Supplementary Material

Incentivizing public good provision through outsider transfers: experimental evidence on sharing rules and additionality requirements
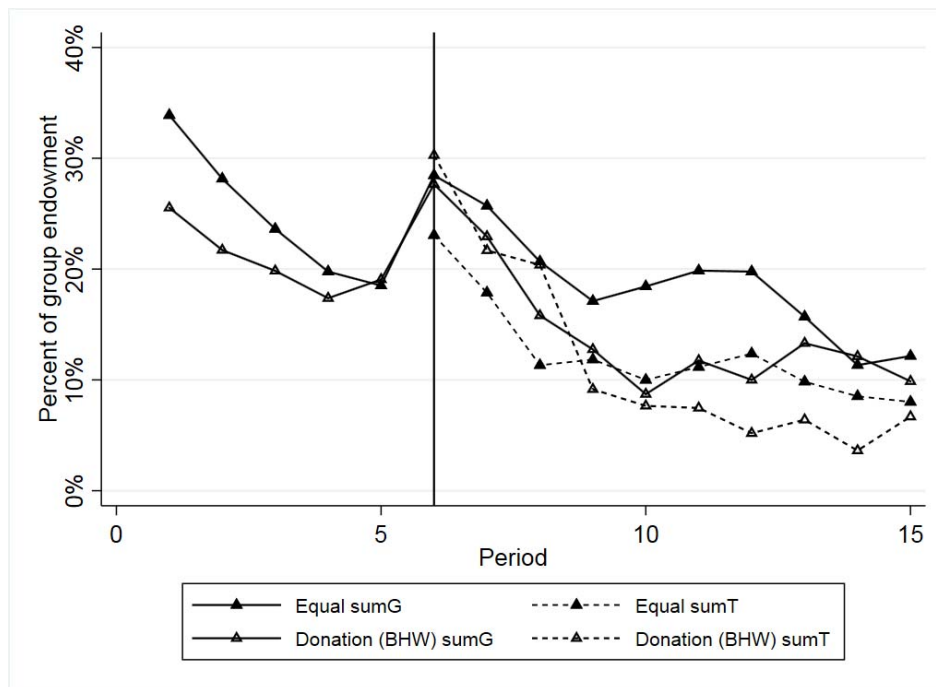
1. Comparison of Equal and Donation (BHW)

Fig SM1. *Average group contributions and transfers in the Equal and Donation (BHW) treatment across periods*

Table SM1. *Treatment effects for net group contributions and net group transfers in the Equal and Donation (BHW) treatment*

In % of group endowment:	(I) Net group contributions	(II) Net group transfers
Equal	0.346	-3.536
	(1.871)	(7.578)
Period	-1.576***	-1.618***
	(0.394)	(0.243)
Constant	10.34***	8.140
	(4.267)	(7.935)
Observations	*1120*	*1120*
Number of sessions	*10*	*10*
Number of groups	*28*	*28*
Reference Category	*Donation (BHW)*	

Note: Robust standard errors in parentheses. *** p<0.005, ** p<0.05, * p<0.1

2. Experimental Instructions

The instructions were in German. Below we present English translations. We first present the instructions on Part 1 of the experiment which is the same for all group payments and only present the relevant changes for Part 1 of the Equal (baseline2) and Targeted-transfers treatment. We then present instructions for Part 2 of the Equal treatment and the relevant word variations in Part 2 for all other group payment treatments. We further provide Part 2 of the Targeted-transfers treatment. All instructions are available from the authors upon request.

General Information

This is an experiment on decision making. You will have the chance to earn money based on your decisions and the decisions of others in your group. It is extremely important that you put away all materials including external reading material and turn off your cell phones. Now that the experiment has begun, we ask that you do not talk. If you have a question, please raise your hand and I will come by and answer your question privately. Please do not write in these instructions.

Your decisions will be recorded privately at your computer terminal. Your identity will never be disclosed to other participants.

Structure: This experiment consists of TWO PARTS, Part 1 and Part 2. This set of instructions details Part 1. The instructions for Part 2 will be provided after Part 1 is completed.

Cash Payment: Your earnings in this experiment are expressed in EXPERIMENTAL CURRENCY UNITS, which we will refer to as ECUs. At the conclusion of the experiment you will be paid privately in Euros using a conversion rate of €1 for every 200 ECUs of earnings from the experiment. Your total earnings from the experiment will be the sum of your total earnings from Part 1 and Part 2.

Information for Part 1 of the experiment

Part 1 is comprised of *5 decision periods*, each having the same structure. At the beginning of the section, you will be randomly and anonymously matched with 7 other participants to form a *group of 8*. You will remain in this same group for all of Part 1 and Part 2.

In every group there are *two types* of participants: 4 participants of Type A and 4 participants of Type B. Participant types are determined randomly. Your Type will remain unchanged for all of Part 1 and Part 2.

<u>Initial Endowments:</u>

Private Account: In each period, *participants* of *both types* receive an endowment of *100 ECUs* placed in their Private Account.

Group Account: In each period, each 8 person *group* begins with a Group Account of *0 ECUs*.

<u>Decision Tasks:</u>

Type A participants

Each Type A participant decides how many (if any) of the 100 ECUs he/she wants to allocate to the Group Account. Allocations can range from 0 to 100 ECUs in increments of 1 ECU. For every 1 ECU a Type A participant allocates to the Group Account, each of the 8 participants in his/her group receives 0.4 ECUs**.**

Type B participants

In every period Type B participants will estimate the amount allocated to the Group Account by the Type A participants. The estimate, however, does not have an effect on his/her payoff or the payoff of any group member and it will not be shared with members of their group.

Type B participants cannot make allocations to the Group Account.

<u>Period Earnings:</u>

Type A participants

The period earnings of Type A participants are the sum of the funds remaining in their Private Account after their allocations to the Group Account and the earnings from the Group Account.

Earnings Type A participants =
Private Account (Initial Endowment – Group Account allocations) + Group Account

Type B participants

The period earnings of Type B participants are the sum of their initial endowment of 100 ECUs and their earnings from the Group Account, which depends solely on the decisions of the Type A participants in their group.

Earnings Type B participants =
Private Account (Initial Endowment) + Group Account

Feedback: After every period, all group members will receive information on the total sum of allocations to the Group Account by Type A participants and on their individual earnings for the period.

TOTAL earnings: Your total earnings for Part 1 of the experiment will be the sum of your earnings in all periods of Part 1. Recall, at the conclusion of the experiment you will be paid in Euros using a conversion rate of €1 for every 200 ECUs of earnings from the experiment.

Example:

Suppose the four Type A participants allocate 0, 10, 50, and 90 ECUs respectively to the Group Account. Then the sum of group allocations is 150 and each group member receives 0.4x150=60 ECUs from the Group Account.

The individual payoffs per period of the Type A participants depend on the amounts they allocated to the Group Account:

- for the participant A who allocated 0: $(100 – 0) + 60 = 160$
- for the participants A who allocated 10: $(100 – 10) + 60 = 150$
- for the participants A who allocated 50: $(100 – 50) + 60 = 110$
- for the participant A who allocated 90: $(100 – 90) + 60 = 70$

The payoff per period for each participant of Type B is $100 + 60 = 160$

Control Questions for Part 1

1.1. The starting value of your *Private Account* is _____ ECUs.

Response: 100

1.2. The starting value of the initial *Group Account* is _____ ECUs.

Response: 0

1.3. Each ECU a Type A participant moves to the *Group Account* reduces the value of his *Private Account* by _____ ECUs.

Response: 1

1.4. Each ECU a Type A participant moves to the *Group Account* generates earnings from the Group Account for each member of his/her group of _____ ECUs.

Response: 0.4

1.5. If **every** Type A participant moves **100 ECUs** to the *Group Account*:

      a. Different Type A participants get <u>different</u> total earnings.

      b. Everyone's total earnings are <u>lower</u> than when all Type A participants move 0ECUs.

      c. Everyone's total earnings are <u>higher</u> than when all Type A participants move 0 ECUs.

Response: c.

1.6. If one Type A participant moves **more** ECUs to the *Group Account* than the other Type A participants:

      a. All Type A participants get the <u>same</u> total earnings.

      b. This participant gets <u>lower</u> total earnings than other Type A participants.

      c. This participant gets <u>higher</u> total earnings than other Type A participants.

Response: b.

1.7. Depending on the choices of Type A participants:

      a. Different Type B participants get <u>different</u> total earnings.

      b. All Type B participants get the <u>same</u> total earnings for any choice of Type A participants.

      c. Type B participants' total earnings <u>do not</u> depend on the choices of Type A participants.

Response: b.

Relevant variations in Equal(baseline2) and Targeted-transfers:

<u>Feedback</u>: After every period, all group members will receive information on the individual contributions to the Group Account by each Type A participant, the total sum of allocations to the Group Account and on their individual earnings for the period. Note that the individual allocation decision will be listed in random order in each period. This means, group members will not be able to know the behavior of specific individual Type A participants across periods.

Equal Treatment

Information for Part 2 of the experiment

Part 2 will consist of an additional *10 decision periods*. You remain in the *same group of 8 participants* as in Part 1. Your Type also remains unchanged. In this part, both participants of Type A and Type B make sequential decisions in every period.

The four Type B participants in a group make their decisions first. Next, the four Type A participants in a group make their decision.

Initial Endowments (same as in Part 1):

Private Account: In each period, *participants of both types* receive an endowment of *100 ECUs* placed in their Private Account.

Group Account: In each period, each 8 person *group* begins with a Group Account of *0 ECUs*.

Task 1:

Type B participants

Each Type B participant is now allowed to support the group of Type A participants in making allocations to the Group Account. That is, Type B participants can choose to make a transfer between 0 and 100 ECUs to a Transfer Account. The sum of transfers will be split equally among the Type A participants in the group before participants of Type A make their decisions. Type A participants should use the transfers sent by Type B participants to increase their allocations to the Group Account.

Type A participants

Each Type A participant will estimate the amount of ECUs transferred to the Transfer Account by the Type B participants. The estimate does not have an effect on his/her payoff or the payoff of any group member and it will not be shared with members of their group.

Task 2:

Type A participants

Each participant of Type A observes the total funds available in the Transfer Account and his/her individual share of the transfer.

Type A participants then decide how many (if any) of the 100 ECUs in his/her endowment he/she wants to allocate to the Group Account. Remember, Type A participants should use the transfers they receive from Type B participants to increase their allocations to the Group Account. As in Part 1, for every 1

ECU a Type A participant allocates to the Group Account, each of the 8 participants in his/her her group receives 0.4 ECUs.

Notice that transfers from Type B participants do not influence maximum possible allocations to the Group Account by participants of Type A, this remains constant at a maximum of 100 ECUs each decision round. However, the transfers made by Type B participants should be viewed as a way for Type B participants to support the Group Allocations made by Type A participants.

Type B participants

As in Part 1, in every period each Type B participant will estimate the amount of ECUs allocated to the Group Account by the Type A participants. Also as in Part 1, the estimate does not have an effect on his/her payoff or the payoff of any group member and it will not be shared with members of their group.

Type B participants cannot make allocations to the Group Account.

Period Earnings:

Type B participants

The period earnings of Type B participants are the sum of the funds remaining in their Private Account after their transfers to the Transfer Account and the earnings from the Group Account.

Earnings Type B participants =

Private Account (Initial Endowment - Transfers) +

Group Account

Type A participants

The period earnings of Type A participants are the sum of the funds remaining in their Private Account after their allocations to the Group Account, the earnings from the Group Account, and their earnings from the transfers made to the Transfer Account by Type B participants in their groups.

Earnings Type A participants =

Private Account (Initial Endowment - allocations) +

Group Account +

Equal share of total Transfers

Feedback: After every period, both types of participants will receive information on the funds available in the Transfer Account, the total funds available in the Group Account, and their individual earnings for this period.

TOTAL earnings: Your total earnings for Part 2 of the experiment will be the sum of your earnings in all periods of Part 2. Recall, at the conclusion of the experiment you will be paid in Euros using a conversion rate of €1 for every 200 ECUs of earnings from the experiment.

Example:

Suppose participants of *Type B* transfer 0, 10, 30, and 60 ECUs respectively to the Transfer Account.

Also suppose participants of *Type A* allocate 0, 10, 50, and 90 ECUs respectively to the Group Account.

Group Account: The sum of allocations made by Type A participants is 150. Each participant of Type A and Type B receives 0.4 x 150 = 60 ECUs from the Group Account.

Transfer Account: The sum of transfers from Type B participants is 100 ECUs and therefore each participant of Type A receives 100 / 4 = 25 ECUs from the Transfer Account.

The individual payoffs (in ECUs) per period of the Type A and B participants depend on the transfers and the amounts allocated to the Group Account:

- for the participant A who allocated 0: $(100 - 0) + 60 + 25 = 185$
- for the participants A who allocated 10: $(100 - 10) + 60 + 25 = 175$
- for the participants A who allocated 50: $(100 - 50) + 60 + 25 = 135$
- for the participant A who allocated 90: $(100 - 90) + 60 + 25 = 95$

- for the participant B who transferred 0: $(100 - 0) + 60 = 160$
- for the participant B who transferred 10: $(100 - 10) + 60 = 150$
- for the participant B who transferred 30: $(100 - 30) + 60 = 130$
- for the participant B who transferred 60: $(100 - 60) + 60 = 100$

Questions for Part 2

2.1. Each ECU a **Type B** participant moves to the *Transfer Account* reduces the value of his *Private Account* by _____ ECUs and increases the value of the *Private Account* of each Type A participant by _____ECUs.

Response: 1 , 0.25

2.2. Suppose in the total, the Type B participants move 200 ECUs to the *Transfer Account*. In this case

    a. Each Type A participant can move up to 150 ECUs to the *Group Account*.

    b. Each Type A participant can move up to 300 ECUs to the *Group Account*.

    c. Each Type A participant can move up to 100 ECUs to the *Group Account*.

Response: c.

2.3. If one **Type B** participant moves **more** ECUs to the *Transfer Account* than the other Type B participants:

        a. All Type B participants get the <u>same</u> total earnings.

        b. This participant gets <u>lower</u> total earnings than other Type B participants.

        c. This participant gets <u>higher</u> total earnings than other Type B participants.

Response: b.

2.4. Depending on the choices of Type B participants:

a. Different Type A participants get <u>different</u> transfers from the Transfer Account.

        b. All Type A participants get the <u>same</u> transfers from the Transfer Account.

        c. Type A participants' total earnings <u>do not</u> depend on the transfers to the Transfer Account.

Response: b.

Proportional Treatment

Relevant variations:

<u>Task 1:</u>

Type B participants

Each Type B participant is now allowed to support the group of Type A participants in making allocations to the Group Account. That is, Type B participants can choose to make a transfer between 0 and 100 ECUs to a Transfer Account.

The sum of transfers by Type Bs will be split proportionally among the Type A participants, depending on the individual contributions of each Type A participant relative to the total contributions to the Group Account.

That means, the higher the contribution to the Group Account by a Type A participant as compared to the other Type A participants, the larger the share this participant receives from the Transfer Account.

<u>Period Earnings:</u>

Type A participants

The period earnings of Type A participants are the sum of the funds remaining in their Private Account after their allocations to the Group Account, the earnings from the Group Account, and their earnings from the transfers made to the Transfer Account by Type B participants in their groups.

Earnings Type A participants =

Private Account (Initial Endowment - allocations) +

Group Account +

Proportional share $\left(\frac{my\ contribution}{Total\ Type\ A\ contributions}\right)$ of total Transfers

Equal (Add) Treatment

Relevant variations:

Task 1:

Type B participants

Each Type B participant is now allowed to support the group of Type A participants in making allocations to the Group Account. That is, Type B participants can choose to make a transfer between 0 and 100 ECUs to a Transfer Account.

If the sum of allocations to the Group Account by the Type A participants in the current period **exceeds the average** of the Group Account allocations of the Type A participants during Part 1, the Transfer Account will be distributed equally among the Type A participants.

If the sum of ECUs in the Group Account **does not exceed** the average Group Account allocations from Part 1, the ECUs in the Transfer Account will be returned to each Type B participants in accordance to their individual transfers.

Task 2:

Type A participants

Each participant of Type A observes the total funds available in the Transfer Account. Further, Type A participants observe the average amount of ECUs they allocated as a group to the Group Account during Part 1.

Each Type A participant then decide how many (if any) of the 100 ECUs in his/her endowment he/she wants to allocate to the Group Account. Only if the sum of allocations in a period are above the average of part I will Type A participants receive the transfers offered.

Period Earnings:

Type B participants

The period earnings of each Type B participant is the sum of the funds remaining in their Private Account after their transfers to the Transfer Account, their earnings from the Group Account, and their refund from the Transfer Account **if it is not shared** among the Type A participants.

Earnings Type B participants =

Private Account (Initial Endowment - Transfers) +

Group Account +

Potential refund from the Transfer Account

Type A participants

The period earnings of each Type A participant is the sum of the funds remaining in their Private Account after their allocation to the Group Account, their earnings from the Group Account, and their earnings from the transfers made to the Transfer Account by Type B participants in their group **if total Group Allocations in a round exceed the average Group Allocations from Part 1**.

Earnings Type A participants =

Private Account (Initial Endowment - allocations) +

Group Account +

Equal share of total Transfers (**conditional on Group Account allocations above part I**)

Feedback: After every period, both types of participants will receive information on the funds available in the Transfer Account, the total funds available in the Group Account, and their individual earnings for this period.

In addition, all participants will receive information on whether the sum of allocations by Type A participants was higher than the average of Part I.

Proportional (Add) Treatment

Relevant variations:

Task 1:

Type B participants

Each Type B participant is now allowed to support the group of Type A participants in making allocations to the Group Account. That is, Type B participants can choose to make a transfer between 0 and 100 ECUs to a Transfer Account.

If the sum of allocations to the Group Account by the Type A participants in the current period **exceeds the average** of the Group Account allocations of the Type A participants during Part 1, the Transfer

Account will be split proportionally among the Type A participants, depending on the individual contributions of each Type A participant relative to the total contributions to the Group Account.

That means, the higher the contribution to the Group Account by a Type A participant as compared to the other Type A participants, the larger the share this participant receives from the Transfer Account.

If the sum of ECUs in the Group Account **does not exceed** the average Group Account allocations from Part 1, the ECUs in the Transfer Account will be returned to each Type B participant in accordance to their individual transfers.

<u>Task 2:</u>

Type A participants

Each participant of Type A observes the total funds available in the Transfer Account. Further, Type A participants observe the average amount of ECUs they allocated as a group to the Group Account during Part 1.

Type A participants then decide how many (if any) of the 100 ECUs in his/her endowment he/she wants to allocate to the Group Account. Only if the sum of allocations in a period are above the average of part I will Type A participants receive the transfers offered.

<u>Period Earnings:</u>

Type B participants

The period earnings of Type B participants are the sum of the funds remaining in their Private Account after their transfers to the Transfer Account, their earnings from the Group Account and their refund from the Transfer Account **if it is not shared** among the Type A participants.

Earnings Type B participants =
Private Account (Initial Endowment - Transfers) +
Group Account +
Potential refund from the Transfer Account

Type A participants

The period earnings of Type A participants are the sum of the funds remaining in their Private Account after their allocations to the Group Account, the earnings from the Group Account, and their earnings from the transfers made to the Transfer Account by Type B participants in their group **if total Group Allocations in a round exceed the average Group Allocations from Part 1**.

Earnings Type A participants =

Private Account (Initial Endowment - allocations) +

Group Account +

Proportional share $\left(\frac{my\ contribution}{Total\ Type\ A\ contributions}\right)$ of total Transfers, (**conditional on Group Account allocations above the average of Part I**)

Feedback: After every period, both types of participants will receive information on the funds available in the Transfer Account, the total funds available in the Group Account, and their individual earnings for this period. Type A participants will also be informed of their share of the Transfer Account.

In addition, all participants will receive information on whether the sum of allocations by Type A participants was higher than the average of Part I.

Targeted-transfers Treatment

Information for Part 2 of the experiment

Part 2 will consist of an additional *10 decision periods*. You remain in the *same group of 8 participants* as in Part 1. Your Type also remains unchanged. In this part, both participants of Type A and Type B make sequential decisions in every period.

The four Type A participants in a group make their decisions first. Next, the four Type B participants in a group make their decision.

Initial Endowments (same as in Part 1):

Private Account: In each period, *participants of both types* receive an endowment of *100 ECUs* placed in their Private Account.

Group Account: In each period, each 8 person *group* begins with a Group Account of *0 ECUs*.

Task 1:

Type A participants

Type A participants decide how many (if any) of the 100 ECUs in his/her endowment he/she wants to allocate to the Group Account. As in Part 1, for every 1 ECU a Type A participant allocates to the Group Account, each of the 8 participants in his/her her group receives 0.4 ECUs**.**

Type B participants

Each Type B participant will estimate the amount of ECUs allocated to the Group Account by the Type A participants. The estimate does not have an effect on his/her payoff or the payoff of any group member and it will not be shared with members of their group.

Type B participants cannot make allocations to the Group Account.

<u>Task 2:</u>

Type B participants

Each participant of Type B observes the individual contributions by Type A participants, listed in random order. Each Type B participant is now allowed to support individual Type A participants for their allocations to the Group Account. Type B participants can choose freely on the transfers made to each individual Type A participant, as long as the sum of transfers sent is between 0 and 100 ECUs.

Notice that transfers from Type B participants should be viewed as a way for Type B participants to support the Individual Allocations made by Type A participants.

Type A participants

Each Type A participant will estimate the amount of ECUs he/she expects to receive in total from Type B participants. The estimate does not have an effect on his/her payoff or the payoff of any group member and it will not be shared with members of their group.

<u>Period Earnings:</u>

Type A participants

The period earnings of Type A participants are the sum of the funds remaining in their Private Account after their allocations to the Group Account, the earnings from the Group Account, and their earnings from the transfers they received from the Type B participants in their groups.

Earnings Type A participants =
Private Account (Initial Endowment - allocations) +
Group Account +
Individual Transfers received

Type B participants

The period earnings of Type B participants are the sum of the funds remaining in their Private Account after all their transfers to the Type A participants and the earnings from the Group Account.

Earnings Type B participants =
Private Account (Initial Endowment - Transfers)
+ Group Account

<u>Feedback</u>: After every period, all participants will receive information on the individual contributions to the Group Account by each Type A participant, the total sum of allocations to the Group Account and the Transfer Account, as well as their individual earnings for the period.

In addition, each Type A participant will be informed of the aggregate transfers he/she received from Type B participants.

Note that the individual decisions of Type A participants will be listed in random order. This means, group members will not be able know the behavior of specific individual Type A participants across periods.

TOTAL earnings: Your total earnings for Part 2 of the experiment will be the sum of your earnings in all periods of Part 2. Recall, at the conclusion of the experiment you will be paid in Euros using a conversion rate of €1 for every 200 ECUs of earnings from the experiment.

Example:

Suppose participants of *Type A* allocate 0, 10, 50, and 90 ECUs respectively to the Group Account.

Suppose the sum of transfers to individual Type A participants by the different *Type B* is 0, 10, 30, and 60 ECUs.

Further suppose they allocate their transfers so that the different Type A participants receive:

- for the participant A who allocated 0: 0 in transfers
- for the participant A who allocated 10: 5 in transfers
- for the participant A who allocated 50: 20 in transfers
- for the participant A who allocated 90: 75 in transfers

Group Account: The sum of allocations made by Type A participants is 150. Each participant of Type A and Type B receives 0.4 x 150 = 60 ECUs from the Group Account.

The individual payoffs (in ECUs) per period of the Type A and B participants depend on the amounts allocated to the Group Account, the return from the Group Account, and individual Transfers:

- for the participant A who allocated 0: $(100 - 0) + 60 + 0 = 160$
- for the participant A who allocated 10: $(100 - 10) + 60 + 5 = 155$
- for the participant A who allocated 50: $(100 - 50) + 60 + 20 = 130$
- for the participant A who allocated 90: $(100 - 90) + 60 + 75 = 145$

- for the participant B who transferred 0 in total: $(100 - 0) + 60 = 160$
- for the participant B who transferred 10 in total: $(100 - 10) + 60 = 150$
- for the participant B who transferred 30 in total: $(100 - 30) + 60 = 130$
- for the participant B who transferred 60 in total: $(100 - 60) + 60 = 100$

Questions for Part 2 of Targeted-transfers

2.1. Each ECU a **Type B** participant transfers to a Type A participant reduces the value of his *Private Account* by _____ ECUs and increases the value of the *Private Account* of the Type A participant by _____ECUs.

Response: 1 , 1

2.2. If one **Type B** participant transfers **more** ECUs to the Type A participants than the other Type B participants:

      a. All Type B participants get the <u>same</u> total earnings.

      b. This participant gets <u>lower</u> total earnings than other Type B participants.

      c. This participant gets <u>higher</u> total earnings than other Type B participants.

Response: b.

2.3. Depending on the choices of Type B participants:

      a. Different Type A participants can get <u>different</u> transfers.

      b. All Type A participants necessarily get the <u>same</u> transfers.

      c. Type A participants' total earnings <u>do not</u> depend on the transfers.

Response: a.