

Instructions in English

[[[The experiment was run in Austria; the displayed instructions and screenshots are translated from German.]]]

1 Title page *[[[for all treatments the same]]]*

Dear participants,

welcome to today's experiment.

Please read the instructions for the experiment carefully. All statements in the instructions are true, and all participants receive exactly the same instructions. Your earnings in the experiment depend on your decisions and potentially the decisions of others. If you have a question, please raise your hand. Your question will then be answered privately. The experiment as well as the data analysis is anonymous.

We ask you not to talk to other participants and to use only the resources and devices that are provided by the conductors of the experiment. Please switch off all electronic devices. In addition, at the computer you are only allowed to use features that are necessary for the experiment. If you do not comply with these rules, you won't be paid in this experiment and you are not allowed to participate in any further experiments.

For today's experiment, funds are provided by the Austrian Science Fund.

The currency used in the experiment is tokens. Tokens will be converted to Euros at a rate of 10 tokens to 1 Euro. You have already received a €9.00 participation fee. Your earnings from the experiment will be incorporated into your participation fee. At the end of today's experiment, you will be paid privately in cash.

The experiment consists of two parts. In total, the two parts will last for around 75 minutes. The two parts of the experiment are completely independent from each other. That is, your payment for part x only depends on decisions that you take in part x, and does not depend on decisions you take in the other part of the experiment.

At the beginning of each part you receive the corresponding instructions. We will read the instructions out loud and will give you time for questions. For a better understanding, in the following we will only use male designations. Those should be understood gender neutral. Thank you a lot for your attention and for participating in today's experiment.

2 Treatment S

[[[These are the instructions for the no-shock treatment. When instructions are adapted to the shock treatment, we mark the respective parts with squared brackets.]]]

PART 1

The role assignment

This part consists of 10 periods. In each period you are anonymously assigned to a group, which consists of two participants: participant A and participant B. At the beginning of the first period you will be randomly assigned either as participant A or participant B. You will remain in the same role throughout part 1 of the experiment. So, if you are assigned as participant B in the first period, then you will stay as participant B throughout the 10 periods of part 1.

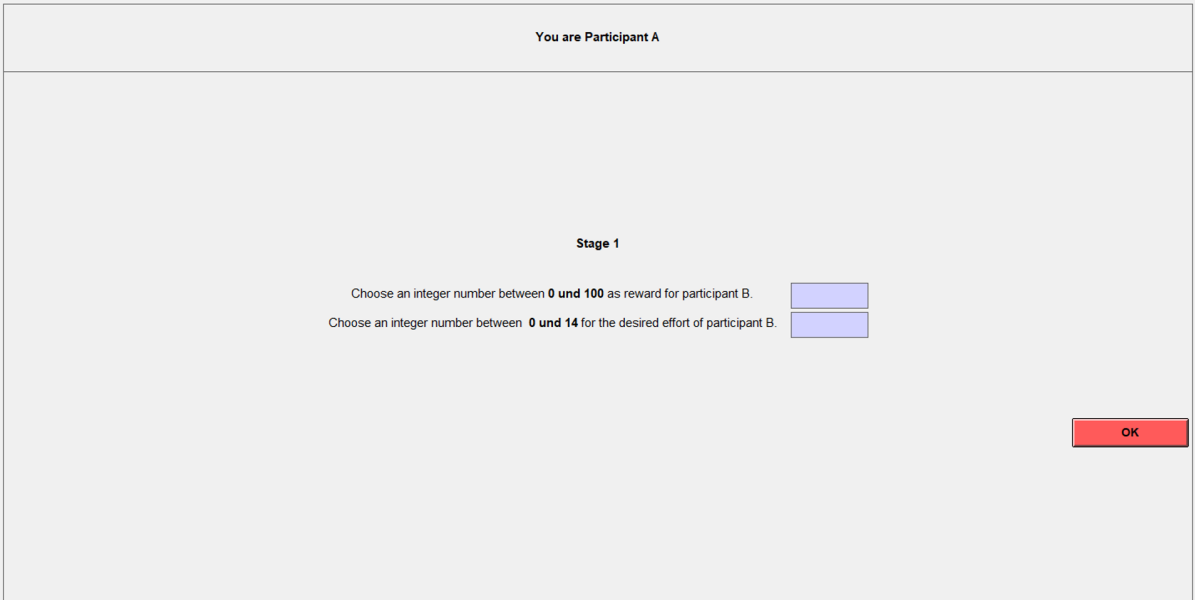
Independently on your role, at the beginning of each period you are randomly assigned another participant in the other role. That is, if you are participant B, for each period you get assigned another participant A.

Each period will proceed in three stages.

Stage 1

In stage 1, participant A will choose a reward (any integer number between 0 and 100) and a desired effort (any integer number between 0 and 14) for participant B.

An example of the decision screen in stage 1 for participant A is shown below.



The screenshot shows a decision screen for Participant A in Stage 1. At the top, a header bar says "You are Participant A". Below this, the text "Stage 1" is centered. The main instruction is "Choose an integer number between 0 und 100 as reward for participant B." followed by a blue input box. Below that, the instruction is "Choose an integer number between 0 und 14 for the desired effort of participant B." followed by another blue input box. In the bottom right corner, there is a red button labeled "OK".

Stage 2

On the screen, participant B is shown the reward and the desired effort chosen by participant A. Then, participant B will choose an effort level (any integer number between 0 and 14).

An example of the stage 2 decision screen for participant B is shown below.

You are participant B

Stage 1

The reward is 56.
The desired effort is 9.

Stage 2

Choose an integer number between 0 and 14 as your effort.

OK

For each effort level chosen by participant B there is an associated cost of effort. The cost of effort can be found in the following table:

Effort	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cost of effort	0	1	2	5	8	13	18	25	32	41	50	61	72	85	98

Note that as effort rises from 0 to 14, costs rise exponentially.

Stage 3

After participant B chooses the effort level, the performance of participant B is determined as follows: Participant B's performance = effort of participant B. Then the computer will display to participant A the performance of participant B on the screen.

[[[Shock treatment: After participant B chooses the effort level, the computer will add to effort a random number to determine the performance of participant B:

Participant B's performance = effort + random number.

The random number chosen by the computer can take a value of -2, -1, 0, 1, or 2. Each number is equally likely to be drawn.

Following the draw of the random number Participant B's performance will be shown to Participant A. Participant A will not know Participant B's actual effort or the random number drawn by the computer.]]]

Then, in the third stage, participant A will choose an adjustment level. The adjustment level must be a multiple of 10, between -50 and 50.

An example of the stage 3 decision screen for participant A is shown on the next picture.

The screenshot shows a decision screen for participant A. At the top, it says "You are participant A". Below this, the screen is divided into three stages. Stage 1 shows "The reward is 56." and "The desired effort is 9." Stage 2 shows "The performance is 11." Stage 3 shows "Choose a multiple of 10, between -50 and 50, as adjustment." with a text input field. An "OK" button is located at the bottom right.

For each adjustment level chosen by participant A there is an associated cost of adjustment. The cost of adjustment can be found in the following table:

Adjustment	-50	-40	-30	-20	-10	0	10	20	30	40	50
Cost of adjustment	5	4	3	2	1	0	1	2	3	4	5

Earnings of participant A

The earnings of participant A depend on the reward chosen by participant A in the first stage, the performance of participant B in the second stage and the adjustment chosen by participant A in the third stage. Specifically, the participant A's earnings are calculated by the following formula:

$$\text{Participant A's earnings} = 10 * (\text{performance participant B}) - (\text{reward}) - (\text{cost of adjustment})$$

$$[[[= 10 * (\text{effort of part. B} + \text{random number}) - (\text{reward}) - (\text{cost of adj.})]]]$$

Note that higher participant B's effort implies higher participant B's performance, and thus higher participant A's earnings. On the other hand, a higher reward or a higher cost of adjustment implies lower participant A's earnings.

Earnings of participant B

The earnings of participant B depend on the reward chosen by participant A in the first stage, the cost of the effort chosen by participant B in the second stage and the adjustment chosen by participant A in the third stage. Specifically, participant B's earnings are calculated by the following formula:

$$\text{Participant B's earnings} = (\text{reward}) - (\text{cost of effort}) + (\text{adjustment})$$

Note that a higher reward chosen by participant A implies higher participant B's earnings. On the other hand, a higher effort implies higher effort costs and therefore lower participant B's earnings. If participant A chooses a positive adjustment level for participant B then participant B's earnings increase by that adjustment level. However, if participant A chooses a negative adjustment level then participant B's earnings decrease by that adjustment level.

Example 1

Assume the following scenario. In the first stage, participant A chooses a reward of 50 and a desired effort of 7. In the second stage, participant B chooses an effort of 6. [[[Then the computer selects 2 as a random number,]]] so the performance of participant B is 6 [[[8 (6+2)]]]. Then the computer displays to participant A that participant B's performance is 6 [[[8]]]. After observing this information, in the third stage, participant A chooses an adjustment of -40.

Therefore, participant A's earnings = $10 \cdot 6 - 50 - 4 = 6$, since participant B's performance is 6, the reward is 50, and the cost of adjustment of -40 is 4. Finally, participant B's earnings = $50 - 18 - 40 = -8$, since the reward is 50, the cost of effort of 6 is 18, and the adjustment is -40.

[[[Therefore, participant A's earnings = $10 \cdot 8 - 50 - 4 = 26$, since participant B's performance is 8, the reward is 50, and the cost of adjustment of -40 is 4. Finally, participant B's earnings = $50 - 18 - 40 = -8$, since the reward is 50, the cost of effort of 6 is 18, and the adjustment is -40.]]]]

Example 2

Assume the following scenario. In the first stage, participant A chooses a reward of 40 and a desired effort of 6. In the second stage, participant B chooses an effort of 9. [[[Then the computer selects -2 as a random number,]]] so the performance of participant B is 9 [[[7 (9-2)]]]. Then the computer displays to participant A that participant B's performance is 9 [[[7]]]. After observing this information, in the third stage, participant A chooses an adjustment of 30.

Therefore, participant A's earnings = $10 \cdot 9 - 40 - 3 = 47$, since participant B's performance is 9, the reward is 40, and the cost of adjustment of 30 is 3. Finally, participant B's earnings = $40 - 41 + 30 = 29$, since the reward is 40, the cost of effort of 9 is 41, and the adjustment is 30.

[[[Therefore, participant A's earnings = $10 \cdot 7 - 40 - 3 = 27$, since participant B's performance is 7, the reward is 40, and the cost of adjustment of 30 is 3. Finally, participant B's earnings = $40 - 41 + 30 = 29$, since the reward is 40, the cost of effort of 9 is 41, and the adjustment is 30.]]]]

End of the period

At the end of each period, the computer will display to both participants the following information: the reward chosen by participant A, the desired effort chosen by participant A, the performance of participant B, the adjustment chosen by participant A, as well as individual earnings for that period. An example of the outcome screen is shown below.

At the end of each period, the computer will calculate individual earnings.

An example is shown on the following picture.

Once your earnings are displayed on the screen, please record your earnings for the period in your personal record sheet under the appropriate heading.

Important notes

Remember you have already received a €9.00 participation fee. In part 1 of the experiment, depending on a period, you may receive either positive or negative earnings. At the end of part 1 we will randomly select 1 out of 10 periods for actual payment and convert the income thereof to a payment in Euros. If the earnings are negative, we will subtract them from your total earnings. If the earnings are positive, we will add them to your total earnings.

Are there any questions?

You are participant A
Stage 1 The reward is 56. The desired effort is 9. Stage 2 The performance is 11. Stage 3 The adjustment is 20. The cost of the adjustment is 2. Your income = $10 \times \text{performance} - \text{reward} - (\text{cost of adjustment})$ Your income from this period is 52.00Token.

Control questions *[[[implemented in z-Tree]]]*

Question 1: Assume the following scenario. Participant A chooses a reward of 30 and a desired effort of 8. In the second stage, participant B chooses an effort of 7, so the performance of participant B is 7. Then the computer displays to participant A that participant B's performance is 7. After observing this information, in the third stage, participant A chooses an adjustment of 40. What are participant A's earnings? _____(correct: $10 \times 7 - 30 - 4 = 36$) What are participant B's earnings? _____ (correct: $30 - 25 + 40 = 45$)

Question 2: Assume the following scenario. Participant A chooses a reward of 40 and a desired effort of 5. In the second stage, participant B chooses an effort of 1, so the performance of participant B is 1. Then the computer displays to participant A that participant B's performance is 1. After observing this information, in the third stage, participant A chooses an adjustment of -50. What are participant A's earnings? _____(correct: $10 \times 1 - 40 - 5 = -35$) What are participant B's earnings? _____ (correct: $40 - 1 - 50 = -11$)

[[[Question 1: Assume the following scenario. Participant A chooses a reward of 30 and a desired effort of 8. In the second stage, participant B chooses an effort of 7. Then the computer selects 1 as a random number, so the performance of participant B is 8 ($7 + 1$). Then the computer displays to participant A that participant B's performance is 8. After observing this information, in the third stage, participant A chooses an adjustment of 40. What are participant A's earnings? _____(correct: $10 \times 8 - 30 - 4 = 46$) What are participant B's earnings? _____ (correct: $30 - 25 + 40 = 45$)

Question 2: Assume the following scenario. Participant A chooses a reward of 40 and a desired effort of 5. In the second stage, participant B chooses an effort of 1. Then the computer selects -1 as a random number, so the performance of participant B is 0 ($1 - 1$). Then the computer displays to participant A that participant B's performance is 0. After observing this information, in the third stage, participant A chooses an adjustment of -50. What are participant A's earnings? _____(correct: $10 \times 0 - 40 - 5 = -45$) What are participant B's earnings? _____ (correct: $40 - 1 - 50 = -11$)]]

PART 2

On your computer screen you will see a square composed of 100 numbered boxes, like shown below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Behind one of these boxes hides a mine; all the other 99 boxes are free from mines. You do not know where this mine lies. You only know that the mine can be in any place with equal probability.

Your task is to decide how many boxes to collect. Boxes will be collected in numerical order. So you will be asked to choose a number between 1 and 100.

At the end of the experiment we will randomly determine the number of the box containing the mine. If you happen to have harvested the box where the mine is located – i.e. if your chosen number is greater than or equal to the drawn number – you will earn zero. If the mine is located in a box that you did not harvest – i.e. if your chosen number is smaller than the drawn number – you will earn in euro an amount equivalent to the number you have chosen.

[[[Extra sheet]]]

Effort	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cost of effort	0	1	2	5	8	13	18	25	32	41	50	61	72	85	98

Adjustment	-50	-40	-30	-20	-10	0	10	20	30	40	50
Cost of adjustment	5	4	3	2	1	0	1	2	3	4	5

Participant B's performance = effort [[[+ random number]]]

Participant A's earnings = $10 \times (\text{performance participant B}) - (\text{reward}) - (\text{cost of adjustment})$
 [[[= $10 \times (\text{effort of part. B} + \text{random number}) - (\text{reward}) - (\text{cost of adj.})$]]]

Participant B's earnings = $(\text{reward}) - (\text{cost of effort}) + (\text{adjustment})$

3 Treatment D

[[[These are the instructions for the no-shock treatment. When instructions are adapted to the shock treatment, this is adapted accordingly, like in the S shock / no-shock treatments.]]]

PART 1

The role assignment

This part consists of 10 periods. In each period you are anonymously assigned to a group, which consists of two participants: participant A and participant B. At the beginning of the first period you will be randomly assigned either as participant A or participant B. You will remain in the same role throughout part 1 of the experiment. So, if you are assigned as participant B in the first period, then you will stay as participant B throughout the 10 periods of part 1.

Independently on your role, at the beginning the first and at the beginning of the second block you are randomly assigned another participant in the other role. For one block (five periods), respectively, you are assigned the same partner. That is, if you are participant B, for the first five periods you get assigned one participant A; for the following five periods you get assigned another participant A.

[[[Stage 1, Stage 2, and Stage 3 is as in the S treatment.]]]

4 Treatment NRG

[[[These are the instructions for the no-shock treatment. When instructions are adapted to the shock treatment, this is adapted accordingly, like in the S shock / no-shock treatments.]]]

PART 1

The role assignment

This part consists of 10 periods. In each period you are anonymously assigned to a group, which consists of two participants: participant A and participant B. At the beginning of the first period you will be randomly assigned either as participant A or participant B. You will remain in the same role throughout part 1 of the experiment. So, if you are assigned as participant B in the first period, then you will stay as participant B throughout the 10 periods of part 1.

Independently on your role, at the beginning the first and at the beginning of the second block you are randomly assigned another participant in the other role. **For one block (five periods), respectively, you are assigned the same partner.** That is, if you are participant B, for the first five periods you get assigned one participant A; for the following five periods you get assigned another participant A.

Each period will proceed in three stages.

Stage 1

In stage 1, in periods 1 and 6, participant A will choose a reward (any integer number between 0 and 100) and a desired effort (any integer number between 0 and 14) for participant B. **The values chosen in this stage will apply for the following five periods, respectively!**

An example of the decision screen in stage 1 for participant A is shown below.

You are participant A

Stage 1

Choose an integer number between 0 and 100 as reward for participant B.

Choose an integer number between 0 and 14 for the desired effort of participant B.

The chosen values will apply for the following five periods!

OK

Stage 2

On the screen, participant B is shown the reward and the desired effort chosen by participant A. Then, participant B will choose an effort level (any integer number between 0 and 14). **Participant B chooses an effort level in each of the periods.**

An example of the stage 2 decision screen for participant B is shown below.

You are participant B

Stage 1

The **reward** is, as for all periods with this partner, **56**.

The **desired effort** is, as for all periods with this partner, **9**.

Stage 2

Choose an integer number between **0** and **14** as your **effort**.

OK

For each effort level chosen by participant B there is an associated cost of effort. The cost of effort can be found in the following table:

Effort	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cost of effort	0	1	2	5	8	13	18	25	32	41	50	61	72	85	98

Note that as effort rises from 0 to 14, costs rise exponentially.

Stage 3

After participant B chooses the effort level, the performance of participant B is determined as follows:

Participant B's performance = effort of participant B.

End of the period

At the end of each period, participant B will be shown the following information on the screen: the reward chosen by participant A, the desired effort chosen by participant A, the performance of participant B, and the earnings for that period – without the “adjustment” (more regarding the adjustment in the next stage). An example for the screen is shown on the following picture.

Once your earnings are displayed on the outcome screen as shown below you should record your earnings for the period on your personal record sheet under the appropriate heading.

You are participant B

Stage 1

The reward is 56.

The desired effort is 9.

Stage 2

The effort is 11.

The cost of the effort is 61.

The income of this period is -5.00 Token.

There will be added the adjustment, which is chosen at the end of these 5 periods.

End of the block: the adjustment

At the end of each block – hence, at the end of periods 5 and 10 – the computer shows participant A **the average performance** of the previous five periods. Then participant A can choose an adjustment level. The adjustment level must be a multiple of 10, between -50 and 50.

An example of the decision screen at the end of the block is shown below. **Participant A chooses an adjustment twice: At the end of period 5, and at the end of period 10.**

You are participant A

Stage 1

The reward is 56.

The desired effort is 9.

Stage 2

The average performance of the last five periods was 9.80.

Stage 3

Choose a multiple of 10, between -50 and 50, as adjustment:

OK

For each adjustment level chosen by participant A there is an associated cost of adjustment. The cost of adjustment can be found in the following table:

Adjustment	-50	-40	-30	-20	-10	0	10	20	30	40	50
Cost of adjustment	5	4	3	2	1	0	1	2	3	4	5

Earnings

At the end of the experiment **one of the 10 periods** is randomly chosen for payment. In this period, the reward of participant A, the effort and the resulting performance of participant B, and the adjustment paid at the end of the respective block as well as the arising costs are used to calculate the incomes. In detail, the incomes are composed as follows:

Earnings of participant A in the respective period

The earnings of participant A depends on three factors: on the reward chosen by participant A, the performance of participant B, and the adjustment chosen by participant A:

$$\text{Participant A's earnings} = 10 * (\text{performance participant B}) - (\text{reward}) - (\text{cost of adjustment})$$

Higher participant B's effort implies higher participant B's performance, and thus higher participant A's earnings. On the other hand, a higher reward or a higher cost of adjustment implies lower participant A's earnings.

Earnings of participant B in the respective period

The earnings of participant B depend on three factors: the reward chosen by participant A, the effort chosen by participant B; and the adjustment chosen by participant A:

$$\text{Participant B's earnings} = (\text{reward}) - (\text{cost of effort}) + (\text{adjustment})$$

A higher reward chosen by participant A implies higher participant B's earnings. On the other hand, a higher effort implies higher effort costs and therefore lower participant B's earnings. If participant A chooses a positive adjustment level for participant B then participant B's earnings increase by that adjustment level. However, if participant A chooses a negative adjustment level then participant B's earnings decrease by that adjustment level.

Example 1

Assume the following scenario. At the beginning of the first block, participant A chooses a reward of 50 and a desired effort of 7.

In period 1, participant B chooses an effort of 5, hence the performance is 5.

In period 2, participant B chooses an effort of 7, hence the performance is 7.

In period 3, participant B chooses an effort of 4, hence the performance is 4.

In period 4, participant B chooses an effort of 6, hence the performance is 6.

In period 5, participant B chooses an effort of 8, hence the performance is 8.

After the first block, hence at the end of period 5, the computer displays to participant A that participant B's average performance is 6. Then, participant A chooses an adjustment of -40. The computer chooses period 4 for payment.

The earnings from participant A in this period is: $10 \cdot 6 - 50 - 4 = 6$: participant B's performance is 6, the reward is 50, and the cost of the adjustment is 4.

The earnings from participant B in this period is: $50 - 18 - 40 = -8$: the reward is 50, the cost of effort of 6 is 18, and the adjustment is -40.

Example 2

Assume the following scenario. At the beginning of the second block, participant A chooses a reward of 40 and a desired effort of 6.

In period 6, participant B chooses an effort of 9, hence the performance is 9.

In period 7, participant B chooses an effort of 7, hence the performance is 7.

In period 8, participant B chooses an effort of 9, hence the performance is 9.

In period 9, participant B chooses an effort of 11, hence the performance is 11.

In period 10, participant B chooses an effort of 9, hence the performance is 9.

After the second block, hence at the end of period 10, the computer displays to participant A that participant B's average performance is 9. Then, participant A chooses an adjustment of 30. The computer chooses period 8 for payment.

The earnings from participant A in this period is: $10 \cdot 9 - 40 - 3 = 47$: participant B's performance is 9, the reward is 40, and the cost of the adjustment is 3.

The earnings from participant B in this period is: $40 - 41 + 30 = 29$: the reward is 40, the cost of effort of 9 is 41, and the adjustment is 30.

Important notes

Remember you have already received a €9.00 participation fee. In part 1 of the experiment, depending on a period, you may receive either positive or negative earnings. The income from the randomly chosen period will be converted in Euros. If the earnings are negative, we will subtract them from your total earnings. If the earnings are positive, we will add them to your total earnings. Are there any questions?

Control questions *[[[implemented in z-Tree]]]*

Question 1: A) Assume that in period 1 you get assigned the role of participant A. Will your role change in period 2? B) Assume in period 1 you get assigned the role of participant B. For how many periods will you be with the same participant A?

Question 2: Assume the following scenario. Participant A chooses a reward of 30 and a desired effort of 8.

In period 1, participant B chooses an effort of 6. Hence the performance is 6. [[[Then the computer selects 1 as a random number, so the performance of participant B is 7 (6 +1).]]]

In period 2, participant B chooses an effort of 7. Hence the performance is 7. [[[Then the computer selects 0 as a random number, so the performance of participant B is 7 (7 +0).]]]

In period 3, participant B chooses an effort of 9. Hence the performance is 9. [[[Then the computer selects -2 as a random number, so the performance of participant B is 7 (9 -2).]]]

In period 4, participant B chooses an effort of 10. Hence the performance is 10. [[[Then the computer selects 1 as a random number, so the performance of participant B is 11 (10 +1).]]]

In period 5, participant B chooses an effort of 8. Hence the performance is 8. [[[Then the computer selects 2 as a random number, so the performance of participant B is 10 (8 +2).]]]

Then the computer displays to participant A that participant B's average performance is. After observing this information, participant A chooses an adjustment of 20.

Assume period 2 is chosen for payment.

What are participant A's earnings? -----(correct: $10 \cdot 7 - 30 - 2 = 38$) What are participant B's earnings? ----- (correct: $30 - 25 + 20 = 25$)