choose: A B

OK

After all the 15 people have decided, each is asked on a new screen about his or her assessment of the frequency of action A.

The next screen will contain relevant information. If action A is successful, each of the 15 participants will be informed about how many people chose action A, the fact that action A was successful, the actual value of the random number Y, and the income in the round. If action A was not successful, each of the 15 participants will be informed that action A was not successful, that the round will continue into the second stage, and each will learn the income in the first stage.

The information screen in Stage 1

The screenshot shows a software interface for a game. At the top, there are two boxes: 'Round 1 of 20' and 'Remaining Time [sec]: 50'. The main area contains the following text: 'Information for Stage 1', 'You chose action A', 'Action A was not successful; the round will continue into Stage 2.', and 'Your Income in Stage 1 is -60.00'. A 'next screen' button is located in the bottom right corner.

The exact procedure in stage 2 of a round

If action A was not successful in the first stage, the 15 participants will **not** be informed of actual value of Y, but will be reminded of the hint number they received in the first stage. Then, the 15 participants must again decide between actions A and B. The rules of this stage are otherwise identical to those in the first stage.

The calculation of income in stage 2 is exactly the same as that in stage 1. Individuals who opt for action B neither earn an income nor incur a cost. Those who opt for action A earn an income of $100 - 60 = 40$ points, if action A is successful, and an income of $0 - 60 = -60$ points, if action A is not successful.

Another information screen appears at the end of stage 2 that informs you about the following (please, refer to the screen on the next page):

- Your income in stage 1
- Number of people who chose action A in stage 2

- The random number Y in this round
- Whether action A was successful in stage 2
- Your income in stage 2
- Your total income in this round

The information screen in Stage 2

Round	1 of 20	Remaining Time [sec]: 47
Complete Information after Stage 2		
You chose action A in Stage 2		
Your income in Stage 1 was		-60.00
The total number of people who chose action A in Stage 1 was		10
The total number of people who chose action A in Stage 2 was		12
The random number was		76.2
In Stage 2, action A was successful.		
Your income in Stage 2 is		40.00
Your total income in this round is		-20.00
		next screen

A new round then begins; the computer first draws a new random number Y. You will then receive a new private hint number based on the new random number Y, which will give you information about Y.

The incomes stemming from each round will be added up at the end of the experiment. In addition to the show-up fee, this will constitute your entire income for the experiment. Losses that might result from individual rounds will be funded by means of income from other rounds or, if necessary, from the show-up fee of 15 Swiss Francs.

Control questions

Please answer all of the following questions. If you have any questions, please raise your hand!

1. The random number Y has the value of -3.4 . How many people must choose action A for A to be successful?

At least _____ people must choose A.

2. The random number Y has the value of 34.2 . How many people must choose action A for A to be successful?

At least _____ people must choose A.

3. The random number Y has the value of 105.0 . How many people must choose action A for A to be successful?

At least _____ people must choose A.

4. Your private hint number is 16.4 . Find the interval around your private hint number within which the random number Y lies with a probability of 67% .

The interval around my private hint number is _____

5. Your private hint number is 48.1 . Find the interval around your private hint number where the random number Y lies with a probability of 67% .

The interval around my private hint number is _____

6. The random number Y is 63.1 , and your private hint number is 56.4 . Assume you choose action A at stage 1 of this round. Four other people also select action A.

a) How much do you earn at stage 1 of this round? I earn _____ points.

b) You again choose action A at stage 2 and 9 other people also choose action A. How much do you earn at stage 2 of this round?

I earn _____ points in stage 2.

7. The random number Y is 63.1 , and your private hint number is 56.4 . Assume you choose action B at stage 1 of this round. Four other people select action A.

a) How much do you earn at stage 1 of this round? I earn _____ points.

b) You then choose action B at stage 2 and 10 other people choose action A. How much do you earn at stage 2 of this round?

I earn _____ points in stage 2.

8. The random number Y is 63.1, and your private hint number is 56.4. Assume you choose action B at stage 1 of this round. Four other people select action A.

a) How much do you earn at stage 1 of this round? I earn _____ points.

b) You then choose action A at stage 2 and 10 other people choose action A. How much do you earn at stage 2 of this round?

I earn _____ points in stage 2.

Information sheet

The random number Y indicates the minimum percentage of people who must choose action A in order for action A to be successful. The following table shows how many people must choose action A in order for action A to be successful, if the random number assumes certain values.

In order to understand the table, you should keep in mind that 1 of 15 participants represents 6.6%, 2 of 15 participants represent $2 \times 6.6\% = 13.3\%$, etc.

The right column shows the minimum number of participants who must choose action A for action A to be successful. The left column shows the corresponding intervals for the random number Y.

IF THE UNKNOWN NUMBER Y LIES IN THE FOLLOWING INTERVAL:	THE FOLLOWING MINIMUM NUMBER OF THE 15 PEOPLE MUST CHOOSE A FOR ACTION A TO BE SUCCESSFUL.
<0	0
0 – 6.6	1
6.7 – 13.3	2
13.4 – 20.0	3
20.1 – 26.6	4
26.7 – 33.3	5
33.4 – 40.0	6
40.1 – 46.6	7
46.7 – 53.3	8
53.4 – 60.0	9
60.1 – 66.6	10
66.7 – 73.3	11
73.4 – 80.0	12
80.1 – 86.6	13
86.7 – 93.3	14
93.4 – 100	15
>100	>15 (i.e. impossible)

Instructions for a second experiment

A second experiment will now take place, after which the entire experiment will conclude and you will receive the following amount in cash:

	Your show up fee of 15 Swiss Francs
+	Your income from experiment 1
+	Your income from experiment 2

=	Total income

The previous conversion rate applies for the calculation of the income from the second experiment, namely

10 points = 25 centimes

Information on the procedure of the second experiment

The new experiment is almost identical to the previous one and also consists of 20 rounds. The **only** difference from the previous experiment is as follows. If the experiment proceeds into stage 2 of a round, each of the 15 participants will receive an additional, **much more precise, private hint number**. The additional private hint number is a lot more precise (100 times more precise) such that there is approximately 67% probability that **Y now lies within ± 1 of your hint number**. Please, note that the value of the random number Y is the same in stage 1 and stage 2. However, because of **the additional, more precise hint number, you can better gauge the value of Y in stage 2**.

Example 1: You receive a private hint number of 20.2 in stage 2. There is thus a probability of approximately 67% that the unknown random number Y lies within ± 1 of your private hint number (i.e., there is 67% probability that Y lies between 19.2 and 21.2).

Example 2: You receive a private hint number of 63.1 in stage 2. There is a 67% probability that Y lies between 62.1 and 64.1.