

Appendix to *Efficiency and punishment in a coordination game*

Fabrice Le Lec, Astrid Matthey and Ondrej Rydval

Subject instructions, Stage 1, English translation Treatments *Baseline, Punishment and Disapproval*

Instructions

Welcome and thank you for participating in today's experiment! You earn **2.50€** for showing up on time. You can earn a considerable additional amount depending on your decisions. It is therefore very important that you read these instructions – which are the same for each participant - very carefully.

If you have any questions at any time during the experiment, please raise your hand and an experimenter will privately assist you. Please do not ask questions aloud.

Please switch off your mobile phone and keep quiet. Please beware that from now on, you are not allowed to exchange and kind of information with the other participants or to communicate with them. Any violation of these rules will lead to exclusion from the experiment and all payments.

Your decisions will be collected through the computer network and treated privately. At the end of the experiment, the 2.50€ for showing up on time as well as any remaining earnings that you make during the experiment will be paid to you privately in cash.

Procedure

The experiment consists of 2 parts. The present instructions are valid for the first part. After the end of the first part, you will receive the instructions for the second part.

In both parts of the experiment, you will receive a **starting amount of 4.00€**. You will be able to earn more money in either part of the experiment. However, at the end of the experiment, you will be paid your earnings from **only one of the two parts**. Which part is paid out will be chosen randomly at the end of the experiment. Namely, one of the 32 participants will draw a chip out of a bag with two chips. The number on the chip will determine which part of the experiment is paid out. You will receive your earnings from this randomly selected part.

1. Your task in the first part of the experiment

There are 32 participants in this room, but there will always be only 8 participants interacting with each other. The computer will choose randomly who will interact with whom. Thus you will not know which other 7 participants you interact with. However, **you will interact with the same 7 participants during the entire experiment, that is, during both parts of the experiment.**

The first part consists of **8 rounds**. In each round, you need to make a decision based on the rules described below. Your earnings in each round depend on your decision and the decisions made by the other 7 participants.

Your decision: **At the beginning of each round, you will choose a whole number between 1 and 7** (that is, 1, 2, 3, 4, 5, 6 or 7). This will be YOUR CHOSEN NUMBER. At the same time, the other 7 participants will also choose their number. While choosing your number, you will not know the numbers chosen by the other participants, nor will they know your number. As explained below, the numbers will only be revealed after all 8 participants have chosen their numbers and confirmed their decision.

The following earnings table shows how YOUR EARNINGS (in €) depend on the SMALLEST CHOSEN NUMBER (that is, the smallest of the 8 chosen numbers, including your own) and YOUR CHOSEN NUMBER:

		SMALLEST CHOSEN NUMBER (including your own)						
		7	6	5	4	3	2	1
YOUR CHOSEN NUMBER	7	2.60	2.20	1.80	1.40	1.00	0.60	0.20
	6		2.40	2.00	1.60	1.20	0.80	0.40
	5			2.20	1.80	1.40	1.00	0.60
	4				2.00	1.60	1.20	0.80
	3					1.80	1.40	1.00
	2						1.60	1.20
	1							1.40

All participants have the same earnings table at hand when making their decision.

This is how one can read the table:

You see YOUR EARNINGS (in €) at the “intersection” of the row showing YOUR CHOSEN NUMBER and the column showing the SMALLEST CHOSEN NUMBER.

Examples:

- If YOUR CHOSEN NUMBER were **4**, you would look at the row starting with 4. In case the SMALLEST CHOSEN NUMBER were 1, YOUR EARNINGS would be 0.80€. On the other hand, the earnings of the participant(s) choosing 1 would be 1.40€. In case the SMALLEST CHOSEN NUMBER were instead 4, YOUR EARNINGS would be 2.00€.

- If YOUR CHOSEN NUMBER were **7**, you would look at the row starting with 7. In case the SMALLEST CHOSEN NUMBER were 1, YOUR EARNINGS would be 0.20€. On the other hand, the earnings of the participant(s) choosing 1 would be 1.40€. In case the SMALLEST CHOSEN NUMBER were instead 4, YOUR EARNINGS would be 1.40€. The earnings of the participant(s) choosing 4 would be 2.00€. In case the SMALLEST CHOSEN NUMBER were 7, YOUR EARNINGS would be 2.60€.
- If YOUR CHOSEN NUMBER were **1**, you can see in the last column that your earnings would be 1.40€ since the SMALLEST CHOSEN NUMBER would be 1.

YOUR EARNINGS (in €) in each round will thus be determined by the following general formula:

$$0.4 \cdot \text{SMALLEST CHOSEN NUMBER} - 0.2 \cdot \text{YOUR CHOSEN NUMBER} + 1.2$$

2. After choosing your number

After the 8 participants have chosen their numbers and confirmed their decisions, another screen will appear, showing YOUR CHOSEN NUMBER and YOUR EARNINGS for the current round.

The same screen will also show the chosen numbers and earnings of the other 7 participants, ordered from the smallest to the largest number. You will also see your overall earnings up to this round (see the next paragraph for explanation).

The same information will be shown to the other participants.

After that, a new round will begin, following the same rules.

3. Your overall earnings from the first part

Your overall earnings in the first part of the experiment consist of your **starting amount of 4.00€ plus the sum of your earnings from the 8 rounds.**

To make sure you have understood the instructions correctly, **please answer the understanding questions on the next page.** Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Understanding questions:

The following examples are not meant as hints for how to make decisions! Please circle the correct answer. There can be one or more correct answers per question.

1. In this experiment, you will interact...
 - A. ...with 7 other participants who will be randomly chosen prior to each round.
 - B. ...with 8 other participants who will be randomly chosen prior to the first round and remain the same for the entire experiment.
 - C. ...with 7 other participants who will be randomly chosen prior to the first round and remain the same for the entire experiment.
 - D. ...with all the remaining 31 participants.

2. At the beginning of each round,...
 - A. ...you will choose either number 1 or number 7, while the other participants simultaneously choose their number as well.
 - B. ...you will choose a whole number between 1 and 7, after observing the other participants' chosen numbers for the current round.
 - C. ...the other participants will choose a whole number between 1 and 7, after observing YOUR CHOSEN NUMBER for the current round.
 - D. ...you will choose a whole number between 1 and 7, while the other participants simultaneously choose a whole number between 1 and 7 as well.

3. If YOUR CHOSEN NUMBER is 3 and the SMALLEST CHOSEN NUMBER is 2,...
 - A. ...YOUR EARNINGS in this round will be at least 1.00€ and at most 1.80€.
 - B. ...YOUR EARNINGS in this round will be 1.40€.
 - C. ...YOUR EARNINGS in this round will be 1.00€, regardless of the numbers chosen by the other participants.
 - D. ...the highest earnings achieved among the 8 participants will be 1.80€.

4. If YOUR CHOSEN NUMBER is 5, YOUR EARNINGS in this round will be...
 - A. ...at least 0.60€ and at most 2.20€, depending on the SMALLEST CHOSEN NUMBER.
 - B. ...2.20€.
 - C. ...1.40€ if the SMALLEST CHOSEN NUMBER is 3.
 - D. ...2.20€ or 2.40€, depending on the numbers chosen by the other participants.

Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Subject instructions, Stage 2 of *Baseline* treatment, English translation

Instructions for the second part of the experiment

The experiment will now continue with 8 more rounds that will be similar to the ones just finished. You will thus be able to earn an additional amount of money.

After these 8 rounds, the experiment will end and you will be paid your overall earnings privately in cash. Your overall earnings will consist of 2.50€ for showing up on time and your earnings from either part 1 or part 2 of the experiment. Which part of the experiment is paid out will be determined randomly at the end of the experiment.

Please beware that you are not allowed to exchange any kind of information with the other participants. If you have any questions please raise your hand. We will come to you and answer your questions individually.

Procedure

1. Your task in the second part of the experiment

In the following 8 rounds, you will interact with **the same 7 participants as before, that is, as in the first part of the experiment.**

At the beginning of each round, you will **make the same decision as before.** You will enter YOUR CHOSEN NUMBER, and YOUR EARNINGS will be determined based on the same earnings table (using the same formula) as before. As in the first part of the experiment, you will get a **starting amount of 4.00€.**

In case you wish to remind yourself how to choose your number, please see section **1. Your task in the first part of the experiment** of the instructions for the first part of the experiment. Everything explained there applies to this part of the experiment as well.

Understanding question:

Please circle the correct answer!

1. In the second part of the experiment, you will interact...
 - A. ...with 8 other participants who will remain the same for the entire experiment.
 - B. ... with the same 7 participants as in the first part of the experiment.
 - C. ... with 7 other participants who will be newly randomly chosen for this part of the experiment.
 - D. ... with 7 other participants who will be randomly chosen before each round.

Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Subject instructions, Stage 2 of *Punishment* treatment, English translation

Instructions for the second part of the experiment

The experiment will now continue with 8 more rounds that will be similar to the ones just finished. You will thus be able to earn an additional amount of money. It is therefore very important that you read these instructions – which are the same for each participant - very carefully.

After these 8 rounds, the experiment will end and you will be paid your overall earnings privately in cash. Your overall earnings will consist of 2.50€ for showing up on time and your earnings from either part 1 or part 2 of the experiment. Which part of the experiment is paid out will be determined randomly at the end of the experiment.

Please beware that you are not allowed to exchange any kind of information with the other participants. If you have any questions please raise your hand. We will come to you and answer your questions individually.

Procedure

1. Your task in the second part of the experiment

In the following 8 rounds, you will interact with **the same 7 participants as before, that is, as in the first part of the experiment.**

At the beginning of each round, you will **make the same decision as before.** You will enter YOUR CHOSEN NUMBER, and YOUR EARNINGS will be determined based on the same earnings table (using the same formula) as before. As in the first part of the experiment, you will get a **starting amount of 4.00€.**

In case you wish to remind yourself how to choose your number, please see section **1. Your task in the first part of the experiment** of the instructions for the first part of the experiment. Everything explained there applies to this part of the experiment as well.

2. After choosing your number

After the 8 participants have chosen their numbers and confirmed their decisions, another screen will appear, showing YOUR CHOSEN NUMBER and YOUR EARNINGS for the current round. The same screen will also show the chosen numbers and earnings of the other 7 participants, ordered from the smallest to the largest number. The same information will be shown to the other participants.

Up to here, everything is the same as in the first part of the experiment. However, you can now **assign points to the other participants.** The table showing the

chosen numbers and earnings of the other participants will now contain a field next to each participant in which you can enter the assigned points. **The following rules apply for assigning points:**

- You must fill out all fields of the table. **In case you do not wish to assign a participant any points, simply enter 0 in the appropriate field.** You can of course assign different number of points to different participants.
- **Every point** that you assign to another participant **will cost you 0.10€** (that is, your overall earnings will be reduced by 0.10€) while the **other participant's overall earnings will be reduced by 0.20€**. The table will also show how much your assigned points reduce your earnings and the earnings of the other participants.
- In order to cover the cost of assigning points, **you can use your current overall earnings in the second part of the experiment** (that is, your overall earnings up to the last completed round). In the first round, your current overall earnings available for assigning points thus correspond to the starting amount of 4.00€. The screen will show your current overall earnings for the second part of the experiment as well as your cost of assigning points in the current round. In case the cost exceeds your overall earnings, you will be asked to adjust the assigned points.
- **Your assigned points cannot decrease a participant's earnings in the current round below 0€.** In case your points were to decrease a participant's earnings in the current round below 0€, you will be asked to adjust the assigned points.
- **The total points assigned to a participant by the other 7 participants cannot decrease the participant's earnings in the current round below 0€.** In case the total points assigned to a participant were to reduce his or her earnings below 0€, the participant's earnings in the current round will be set to 0€. **However, even in such a case, the costs of all assigned points still have to be borne by the participants who assigned them.**
- Beneath the table where you assign points, there will be a **"CALCULATE" button**. You can press the button **anytime** (even if you are not done with assigning points). Pressing the button will update the table, so that you can see how much the assigned points cost you and by how much they reduce the other participants' earnings. Thereafter, you can again adjust the assigned points if you wish. Once you are completely done with assigning points, please confirm your decision.
- **The other participants can simultaneously assign points as well, following the same rules.** Thus while assigning points, you will not know how many points the other participants assigned to you (and to others), nor will the other participants know how many points you assigned to them. The consequences of

the assigned points will only be shown when each of the 8 participants have assigned points and confirmed their decision.

3. After assigning points

After each of the 8 participants have assigned points and confirmed their decision, another screen will show the following information:

In this round, you were assigned ___ points by the other 7 participants. Therefore, YOUR EARNINGS in this round will be reduced from ___€ to ___€. The last mentioned amount will be added to your current overall earnings.

You assigned ___ points to the other 7 participants. These assigned points cost you ___€. This amount will be subtracted from your current overall earnings.

Your current overall earnings after this round will be ___€.

The same information will be shown to the other participants.

After that, a new round will begin, following the same rules.

4. Your overall earnings in the second part

Your overall earnings for the second part of the experiment will be the overall earnings shown to you after completing **all 8 rounds** of the second part.

5. Your final payment

At the end of the last round of this second part of the experiment, you will be shown your overall earnings from both parts of the experiment. Then one of the 32 participants will draw a chip out of a bag with two chips. The number on the chip will determine which part of the experiment is paid out. You will receive your overall earnings from this randomly selected part, plus the 2,50€ for showing up on time.

To make sure you have understood the instructions correctly, **please answer the understanding questions on the next page**. Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Understanding questions:

The following examples are not meant as hints for how to make decisions! Please circle the correct answer (there can be one or more correct answers per question) and fill out all fields.

1. In the second part of the experiment, you will interact...
 - A. ...with 8 other participants who will remain the same for the entire experiment.
 - B. ... with the same 7 participants as in the first part of the experiment.
 - C. ... with 7 other participants who will be newly randomly chosen for this part of the experiment.
 - D. ... with 7 other participants who will be randomly chosen before each round.

2. Which of the following rules apply for assigning points?
 - A. You must assign 1 or more points to each of the 7 other participants, and each point will cost you 0.10€.
 - B. The assigned points cannot cost you more than your current overall earnings from the second part of the experiment, nor can your assigned points decrease a participant's earnings in the current round below 0€.
 - C. While assigning points, you will already know how many points the other participants assigned to you (and to others) in the current round.
 - D. The consequences of the assigned points will only be shown when each of the 8 participants have assigned points and confirmed their decision.

3. You assign 6 points to a participant whose earnings are 2.00€. These points will cost you ___€, and the points will reduce the other participant's earnings at most / exactly / at least (delete as appropriate) by ___€.

4. YOUR CHOSEN NUMBER is 3, and the SMALLEST CHOSEN NUMBER is 2. The other participants assigned you 5 points, and you assigned the other participants 3 points in total. Therefore, ___€ will be added to your current overall earnings.

5. Your current overall earnings are 8.00€, and the SMALLEST CHOSEN NUMBER is 3. If you in this round chose number 5, assigned 3 points to the other participants, and they assigned 2 points to you, your current overall earnings at the end of this round would be ___€.

Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Instructions for the second part of the experiment

The experiment will now continue with 8 more rounds that will be similar to the ones just finished. You will thus be able to earn an additional amount of money. It is therefore very important that you read these instructions – which are the same for each participant - very carefully.

After these 8 rounds, the experiment will end and you will be paid your overall earnings privately in cash. Your overall earnings will consist of 2.50€ for showing up on time and your earnings from either part 1 or part 2 of the experiment. Which part of the experiment is paid out will be determined randomly at the end of the experiment.

Please beware that you are not allowed to exchange any kind of information with the other participants. If you have any questions please raise your hand. We will come to you and answer your questions individually.

Procedure

1. Your task in the second part of the experiment

In the following 8 rounds, you will interact with **the same 7 participants as before, that is, as in the first part of the experiment.**

At the beginning of each round, you will **make the same decision as before.** You will enter YOUR CHOSEN NUMBER, and YOUR EARNINGS will be determined based on the same earnings table (using the same formula) as before. As in the first part of the experiment, you will get a **starting amount of 4.00€.**

In case you wish to remind yourself how to choose your number, please see section **1.Your task in the first part of the experiment** of the instructions for the first part of the experiment. Everything explained there applies to this part of the experiment as well.

2. After choosing your number

After each of the 8 participants have chosen their number and confirmed their decision, another screen will appear, showing YOUR CHOSEN NUMBER and YOUR EARNINGS for the current round. The same screen will also show the chosen numbers and earnings of the other 7 participants, ordered from the smallest to the largest number. The same information will be shown to the other participants.

Up to here, everything is the same as in the first part of the experiment. However, you can now **assign penalty points to the other participants in order to express your disapproval of their chosen number.** You can assign between 0 and 6

penalty points (0, 1, 2, 3, 4, 5 or 6), where **6 points express the strongest disapproval and 0 points express no disapproval.**

The table showing the chosen numbers and earnings of the other participants will now contain a field next to each participant in which you can enter the penalty points. **The following rules apply for assigning penalty points:**

- You must fill out all fields. In case you do not wish to disapprove a participant's choice, simply enter 0 in the appropriate field. You can of course assign different number of points to different participants.
- **The assignment of penalty points has no consequences for your earnings or the earnings of the participants to whom you assign points. The points only convey your disapproval of the numbers chosen by the other participants.**
- **The other participants can simultaneously assign penalty points as well, following the same rules.** Thus while assigning penalty points, you will not know how many points the other participants assigned to you (and to others), nor will the other participants know how many points you assigned to them.

3. After assigning penalty points

After each of the 8 participants have assigned penalty points, another screen will show the following information:

In this round, you were assigned ___ penalty points by the other 7 participants. You assigned ___ penalty points to the other participants.

Your current overall earnings in the second part of the experiment up to this round are ___€.

The same information will be shown to the other participants.

After that, a new round will begin, following the same rules.

4. Your overall earnings in the second part

You will begin this second (and last) part of the experiment with your starting amount of 4.00€. YOUR EARNINGS from each round will be added to that amount.

5. Your final payment

At the end of the last round of this second part of the experiment, you will be shown your overall earnings from both parts of the experiment. Then one of the 32 participants will draw a chip out of a bag with two chips. The number on the chip will determine which part of the experiment is paid out. You will receive your overall earnings from this randomly selected part, plus the 2,50€ for showing up on time.

To make sure you have understood the instructions correctly, **please answer the understanding questions on the next page**. Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.

Understanding questions:

The following examples are not meant as hints for how to make decisions! Please circle the correct answer (there can be one or more correct answers per question) and fill out all fields.

1. In the second part of the experiment, you will interact...
 - A. ...with 8 other participants who will remain the same for the entire experiment.
 - B. ... with the same 7 participants as in the first part of the experiment.
 - C. ... with 7 other participants who will be newly randomly chosen for this part of the experiment.
 - D. ... with 7 other participants who will be randomly chosen before each round.

2. Which of the following rules apply for assigning penalty points?
 - A. You must assign between 0 and 6 points to each of the 7 other participants.
 - B. The penalty points that you assign to another participant will cost you and the other participant ___€ per each penalty point.
 - C. While assigning penalty points, you already know how many penalty points the other participants assigned to you (and to the other participants) in the current round.
 - D. The total of assigned penalty points will only be shown when each of the 8 participants have assigned points and confirmed their decision.

3. YOUR CHOSEN NUMBER is 3 and the SMALLEST CHOSEN NUMBER is 2. The other participants assign you 5 penalty points, and you assign them a total of 3 penalty points. Therefore, ___€ will be added to your current overall earnings up to this round.

Please raise your hand when you are done or if you have any questions. We will come to you and answer your questions individually.