Pre-Analysis Plan

Procedural fairness and externalities under uncertainty

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I MOTIVATION

Many decisions people make have the potential to create positive externalities. This is especially the case for decisions that are made under uncertainty: Starting a business, developing new technologies, or investing into new ventures, are all decisions that involve uncertainty about personal gains and losses, but have potential positive externalities for wider society. For example, a successful entrepreneur may create jobs, knowledge spillovers, or improve welfare through her products and services. The likelihood of a person choosing such entrepreneurial activities is however affected by whether and how societies reward this decision.[1] One channel that may affect such rewards are individuals' distributive preferences. If individuals hold a preference to reward risk takers who create positive externalities for society, then this creates demand for policies in line with such preferences. How potential externalities affect distributive preferences is however an open question. In this study, I will provide a theoretical framework and a first experimental test of how potential externalities affect distributive preferences when income is earned under uncertainty.

II EXPERIMENTAL DESIGN

My basic experimental design follows in particular Cappelen et al. (2013) by asking an impartial spectator to decide on a fair allocation of a monetary bonus between two decision makers. Prior to spectators making their distributive choice, decision makers have to choose between a lottery and a safe income. In the treatment condition, choosing the lottery does not just yield a potentially high reward for the decision maker if successful, but might also result in positive externalities for the participant pool.

Stage 1: Participants recruited via Prolific Academic participate in either the control or treatment condition that determines individual payoffs.

> **Control:** Subjects are asked to decide between the following two options seven times, one choice being randomly selected for payment, each time with a slightly different value for option 1:
> *Option 1:* \$0.5/\$1/\$1.5/\$2/\$2.5/\$3/\$3.5
> *Option 2:* A 50% chance to receive \$4 and a 50% chance to receive \$0.
>
> **Treatment:** Subjects are asked to decide between the following two options seven times,

[1] For example, providing entrepreneurs with tax breaks has been shown to incentivise similar entrepreneurial activities (e.g. Djankov et al. 2010; Da Rin et al. 2011; Venâncio et al. 2020).

one choice being randomly selected for payment, each time with a slightly different value for option 1:

Option 1: \$0.5/\$1/\$1.5/\$2/\$2.5/\$3/\$3.5

Option 2: A 50% chance to receive \$4 and a 50% chance to receive \$0. Irrespective of the outcome of the lottery, there is a 50% chance that an externality of \$2 will generate which will be used to reward two randomly chosen participants from other studies.

Stage 2: Participants are paired based on the procedure outlined in IV.2 and one of the seven decisions subjects made is randomly chosen to determine payoffs. Each pair consists of a subject that chose the lottery and a subject that chose the safe option for the randomly selected decision. This is however unknown to subjects prior to making their choice, to ensure that subjects cannot make strategic decisions about the likely composition of the pair. Importantly, only subjects within the same treatment condition are matched.

Stage 3: Impartial Spectators, who have not participated in the first two stages of the experiment, are asked to allocate a windfall bonus of \$4 between pairs of decision makers in one control and two treatment conditions. Each spectator makes allocation decisions in all three conditions, but the order in which spectators see these conditions is randomized:

Control condition: Spectators allocate the \$4 between pairs of decision makers from the control group in stage 1. They receive full information of the choices made and the resulting earnings of each decision maker.

Ex ante treatment condition: Spectators allocate the \$4 between pairs of decision makers from the treatment group in stage 1. They receive full information of the choices made and on the resulting earnings of the decision makers but no information on whether the externality realised or not.

Ex post treatment condition: Spectators allocate the \$4 between pairs of decision makers from the treatment group in stage 1. They receive full information of the choices made, the resulting earnings of the decision makers, and on whether the externality realised or not.

Figure 1 shows example scenarios spectators might face during the experiment. Importantly, spectators only compare the decisions of two subjects for the same choice set, i.e., the choices made when faced with the same safe and risky option. They also do not have the option to communicate with the participants.

Overall, spectators make 20 such allocation decisions - 5 in the control condition, 5 in the

Figure 1: Example Spectator Scenarios in Control & Treatments

Notes: These figures illustrate example screens spectators face during the experiment. The top left panel shows a control condition scenario, the top right panel shows an ex ante treatment condition scenario, and the two bottom panels show ex post treatment scenarios with different outcomes for the lottery over the externality. For comparability, the personal lottery decision makers faced and its outcome is identical and positive in all four cases.

ex ante treatment condition, and 10 in the ex post treatment condition - with 19 being hypothetical and one resulting in actual payoffs for a participant pair. Spectators however do not know which of the allocation decisions will result in actual payoffs when making their decisions.[2]

III RESEARCH QUESTION AND HYPOTHESES

The primary research question of this study is *'How do positive externalities affect distributive choices for income earned under uncertainty?'*. I make several theoretical predictions:

Hypothesis 1a: The share of the bonus allocated to the subject choosing the lottery is higher in the ex ante treatment than in the control condition.[3]

Hypothesis 1b: The treatment effect in H1a increases as the value of the safe option A increases.[4]

Hypothesis 2a: The ex post treatment effects in H1a and H1b are larger when the externality realised than when it did not.

Hypothesis 2b: The ex post treatment effects in H1a and H1b are larger when the personal lottery was unsuccessful than when it was successful.

While not central to the main research question of this study, the first stage of the experimental design also allows me to test whether the choices made by decision makers are affected by the potential positive externalities of the risky option. H3 follows:

Hypothesis 3: Decision makers are more risk seeking in the treatment than in the control group.

[2]This method is commonly used in experimental designs to increase the number of observed choices without affecting the behaviour of the subjects (Charness et al. 2016).

[3]That is, if the difference between the expected size of the externality and the expected personal benefit from choosing the risky option is positive or zero. Therefore, H1 will primarily be tested for decisions where option A $>$ \$1.

[4]This effect could be nonlinear as it may be particularly strong in those cases where the EMV of the lottery is smaller than the EMV of the safe option (when the safe option is $>$ \$2). That is, because risk takers incur an actual cost to their own expected payoff in those instances which spectators may wish to compensate.

H3 also provides a further justification for providing spectators with hypothetical as well as real decision scenarios, given that the distribution of choices is expected to be different in the treatment as opposed to the control group.

IV SAMPLING

Based on a power analysis conducted in appendix A, a minimum total number of 840 spectator decisions is required for each control and treatment condition to achieve a power target of 0.9. Given that each spectator makes at least five individual allocation decisions for each condition, and to allow for potential attrition or other unforeseeable circumstances, a total of 180 spectators and 360 decision makers will be recruited. Of those 360 decision makers, 120 will be randomly allocated to the control group and 240 to the treatment group. This results in 3600 individual spectator decisions with 180 of those decisions determining the actual payoff of pairs of decision makers.

Spectators and decision makers will be recruited via Prolific Academic and the experiment will be coded in Qualtrics. Randomization will be done automatically via Qualtrics.

IV.1 Participation Criteria

Prolific Academic allows to restrict participation based on pre-defined critera. I will restrict participation to the following subjects:

1. Those currently resident in the United States.
2. Subjects who have not participated in the pilot study.

Additionally, I will exclude subjects from the main analysis if they have not completed all seven (or 20 for spectators) decisions.

IV.2 Matching of Decision Maker Pairs

As decision maker pairs have to consist of a person who chose the certain option A and a person who chose the risky option B for a given amount of option A, the matching of pairs will be conducted as follows:

1. Decision makers are grouped based on the first decision they saw during the experiment (the order of decisions is randomized for each subject).

2. Decision makers within each group receive a random number from a subset, depending on the choice they made for the given decision (either option A or option B).

3. Decision makers with the same numbers in the option A and option B subsets are paired.

4. Those decision makers who could not be paired are allocated to new groups based on the second decision they saw during the experiment.

5. Steps 2-4 are repeated until all decision makers are paired or all 7 decisions are exhausted for matching. In that case, the remaining decision makers are paired randomly with a random decision being selected, even if both decision makers chose the same option for this decision, and spectators are asked to decide on the allocation of the bonus between those pairs. These decisions may be used for additional analysis.

V EMPIRICAL STRATEGY

V.1 Main Outcome Variable

The main outcome variable of interest to test hypotheses 1a-2b is the share of the bonus allocated to the subject in the decision pair who chose the risky option B. This is denoted as y_r and is equal to \$4-y_s, whereby y_s is equal to the share of the bonus allocated to the subject who chose the safe option A. Spectators can choose values with up to two decimal points to allow for sufficient variation in spectator choices.

V.2 Hypothesis Testing

To estimate average treatment effects, I plan to use non-parametric Wilcoxon rank-sum tests. Additionally, I will run simple regression models with spectator-fixed effects to account for the fact that each spectator contributes 20 individual observations in my sample.
To test H1a, I then estimate the following simple model:

$$y_{r,d} = \alpha + \delta_1 TA_{r,d} + \epsilon_{r,d} \tag{1}$$

Here, α is equal to the share of the bonus y_r the risk-taking decision maker receives in the control condition where no externalities are present for a given decision d. δ_1 is then equal to the effect of the ex ante treatment condition ($TA_{r,d}$) on y_r. As I expect δ_1 to only be positive if the difference between the size of the expected externality and the benefit of choosing the lottery is positive, I restrict the above analysis to those decisions where option A > \$1.
To test H1b, I estimate the below model:

$$y_r = \delta_2 TA_r \times d_r + \epsilon_r \tag{2}$$

Here, δ_2 is equal to the combined effect of a \$1 increase in the safe option A and being in the ex ante treatment as opposed to the control condition on the share of the bonus y_r the risk-taking decision maker receives. H1b predicts that δ_2 will be positive.

To test H2a and H2b I will estimate the following models:

$$y_r = \delta_3 TP_r \times e_r + \epsilon_r \tag{3}$$

$$y_r = \delta_4 TP_r \times l_r + \epsilon_r \tag{4}$$

Here, e_r and l_r are binary variables equal to 1 if the externality or personal lottery of the risk-taking subject realised, respectively. TP_r now refers to the ex post treatment condition. H2a predicts a positive δ_3 in equation 3 and H2b predicts a negative δ_4 in equation 4.

I will also test whether the effect predicted by H1b, and estimated in equation (2), increases when the externality realised as predicted by H2a; and whether it decreases when the personal lottery did not pay off, as predicted by H2b. To this end, I will estimate the following models:

$$y_r = \delta_5 TP_r \times d_r \times e_r + \epsilon_r \tag{5}$$

$$y_r = \delta_6 TP_r \times d_r \times l_r + \epsilon_r \tag{6}$$

Here, e_r and l_r are again binary variables equal to 1 if the externality or personal lottery of the risk-taking subject realised, respectively. TP_r again refers to the ex post treatment condition. H2a predicts a positive δ_5 in equation 5 and H2b predicts a negative δ_6 in equation 6.

Finally, to test H3, I will calculate the proportion of decision makers who chose the risky option B for each level of option A and conduct a Pearson's chi-squared test of the frequency distributions for the treatment and control groups.

V.3 Exploratory Analysis of potential mechanisms

If the previously outlined analysis supports H1a and y_r is larger in the (ex ante) treatment than control group, I plan to explore the underlying potential mechanisms for such an effect by testing whether spectator beliefs (B1-B9) differ significantly between the treatment and control conditions.

I further plan to estimate whether spectators follow particular fairness ideals following Cappelen et al. (2013). Specifically, I will estimate the probability of spectators following an ex ante (choice egalitarian), or ex post (inequality averse) fairness ideal in their allocation de-

cisions. I will then estimate whether the distribution of these fairness ideals differs between treatment and control conditions. I will also test whether the presence of externalities might create a trade-off between the fairness ideal of a spectator and a desire to reward the risk-taking decision maker. To this end, I will develop a theoretical model building on the model developed by Cappelen et al. (2007, 2013, 2016) and structurally estimate its parameters.

V.4 Heterogeneity Analysis

I plan to test for heterogeneous treatment effects along the following dimensions:

1. Level of confidence in distributive choice
3. Gender (D2)
4. Education level (D4)
5. Household income (D5)
6. Political left-right placement (D8)
7. Party affiliation (D9)
8. Risk preferences (D11)
9. Ambiguity aversion (D12)

VI ETHICS

This study has received ethical approval from King's College London. The reference number is MRSP-21/22-30100. No deception is being used in this experiment and no information is collected that would allow subjects to be personally identified.

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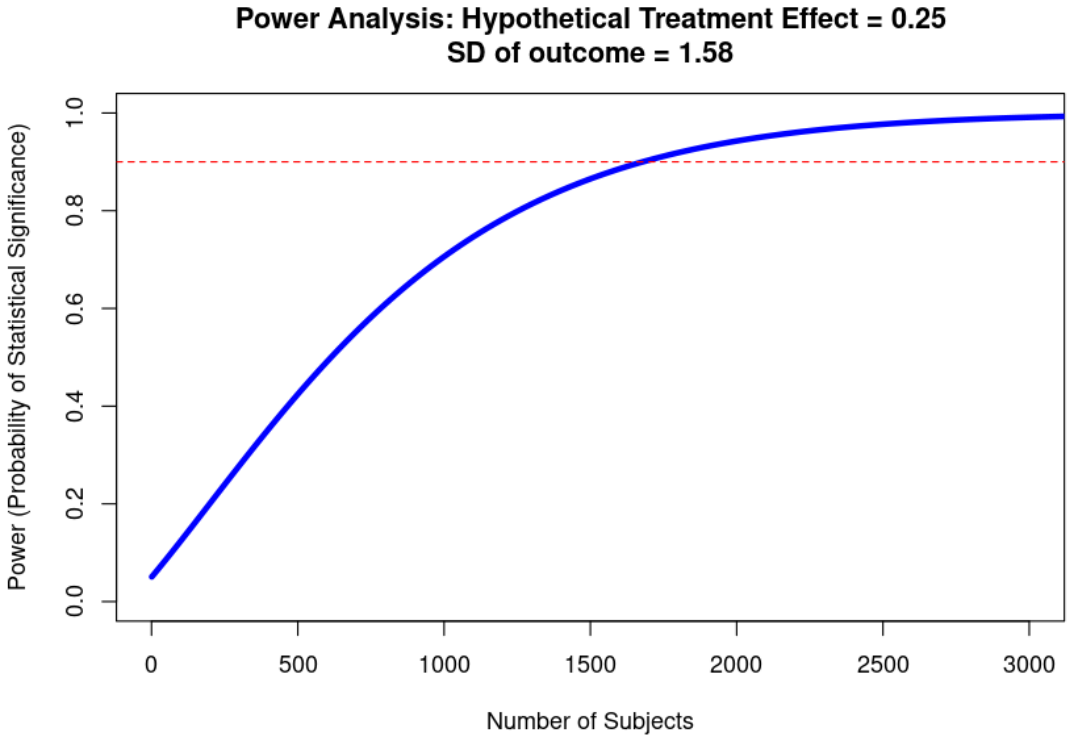
A POWER ANALYSIS

Using the results of a pilot study conducted in December 2021, a simple power analysis can be conducted to estimate the required sample size for the main experiment. While none of the treatment effects reached conventional levels of significance in the pilot, the coefficients ranged from 0.298 to 0.598. I therefore assume a conservative treatment effect of 0.250, an alpha of 0.05 and use the standard deviation of the main outcome variable of 1.58 observed in the pilot sample. The figure below reports the required sample size for a given level of statistical power. To reach statistical power of 0.9 a sample size of at least 1679 is required. Importantly, all of the hypotheses tests will be conducted between the control condition and only one of the two treatment condition. Therefore, a total of 840 observations per control and treatment condition are required.



B EXPERIMENTAL INSTRUMENT

B.1 Stage I: Decision Makers

Decisions 1-7 are presented in randomized order during the experiment and vary in the amount of the certain option A (from \$0.5 in Decision 1 to \$3.5 in Decision 7). Below, only decision 3 (with a certain option of \$1.50) is shown as an example. Text which is only shown in the treatment condition is highlighted.

Introduction:
Thank you for participating in this study. In the following, you will be asked to make a number of decisions that will influence the bonus payment you can receive for this study. Specifically, you will be asked seven times to decide between two options. Option A is always a certain payment while option B is a lottery with a potentially higher payoff. If you choose option B and irrespective of the outcome of the lottery, there is also a 50% chance that an additional \$2 will generate. If this is the case, we will use these \$2 to reward two randomly chosen participants from other studies. Below is an example decision you might face:

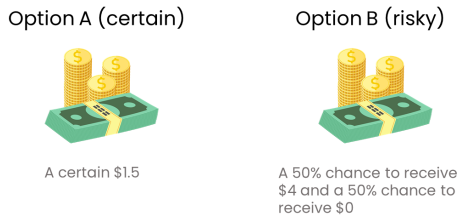


Figure B1a: Control Screen

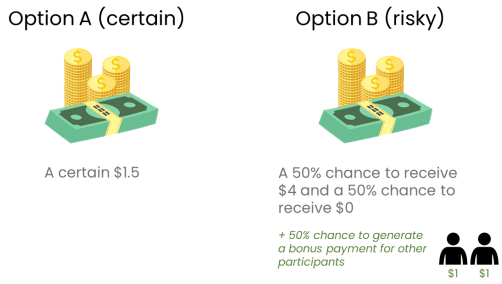


Figure B1b: Treatment Screen

While option B will remain the same throughout the seven decisions, the value of option A, which is a certain payment, will vary.

After you made your decisions, you will be paired with another participant and **one of the decisions** you made will be randomly selected to determine your bonus payment. All of the seven decisions you make have an equal chance of being selected for payment.

You will then be asked a set of questions about yourself and about the choices you just made.

Before you receive your bonus payment, a third participant will have the option to allocate an **additional $4** between you and the other participant as they wish. Depending on the choices you make and the decision of the third participant, you can therefore receive **a total of $8 in bonus payments** in this study. To receive a bonus payment, you need to complete the full study. This should take about 10 minutes.

Understanding:
Before you make your first decision, please answer the following questions. Your final payment will not depend on your answers to these questions. However, please answer to the best of your ability as your answers will impact the quality of our research.[5]

U1: How many decisions are you asked to make?

- 5
- 7
- 10
- Don't know

U2: Which one of the two options remains the same throughout the decisions?

- The certain option A
- The risky option B
- Don't know

U3: What will determine your final bonus payment? Please select all that apply.

- The sum of all the choices you make
- One randomly selected choice
- The allocation decision of $4 by a third participant between you and the other participant in your pair
- The sum of all the choices made by the other participant in your pair
- Don't know

[5] After subjects have submitted their answers to U1-U4, the correct answers will be displayed before they can proceed to the next page.

U4: If you choose the risky option B, how high is the chance that $2 will generate that we will use to pay additional participants?

- 0%
- 25%
- 50%
- 75%
- 100%
- Don't know

Example Decision:

Please carefully consider the below two options. The option you choose has a chance of 1 in 7 to determine your bonus payment for this study. Once you leave this screen, you cannot change the decision you made. Please remember that if you choose option B and irrespective of the outcome of the lottery, there is also a 50% chance that an additional $2 will generate that will be used to reward two randomly chosen participants from other studies. Which option would you like to choose?

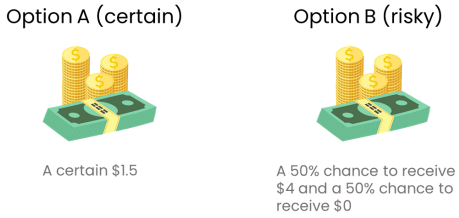


Figure B2a: Control Screen

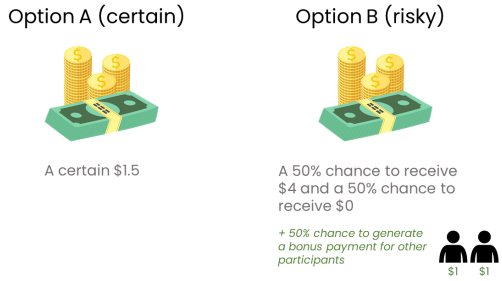


Figure B2b: Treatment Screen

Confidence: On a scale from 0 to 10, please indicate how confident you are in the decision you just made.

Reasoning Questions:

J1: Please explain your reasoning for the decisions you just made:

J2: Did you choose option B in any of the decisions:

- Yes
- No

J3: *[if previous question Yes]* Why did you choose option B in those cases? Please select all that apply.

- To maximise my own payoff
- To generate the additional $2 for the other participants
- To influence the allocation decision of the $4 by the third participant
- Other

J4: Which of the reasons you selected for choosing option B was most important for your decision making?

- To maximise my own payoff
- To generate the additional $2 for the other participants
- To influence the allocation decision of the $4 by the third participant
- Other
- All were of equal importance

Belief Questions:

B1: Please assume for now that the below decision will get selected for payment and the other participant in your pair did not choose the same option as you. Remind yourself of the choice you made. How much of the additional $4 do you expect the third participant would allocate to you in this case if they were fully informed about your and the other participant's choices?

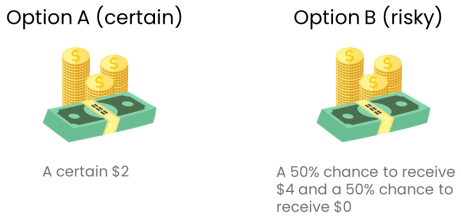


Figure B3a: Control Screen

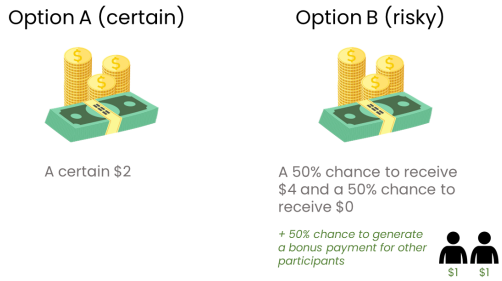


Figure B2b: Treatment Screen

Confidence: On a scale from 0 to 10, how confident are you in the estimate you just provided?

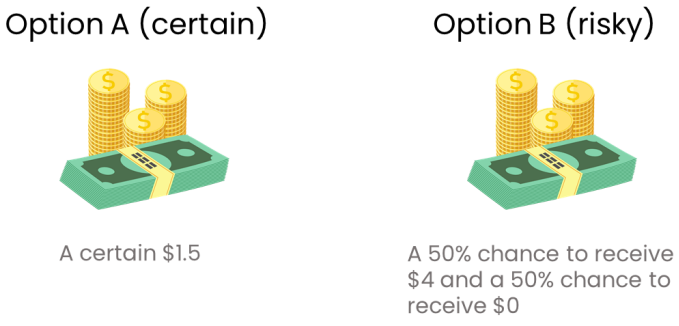
B2: On a scale from 0 to 10, how much autonomy do you feel you have over your final earnings?

B.2 Stage II: Spectators

Decisions 1-20 are presented in randomized order during the experiment. Below, one decision from each treatment and control condition is shown as an example.

Introduction:
Thank you for participating in this study. In the following, you will be asked to decide on an allocation of money between two participants. You will be asked to make a total of 20 allocation decisions. While 19 of these decisions are hypothetical, 1 will determine the actual payment for a participant pair. Please consider each decision carefully as we will not inform you about which of the 19 decisions is the one that determines actual payoffs for the two participants. After making the 20 allocation decisions you will be asked a set of questions about yourself and about the choices you just made. You will also have the opportunity to earn an additional bonus payment.

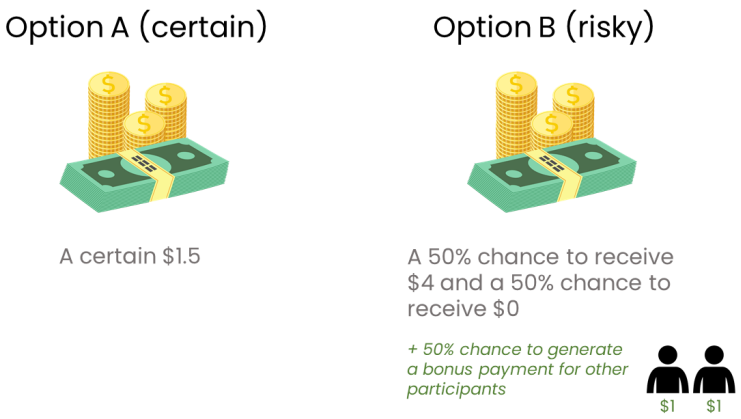
Control Condition:
You will now be asked to make your first/next five allocation decisions. All of the participants within the pairs already had the chance to receive an income based on a choice they were asked to make. Specifically, they were asked to decide between two options. Option A is always a certain payment while option B is a lottery with a potentially higher payoff. Below is an example of a decision they might have faced:



While option B always remains the same across all potential scenarios you will face, the value of option A, which is a certain payment, may vary. You will be informed about **the decision the participants faced, the choice they made, and their resulting current earnings**. You then have the option to allocate an additional $4 between the pair.

Ex ante Treatment Condition:

You will now be asked to make your first/next five allocation decisions. All of the participants within the pairs already had the chance to receive an income based on a choice they were asked to make. Specifically, they were asked to decide between two options. Option A is always a certain payment while option B is a lottery with a potentially higher payoff. If a participant chose option B and irrespective of the outcome of the lottery, there was also a 50% chance that an additional $2 generated. In these cases, the $2 have been used to reward two randomly chosen participants from other studies. Participants were aware of this possibility when making their decisions. Below is an example of a decision they might have faced:

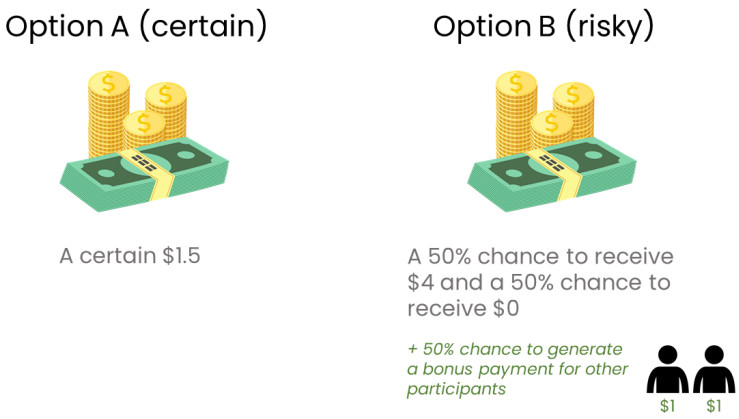


While option B always remains the same across all potential scenarios you will face, the value of option A, which is a certain payment, may vary. You will be informed about **the decision the participants faced, the choice they made, and their resulting current earnings** but **not** about whether the **additional $2** generated. You then have the option to allocate an additional $4 between the pair.

Ex post Treatment Condition:

You will now be asked to make your first/next ten allocation decisions. All of the participants within the pairs already had the chance to receive an income based on a choice they were asked to make. Specifically, they were asked to decide between two options. Option A is always a certain payment while option B is a lottery with a potentially higher payoff. If a participant chose option B and irrespective of the outcome of the lottery, there was also a 50% chance that an additional $2 generated. In these cases, the $2 have been used to reward two randomly chosen participants from other studies. Participants were aware of

this possibility when making their decisions. Below is an example of a decision they might have faced:



While option B always remains the same across all potential scenarios you will face, the value of option A, which is a certain payment, may vary. You will be informed about **the decision the decision the participants faced, the choice they made, their resulting current earnings, and whether the additional $2 generated**. You then have the option to allocate an additional $4 between the pair.

Understanding:

Before you make your first decision, please answer the following questions. Your final payment will not depend on your answers to these questions. However, please answer to the best of your ability as your answers will impact the quality of our research.[6]

U1: How many decisions are you asked to make in total?

- 10
- 20
- 30
- Don't know

U2: Which one of the two options remains the same throughout the decisions?

[6] After subjects have submitted their answers to U1-U4, the correct answers will be displayed before they can proceed to the next page.

- The certain option A
- The risky option B
- Don't know

U3: How many of your decisions will result in an actual payment for the two participants?

- 0
- 1
- 5
- 10
- Don't know

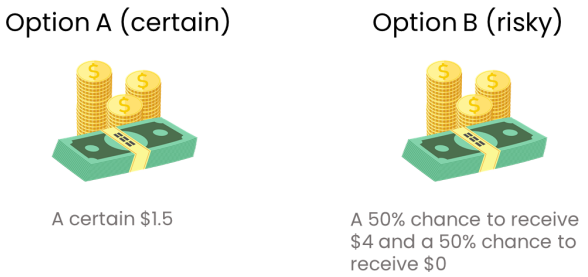
U4: If a participant chose the risky option B, how high is the chance that \$2 will generate that we will use to pay additional participants?[7]

- 0%
- 25%
- 50%
- 75%
- 100%
- Don't know

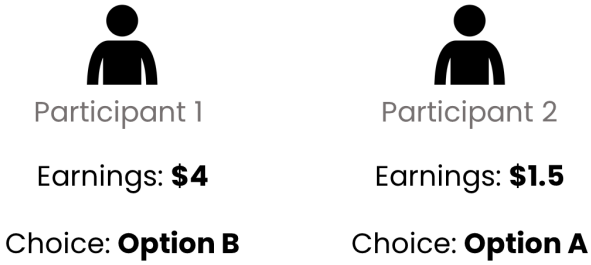
Reminder:
You will now make five/ten allocation decisions. Please remember that one of your decisions will determine the real payment of two individuals who participated in this study.

[7]This questions is displayed together with U1-U3 if spectators are randomly allocated to see one of the treatment conditions first. If spectators see the control conditions first, this question is displayed on its own after the introduction of the second condition.

Control Decision Example:
Please carefully consider the below scenario. Participant 1 and 2 both faced the following decision:



The outcomes for both participants and the choices they made are given below:



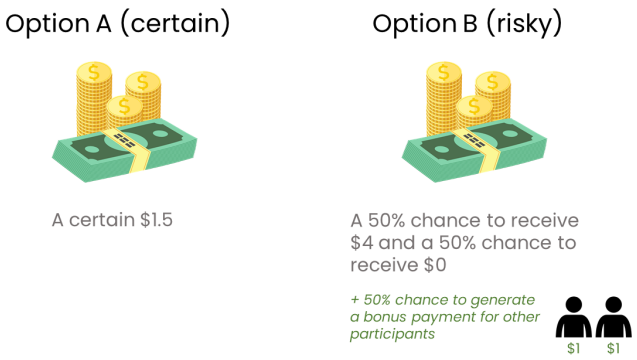
You are now asked to allocate an additional amount of money between the pair. You can allocate this money as you wish. Please note, you have to allocate the total amount of $4.

Please specify the amount you would like to allocate to each participant. You may use up to two decimal points when specifying each amount. Please ensure the two values add up to $4 before proceeding.

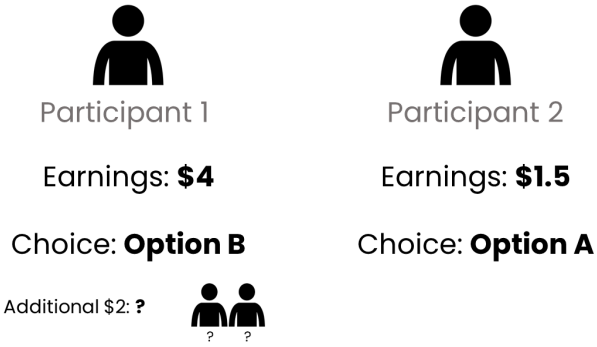
Participant 1 (in $):
Participant 2 (in $):

Confidence: On a scale from 0 to 10, please indicate how confident you are in the decision you just made.

Ex Ante Treatment Decision Example:
Please carefully consider the below scenario. Participant 1 and 2 both faced the following decision:



The outcomes for both participants and the choices they made are given below. Whether the additional $2 generated or not will be revealed after your allocation decision:



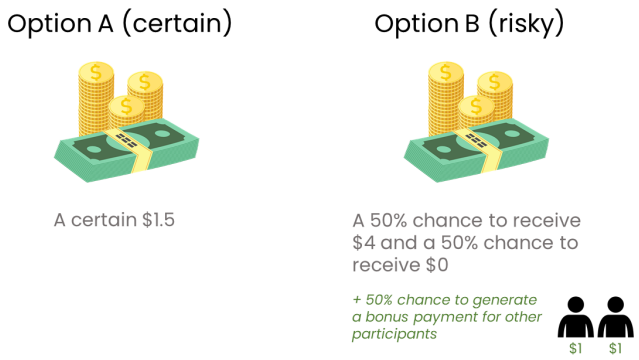
You are now asked to allocate an additional amount of money between the pair. You can allocate this money as you wish. Please note, you have to allocate the total amount of $4.

Please specify the amount you would like to allocate to each participant. You may use up to two decimal points when specifying each amount. Please ensure the two values add up to $4 before proceeding.

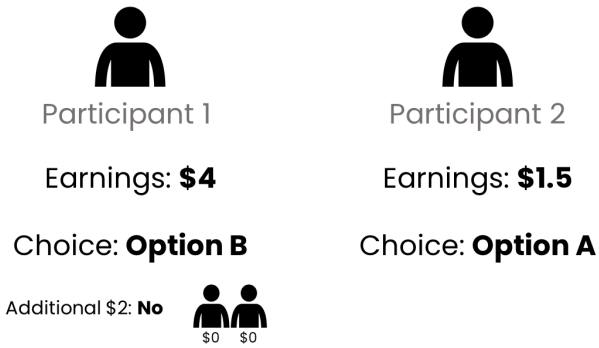
Participant 1 (in $):
Participant 2 (in $):

Confidence: On a scale from 0 to 10, please indicate how confident you are in the decision you just made.

Ex Post Treatment Decision Example:
Please carefully consider the below scenario. Participant 1 and 2 both faced the following decision:



The outcomes for both participants and the choices they made are given below. Because participant 2 chose the risky option B, an additional $2 generated and two randomly chosen participants from other studies **have been given** a $1 bonus payment ($2 in total) / Despite participant 2 having chosen option B, the additional $2 did not generate and the two randomly chosen participants from other studies **have not been given** a $1 bonus payment ($2 in total):



You are now asked to allocate an additional amount of money between the pair. You can allocate this money as you wish. Please note, you have to allocate the total amount of $4.

Please specify the amount you would like to allocate to each participant. You may use up to two decimal points when specifying each amount. Please ensure the two values add up to $4 before proceeding.

Participant 1 (in $):

Participant 2 (in $):

Confidence: On a scale from 0 to 10, please indicate how confident you are in the decision you just made.

Beliefs and Preferences[8]

B1: How did you decide on the allocation of income within the participant pairs?

B2a: Which of the following attributes did you consider when making your allocation decisions? Please select all that apply.

- Inequality in earnings between participants
- The choices participants made
- The outcome of the personal lottery in option B
- Whether the additional $2 generated for the participant pool[9]
- The potential benefit for the participant pool of choosing option B
- Other

B2b: How important were each of the attributes you just selected for your allocation decisions? Please allocate a total of 100 points across the attributes you selected. Please ensure that the more important an attribute was to your decision making, the more points you allocate to it.

B3a: Why do you think some participants chose the risky option B? Please select all that apply.

- To maximise their own payoff
- To maximise the pair's payoff
- To generate the additional $2 for the other participants
- To influence your allocation decision of the additional $4

[8] B1-B4 are asked after each condition. Highlighted options are only displayed in the two treatment conditions. B5-B9 are asked after all three conditions were completed.

[9] This option is only included in the ex ante treatment condition.

- Other

B3b: Which of the reasons you just selected do you think was the main reason why some participants chose the risky option B?

B3conf: On a scale from 0 to 10, please indicate how confident you are that this was the main reason why some participants chose the risky option B.

B4: Why do you think some participants chose the certain option A? Please select all that apply.

- To maximise their own payoff
- To maximise the pair's payoff
- To influence your allocation decision of the additional $4
- Other

B4b: Which of the reasons you just selected do you think was the main reason why some participants chose the certain option A?

B4conf: On a scale from 0 to 10, please indicate how confident you are that this was the main reason why some participants chose the certain option A.

B5: What percentage of decision makers do you believe chose the risky option B in the below scenarios? You will receive a bonus payment of 10ct for each estimate that is within +/-5 percentage points of the correct answer. If all of your estimates are correct, you will therefore be able to earn an additional bonus payment of $1.[10]

I think the percentage of decision makers who chose the risky option B in the scenario where the certain option A was [**x**] and it was **not** possible to generate the additional $2 is:

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

I think the percentage of decision makers who chose the risky option B in the scenario where the certain option A was [**x**] and it **was** possible to generate the additional $2 is:

[10] Each spectator is asked to answer B5 for five randomly selected values of A in the control and treatment condition.

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

B6a: Which of the following do you believe apply? Please choose all options that you agree with. The $2 for the two other randomly chosen participants:

- Will decrease income inequality between all participants on Prolific Academic
- Will increase income inequality between all participants on Prolific Academic
- Will benefit the two participants who receive it
- Will not matter to the two participants who receive it
- Is unfair because they did nothing to receive it
- Will increase the total amount of money all participants on Prolific Academic have combined

B6b: Which of the statements you just selected do you agree with most? The $2 for the two other randomly chosen participants:

B7: On a scale from 0 (lower) to 10 (higher), what do you believe is the effect of the $2 the two randomly chosen participants might receive, if a decision maker chose option B, on income inequality between all participants on Prolific Academic?

B8: Do you believe risk-taking should be rewarded?

- Yes
- No
- I don't know
- I don't have an opinion on this

B9: Do you believe risk-taking for the benefit of society should be rewarded?

- Yes
- No
- I don't know
- I don't have an opinion on this

B.3 Demographics

In this final part of the study, we will ask you a few of questions about yourself. Please read the questions carefully and answer honesty. This part should take only 2-3 minutes.
D1: How old are you?
D2: What is your gender?

- Female
- Male
- Other
- Prefer not to answer

D3: To which of these groups do you consider you belong? You can choose more than one group.

- American Indian or Alaska Native
- Asian
- Black or African-American
- Native Hawaiian or other Pacific Islander
- Spanish, Hispanic or Latino
- White
- Other group
- Prefer not to answer

D4: Which category best describes your highest level of education?

- Primary education or less
- Some high school
- High school degree/GED
- Some college
- 2-year college degree

- 4-year college degree
- Master's degree
- Doctoral degree
- Professional degree (JD, MD, MBA)
- Prefer not to answer

D5: What is your total (annual) household income before tax?

- Under $10,000
- $10,000 - $20,000
- $20,001 - $30,000
- $30,001 - $40,000
- $40,001 - $50,000
- $50,001 - $60,000
- $60,001 - $80,000
- $80,001 - $100,000
- $100,001 - $150,000
- $150,001 - $200,000
- $200,001 - $350,000
- $350,001 - $500,000
- Above $500,000
- Don't know
- Prefer not to answer

D6: What is your current employment status?

- Full-time employee
- Part-time employee

- Self-employed or small business owner
- Medium or large business owner
- Unemployed and looking for work
- Student
- Not currently working and not looking for work (e.g. full-time parent)
- Retiree
- Prefer not to answer

D7: Have you ever taken a module on economics or a related subject area at university?

- Yes
- No
- I have never attended higher education

D8: In politics people sometimes talk of left and right. Where would you place yourself on the following scale?

D9: Which party do you feel closest to?

- Democratic Party
- Republican Party
- Other
- Don't know

D10: Who did you vote for in the recent 2020 Presidential Election?

- Joe Biden
- Donald Trump
- Other candidate
- Didn't vote
- Don't remember

- Prefer not to say

D11: Please tell us, in general, how willing or unwilling you are to take risks. Please use a scale from 0 to 10, where 0 means "completely unwilling to take risks" and a 10 means you are "very willing to take risks". You can also use any numbers between 0 and 10 to indicate where you fall on the scale.

D12: Please respond to the following statements by indicating the extent to which you agree or disagree with them on a scale from 1 (I strongly agree) to 7 (I strongly disagree).

- There is a right way and a wrong way to do almost everything
- Practically every problem has a solution
- I feel relieved when an ambiguous situation suddenly becomes clear
- I find it hard to make a choice when the outcome is uncertain

D13: Do you have any feedback or impressions regarding this study?