Supplementary Material

Experimental Instructions

(Note: Below we report the instructions used in the DS sequence of the experiment. For the SD sequence, the order of the 'First Experiment' and of the 'Second Experiment' was reversed.)

Instructions

You are now about to take part in an experimental economics session financed by the University of Nottingham. If you read the following instructions carefully, you can, depending on the decisions that you and other participants make, earn a considerable amount of money. It is therefore very important that you read these instructions with care.

These instructions are solely for your private use. **It is prohibited to communicate with the other participants during the session.** Should you have any questions, please ask us.

During the session we will not speak in terms of Pounds, but of Money Units. Your entire earnings will, thus, be calculated in Money Units. At the end of the session the total amount of Money Units you have earned will be converted to Pounds at the following rate:

$$1 \text{ Money Unit} = 0.015 \text{ Pounds}$$

At the end of the session your entire earnings will be paid to you **in cash**.

During this session, you will take part in two experiments. You will now undertake the first experiment. You will learn about the second experiment at the beginning of that experiment, where you will receive new instructions.
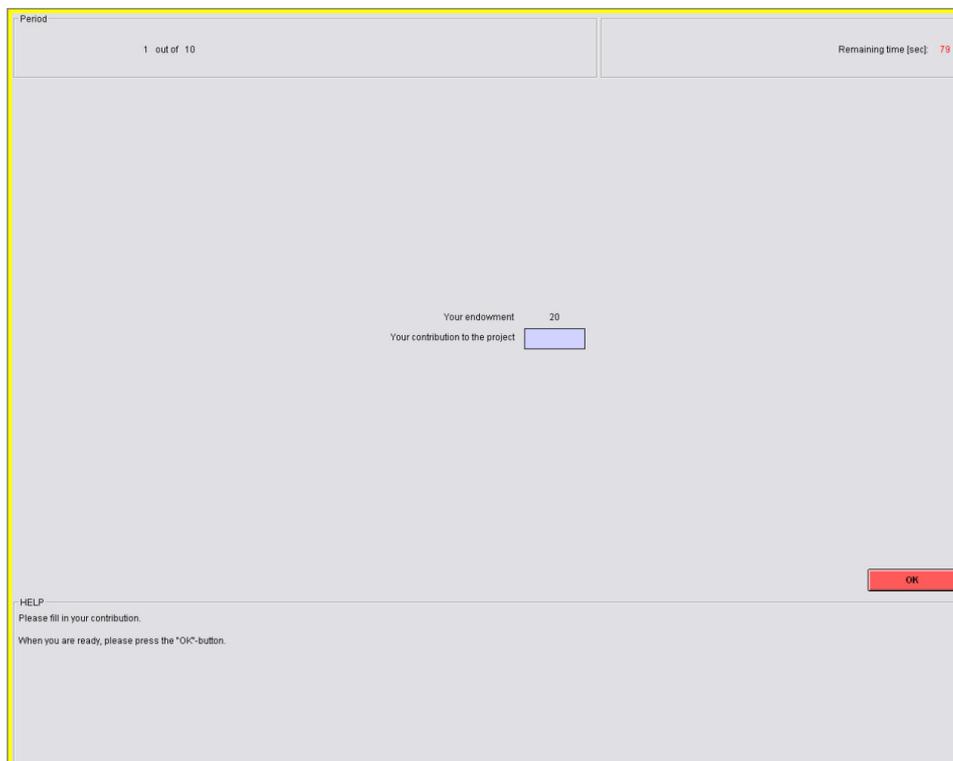
FIRST EXPERIMENT

This experiment has ten periods. In each period the participants are divided into groups of four. You will therefore be in a group with 3 other participants. **The composition of the groups will remain the same throughout the experiment.** Each period has two stages, which are described below.

The First Stage

At the beginning of each period each participant receives **20 tokens**. We call this his or her **endowment**. Your task is to decide how to use your endowment. You have to decide how many of the 20 tokens you want to contribute to a **project** and how many of them to keep for yourself. The consequences of your decision are explained in detail below.

At the beginning of each period the following input-screen for the first stage will appear:

The period identifier appears in the top left corner of the screen. In the top right corner you can see how many more seconds remain for you to decide on the distribution of your tokens. You will have 90 seconds to decide in the first period and 30 seconds in the remaining periods. Your decision must be made before the time displayed is 0 seconds.

Your endowment in each period is 20 tokens. You have to decide how many tokens you want to contribute to the project by typing a number between 0 and 20 in the input field. This field can be reached by clicking it with the mouse. By deciding how many tokens to contribute to the project, you automatically decide how many tokens you keep for yourself: This is (**20 – your contribution to the project**) tokens. After entering your contribution you must press the O.K. button. Once you have done this, your decision can no longer be revised.

Your **income** consists of two parts:

(1) The tokens which you have kept for yourself ("Income from retained tokens") whereby

1 token = 1 Money Unit.

(2) The "Income from the project". This income is calculated as follows:

Your income from the project = 0.5 *times* the total contributions to the project.

> **Your income from the first stage of a period in Money Units is therefore:**
>
> **(20 – your contribution to the project) + 0.5*(total contributions to the project)**

After all members of your group have made their decision the following screen will show you the total amount of tokens contributed by all four group members to the project (including your contribution). This screen also shows you how many Money Units you have earned at the first stage. Numbers shown in this screenshot are for example purposes only.

Income screen at the end of the first stage

The income of each group member from the project is calculated in the same way, i.e., each group member receives the same income from the project. Assume, for example, that the sum of the contributions of all group members is 44 tokens. In this case each member of the group receives an income from the project of: 0.5*44 = 22 Money Units.

For each token which you keep for yourself you earn an income of 1 Money Unit. Supposing you contributed this token to the project instead, then the total contributions to the project would rise by one token. Your income from the project would rise by 0.5*1=0.5 Money Units. However the income of the other group members would also rise by 0.5 Money Units each, so that the total income of the group from the project would rise by 2 Money Units. Your contribution to the project therefore also raises the income of the other group members. On the other hand you earn an income for each token contributed by the other members to the project. For each token contributed by any member you earn 0.5*1=0.5 Money Units.

To view the income screen at the end of the first stage, you have 45 seconds in the first period and 20 seconds in the remaining periods. If you are finished with it before the time is up, please press the continue button. As long as you have inspected the results of the first stage of a period, the second stage starts.

The Second Stage

At the start of the second stage, you see how much each group member contributed to the project in the first stage. **Regardless of contributions, you will also receive an automatic penalty of 10 Money Units. During this stage, you can alter the income of each other group member by assigning adjustment points. By assigning adjustment points, you can reward the other group members. This can alleviate the automatic penalty of 10 Money Units.** You can assign between 0 and 2 adjustment points to each group member.

Each adjustment point that you assign to another group member increases their income by 3 Money Units, so alleviating their automatic penalty by the same amount. For example, if you assign 2 adjustment points, this group member's income will be increased by 6 Money Units, except that adjustment points cannot do more than fully alleviate the automatic penalty.   Thus, a group member's income cannot be increased by more than ten, through adjustment points assigned by others.

If you assign adjustment points, you have costs in Money Units. The more adjustment points you assign, the higher your costs. Specifically, **for each adjustment point that you assign, there is a cost to you of 1 Money Unit.** For example, if you assign 2 adjustment points, this costs you 2 Money Units. We refer to this as "Cost of adjustment points assigned by you".

Just as you can alleviate other players automatic penalty by assigning adjustment points to them, so they can also alleviate your automatic penalty by the same method. We refer to this as "Number of adjustment points assigned to you".

Your total income from the two stages is therefore calculated as follows:

Total income (in Money Units) at the end of the second stage = Period income =

   = Income from the first stage

   – Automatic penalty

   – Cost of adjustment points assigned by you

   + 3*(Number of adjustment points assigned to you)

if the impact of the adjustment points assigned to you is less than the automatic penalty;
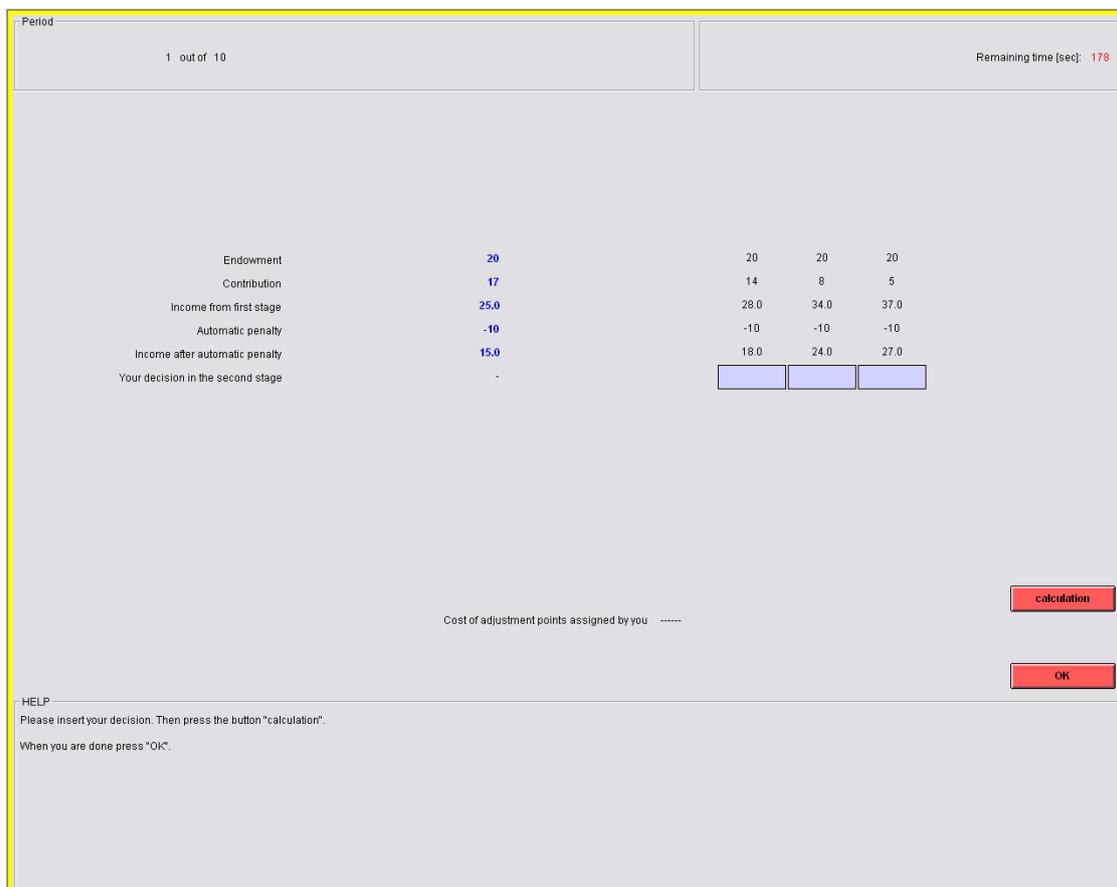

OR

   = Income from the first stage

   – Cost of adjustment points assigned by you

            if the impact of the adjustment points assigned to you is greater than the automatic penalty.

The way with which you can assign adjustment points is apparent from the input screen at the second stage. Numbers shown in this screenshot are for example purposes only.

Input screen at the second stage

Besides the period and time display, you now see how much each group member contributed to the project in the first stage. **Your contribution is displayed in blue in the first column,** while the contributions of the other group members of this period are shown in the remaining three columns. Please note that the order in which contributions are displayed changes in a random order in each period. The contribution in the second column, for example, generally represents a different group member each time. The same holds for the contributions in the other columns. That way you are informed about the contributions but not about the identities of the other group members. Besides the absolute contributions, the income from the first stage and the income after the automatic penalty are also displayed.

You must decide whether and if so how many adjustment points to assign. In any case you must enter a number in the large blue box for each group member. For this decision, you have 180 seconds in the first period and 60 seconds in the remaining periods. You can move from one input field to the other by pressing the tab-key ($\rightarrow$|) or by using the mouse.

You can determine the total costs you incur on the computer. To perform the calculation you have to press the button "**Calculation**" (see the input screen at the second stage). You can do this after you have made an input. On the screen you will see the total costs of the points you assigned. As long as you have not yet pressed the **OK-button**, you can still change your decision (within the remaining time). To recalculate the cost after a change of the adjustment points you assigned, simply press the "Calculation" button again.

After all participants have made their decisions, your income from the period will be displayed on the following screen. Numbers shown in this screenshot are for example purposes only. To view the income screen at the end of the second stage, you have 45 seconds in the first period and 30 seconds in the remaining periods. If you are finished with it before the time is up, please press the continue button.

Income screen at the end of the second stage

Depending on the decisions that you and others take, it is possible for the net effect on your income of the adjustment points assigned in the second stage to be negative. However, taking all periods together, any such losses will always be outweighed by the income from the first stage and a lump sum payment of 60 Money Units that you receive at the beginning of the experiment.

Do you have any questions?

Control Questionnaire

1. Each group member has an endowment of 20 tokens. Nobody (including yourself) contributes any tokens to the project.
What is your income from the first stage? ....
What is the income from the first stage of the other group members? ....

2. Each group member has an endowment of 20 tokens. You contribute 20 tokens to the project. All other group members each contribute 20 tokens to the project.
What is your income from the first stage? ....
What is the income from the first stage of the other group members? ....

3. Each group member has an endowment of 20 tokens. The other three group members contribute together a total of 30 tokens to the project.
What is your income from the first stage if you contribute 0 tokens to the project? ....
What is your income from the first stage if you contribute 15 tokens to the project? ....

4. Each group member has an endowment of 20 tokens. You contribute 8 tokens to the project.
What is your income from the first stage if the other group members together contribute a total of 7 tokens to the project? ....
What is your income from the first stage if the other group members together contribute a total of 22 tokens to the project? ....

5. At the second stage you assign the following adjustment points: 1, 1, 0. What are the costs of adjustment points assigned by you? ....

6. What are your costs if you assign a total of 0 adjustment points? ....

7. By how many Money Units will your income from the first stage be changed by the adjustment points assigned to you by other group members if the other group members assign a total of 0 adjustment points to you? ....

8. By how many Money Units will your income from the first stage be changed by the adjustment points assigned to you by other group members if the other group members assign a total of 3 adjustment points to you? ....

SECOND EXPERIMENT

You will now undertake the second experiment. This experiment has ten periods, each of which has two stages. In each period the participants are divided into groups of four. You will therefore be in a group with 3 other participants. **The composition of the groups will remain the same as in the first experiment.** In the following pages we describe both stages of this experiment.

At the end of the subsequent ten periods the whole session is finished and you will receive:

Your income from the first 10 periods (First Experiment) + Your income from the second 10 periods (Second Experiment) = Total sum of Money Units

The First Stage

The first stage of the second experiment is identical to that of the first experiment. At the first stage you have to decide how many tokens out of 20 you want to contribute to a project (and hence you decide with it how many tokens you keep for yourself). Your income from the first stage of the second experiment will be calculated exactly in the same way as in the previous experiment.

For each token you keep for yourself, you earn an income of 1 Money Unit. For each token you contribute to the project, you and all other group members will earn 0.5 Money Units. Therefore, each token that another group member contributes to the project will increase your income by 0.5 Money Units.

The Second Stage

At the start of the second stage, you see how much each group member contributed to the project in the first stage. **During this stage, you can alter the income of each other group member by assigning adjustment points. By assigning adjustment points, you can penalise the other group members.** You can assign between 0 and 2 adjustment points to each group member.

Each adjustment point that you assign decreases this group member's income by 3 Money Units. For example, if you assign 2 adjustment points, this group member's income will be decreased by 6 Money Units.   The only exception arises because adjustment points cannot do more than eliminate a group member's first stage income.   Thus, a group member's income cannot be decreased by more than their first stage income, through adjustment points assigned by others.

If you assign adjustment points, you have costs in Money Units. The more adjustment points you assign, the higher your costs. Specifically, **for each adjustment point that you assign, there is a cost to you of 1 Money Unit.** For example, if you assign 2 adjustment points, this costs you 2 Money Units. We refer to this as "Cost of adjustment points assigned by you".

Just as you can penalise other players by assigning adjustment points to them, so they can also penalise you by the same method. We refer to this as "Number of adjustment points assigned to you".

Your total income from the two stages is therefore calculated as follows:

Total income (in Money Units) at the end of the second stage = Period income =

= Income from the first stage

– Cost of adjustment points assigned by you

– 3*(Number of adjustment points assigned to you)

if the impact of the adjustment points assigned to you is less than the income from the first stage;
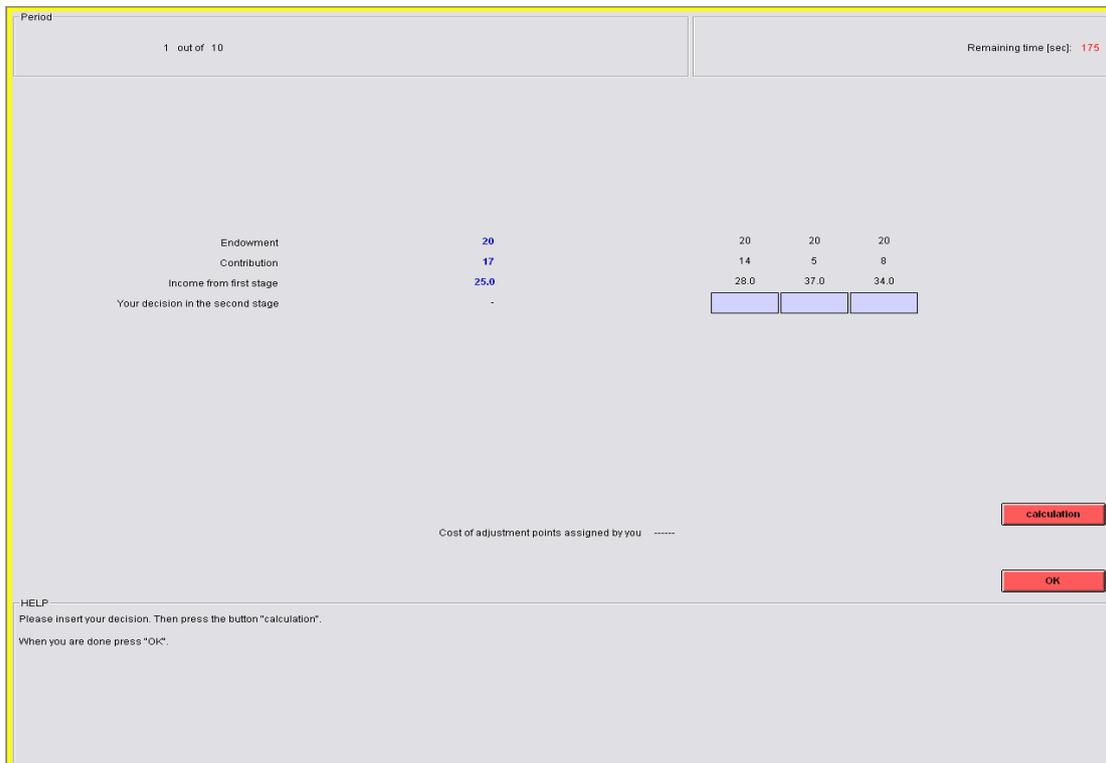
OR

= 0 – Cost of adjustment points assigned by you

if the impact of the adjustment points assigned to you is greater than the income from the first stage.

The way with which you can assign adjustment points is apparent from the input screen at the second stage. Numbers shown in this screenshot are for example purposes only.

Input screen at the second stage

Besides the period and time display, you now see how much each group member contributed to the project in the first stage. **Your contribution is displayed in blue in the first column,** while the contributions of the other group members of this period are shown in the remaining three columns. Please note that the order in which contributions are displayed changes in a random order in each period. The

contribution in the second column, for example, generally represents a different group member each time. The same holds for the contributions in the other columns. That way you are informed about the contributions but not about the identities of the other group members. Besides the absolute contributions, the income from the first stage is also displayed.

You must decide whether and if so how many adjustment points to assign. In any case you must enter a number in the large blue box for each group member. For this decision, you have 180 seconds in the first period and 60 seconds in the remaining periods. You can move from one input field to the other by pressing the tab-key ($\rightarrow|$) or by using the mouse.

You can determine the total costs you incur on the computer. To perform the calculation you have to press the button "**Calculation**" (see the input screen at the second stage). You can do this after you have made an input. On the screen you will see the total costs of the points you assigned. As long as you have not yet pressed the **OK-button**, you can still change your decision (within the remaining time). To recalculate the cost after a change of the adjustment points you assigned, simply press the "Calculation" button again.

After all participants have made their decisions, your income from the period will be displayed on the following screen. Numbers shown in this screenshot are for example purposes only. To view the income screen at the end of the second stage, you have 45 seconds in the first period and 30 seconds in the remaining periods. If you are finished with it before the time is up, please press the continue button.

Income screen at the end of the second stage

Depending on the decisions that you and others take, it is possible for the net effect on your income of the adjustment points assigned in the second stage to be negative. However, taking all periods together, any such losses will always be outweighed by the income from the first stage and a lump sum payment of 60 Money Units that you receive at the beginning of the experiment.

Do you have any questions?

Control Questionnaire

1. At the second stage you assign the following adjustment points: 1, 1, 0. What are the costs of adjustment points assigned by you? .....

2. What are your costs if you assign a total of 0 adjustment points? ....

3. By how many Money Units will your income from the first stage be changed by the adjustment points assigned to you by other group members if the other group members assign a total of 0 adjustment points to you? ....

4. By how many Money Units will your income from the first stage be changed by the adjustment points assigned to you by other group members if the other group members assign a total of 3 adjustment points to you?