

1 Experiment Instructions

Timing	Description
t=1	<u>Instructions</u> • Consent form and general Instructions about the experiment - figure 1, 2 • Instructions on the risk elicitation task - figure 3, 4 • Instructions on the lottery choice task - figure 5 • Instructions on the Willingness-to-pay (WTP) elicitation mechanism - figure 6, 7
	<u>Start of the main experiment</u> - figure 8
t=2	<u>Risk preference elicitation task</u> - figure 9
t=3	<u>10 rounds of choice task</u> - figure 11 Choice task with either platform or expected utility algorithm (in case of platform algorithm, expected utility algorithm in the next set of 10 choice tasks and vice-versa; order randomized).
t=4	<u>Buffer Screen</u> informing subjects of a change in the algorithm - figure 12
t=5	<u>10 rounds of choice task</u> - figure 13
t=6	<u>Willingness to pay elicitation</u> - figure 14, 15 • Subjects receive an endowment of 1\$ • Subjects can choose the probabilities $(x, 1 - x)$ that they face the expected utility algorithm or the platform algorithm respectively for the next set of 10 choice tasks. • The cost of changing the probability is equal to $p = \\$(x - 0.5) \times 2$
t=7	<u>10 rounds of choice task</u> With either expected utility or platform algorithm based on a random draw with the probabilities $(x, 1-x)$.
t = 8	Survey - figure 16, 17
t = 9	Disclosure of the realization of the bonus payment, end of the experiment - figure 18

Table 1: Timing of the experiment

Consent Form

Welcome to the ARS experiment.

We are inviting you to participate in an online economics experiment about individual decision-making. This study is being led by Felix Schleef, Department of Economics, ENSAE-CREST-IP Paris, and has been approved by the Institutional Review Board of the Institut Louis Bachelier (<https://www.institutlouisbachelier.org/en/louis-bachelier-institutional-review-board-2/>).

To successfully participate in the experiment, you must complete the experimental session during which you will be asked to make decisions. The experiment will start on the next page. To complete the session, you must answer all questions and perform all mandatory tasks. We expect today's session to last approximately 20 minutes.

The experiment is taking place on this website (https://ars-experiment-9e8858efe794.herokuapp.com/room/ars_prolific). If you complete the full experimental session you will receive a completion fee of 4\$, as well as a bonus reward that will depend on your decisions during the experiment (and potentially on luck). The total reward including this bonus will be approximately equal to 10\$ on average, and can be as high as 15\$. The payout will be made to you in the next two to three days via the Prolific system. If you get screened out before the end of the experiment, you will receive a participation fee of 1\$.

You are free to refuse to participate in this experiment, or to remove your consent and drop out of the experiment at any point in time. However, if you do not complete the experiment, you will not receive any payout. Therefore, please start this experiment only if you can commit to finishing the session.

The data collected during the experiment will be stored in a database. No identifying information will be collected apart from your Prolific ID, which we need to reward you with the bonus payout. Your Prolific ID will be irrevocably deleted from the database as soon as the data collection is over. The resulting anonymized data set (that is, without your Prolific ID or any other identifying information) might be made public in the future if a scientific article based on it is published.

We anticipate that your participation in this experiment presents no greater risk than everyday use of the Internet.

If you have questions about this study, you may contact the lead researcher at felix.schleef@ensae.fr. If you have any questions, concerns, or complaints regarding your rights as a subject in this experiment, you can contact the Institutional Review Board (IRB) at irb@institutlouisbachelier.org.

By checking the box below, you confirm that you have read and understood the above instructions, and that you consent in participating in the experiment.

I understand the instructions and consent in participating in the experiment:

☐

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Figure 1: Screenshot - Consent Form

Tutorial - Introduction

Welcome to the experiment! Before we dive into the main tasks, we'll guide you through a brief tutorial. This is a crucial step to familiarize yourself with the choice mechanisms you'll encounter and understand how these choices can influence your bonus rewards.

In the next few screens, you'll encounter simplified scenarios resembling the decisions you'll make during the experiment.

Please note: The choices you make in this tutorial section will not affect your bonus payout. They are designed solely to help you understand the different mechanisms at play.

Let's ensure you feel comfortable with the process and fully prepared to maximize your bonus potential. Ready to begin?

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Figure 2: Screenshot - Tutorial Introduction

Tutorial - Lottery vs Safe Option

This is an example of one of the choices that you will be asked to make in the experiment. The choice you make on this screen is not relevant for your bonus payoff, because it is part of the tutorial.

In this part of the experiment, you receive either a **lottery** or a fixed amount of money **X\$**.

The **lottery** pays 10\$ with 50% probability and 0\$ with 50% probability.

The value of **X\$** is a random number between 0\$ and 10\$ that was selected before the start of the experiment.

Please give us instructions by setting a **threshold** such that:

- "If the money amount **X\$** is equal to or above the **threshold**, then give me **X\$**."
- "If the money amount **X\$** is below the **threshold** then give me the **lottery**."

Lottery	10\$ with 50% probability, 0\$ with 50% probability
Fixed Amount	X\$ with 100% probability

On this page, you are asked to set a threshold so that your preferred choice gets implemented. Consider different values that X could take. If X was 6\$, would you prefer receiving X, or would you prefer receiving the lottery? If you would prefer having 6\$, you should set your threshold below 6\$. Similarly, consider if X was 2\$ - if you would prefer to receive the lottery, you should set your threshold above 2\$. Click on the blue bar below to reveal the slider, and drag it around to select your threshold.

Click the blue bar to reveal the slider and set your threshold value.



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Figure 3: Screenshot - Tutorial - Risk Preference Elicitation

Tutorial - Lottery vs. Safe Option - Results

This is how the result for this choice task could look like:

The value X was 8.9\$. Your selected threshold was 3.5\$. X is above your threshold, therefore your bonus payoff from this part would have been 8.9\$.

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Figure 4: Screenshot - Tutorial - Risk Preference Elicitation Result

Tutorial - Lottery Choice Number

On this page, you have the choice between different lotteries. Clicking "Choose" will select this lottery and take you to the next screen.
Consider the first lottery: you will receive 10\$ with a probability of 50%; 5\$ with a probability of 30% and 0\$ with a probability of 20%. These probabilities mean that if 10 people play, on average 7 will receive 10\$, 3 will receive 5\$ and 2 will receive 0\$.
The choice you make on this screen is not relevant for your bonus payoff, because it is part of the tutorial.

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	50%	30%	20%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	48%	20%	32%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	72%	10%	18%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
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Figure 5: Screenshot - Tutorial - List Choice

Tutorial - Slider Choice

On this page, you can influence the probability that either event A or event B happens. To influence the probability, please click on the slider. It is costly to influence the probability. For this task, you have an endowment of 1\$ that you can spend on influencing the probability. Any unspent endowment could go towards your bonus payoff in the real experiment. Please see below the slider for the current probabilities and the price. The choice you make on this screen is not relevant for your bonus payoff, because it is part of the tutorial.

You can now use an endowment of **1\$** to change the probability that event A or event B happens.

Event A

Event B

Click the blue bar to reveal the slider.



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Figure 6: Screenshot - Tutorial - Slider Choice

Tutorial - Slider Choice Results

This is how the result for this choice task could look like:

You have selected the following probabilities:

Event A: **54%**

Event B: **46%**

The event that has been randomly selected based on these probabilities is: **event A**

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Figure 7: Screenshot - Tutorial - Slider Choice Result

Introduction

This experiment consists of four parts. In the three first parts, you will be asked to make different choices.

All choices that you make in the first three parts are relevant for your bonus payoff.

The last part is a survey, which is not relevant for your payoff.

You will only be paid if you complete the full experiment. For this reason, please only start the experiment if you have at least 20 minutes to complete it.

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Figure 8: Screenshot - Experiment Introduction

Part 1 - Lottery vs Safe Option

In this part of the experiment, you receive either a **lottery** or a fixed amount of money **X\$**.

The **lottery** pays 10\$ with 50% probability and 0\$ with 50% probability.

The value of **X\$** is a random number between 0\$ and 10\$ that was selected before the start of the experiment.

Please give us instructions by setting a **threshold** such that:

- "If the money amount **X\$** is equal to or above the **threshold**, then give me **X\$**."
- "If the money amount **X\$** is below the **threshold** then give me the **lottery**."

Lottery	10\$ with 50% probability, 0\$ with 50% probability
Fixed Amount	X\$ with 100% probability

Click the blue bar to reveal the slider and set your threshold value.



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Figure 9: Screenshot - Risk preference elicitation stage

2. Instructions - Choosing from lists of lotteries

In the second part of the experiment, you will take 20 decisions. For each decision, you will be shown a list of 10 lotteries from which you are asked to select the one you like the most.

Algorithms

The 10 lotteries on each page are **selected and ordered by algorithms**. There will be **two different** algorithms during this experiment. These algorithms may select and order lotteries in different ways that are important for the way you make choices. **Please pay close attention to the algorithms and the way they select and order lotteries. At some point you will be asked to compare the algorithms.**

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Figure 10: Screenshot - Introduction choice experiment

Part 2 - Lottery Choice Number 1

The list of lotteries is generated by **Algorithm 1**

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	4%	94%	2%	<button>Choose</button>

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	8%	81%	11%	<button>Choose</button>

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	17%	74%	9%	<button>Choose</button>

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	13%	73%	14%	<button>Choose</button>

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	13%	72%	15%	<button>Choose</button>

Figure 11: Screenshot - Choice screen where lotteries are selected and ordered by algorithm 1 (Platform algorithm)

Algorithm Change

You have now made 10 choices where the lotteries were **selected and ordered** by **Algorithm 1** .

For the **next 10 choices** , the lotteries will be selected and ordered by **Algorithm 2** . Please pay attention to the fact that this algorithm may differ in ways that are important for your choice.

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Figure 12: Screenshot - Buffer Screen between rounds 10 and 11

Part 2 - Lottery Choice Number 11

The list of lotteries is generated by [Algorithm 2](#)

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	7%	92%	1%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	21%	68%	11%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	35%	44%	21%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	1%	99%	0%	Choose

Payoffs	A = 10\$	B = 5\$	C = 0\$	
Probabilities	46%	26%	28%	Choose

Figure 13: Screenshot - Choice screen where lotteries are selected and ordered by algorithm 2 (Expected utility algorithm)

Part 3 - Algorithm Choice

In the third part of the experiment, you will face 10 more rounds of choices from lotteries.

Before these rounds start, you have an endowment of **1\$**. You can use this money to change the probability which algorithm will select and order the lotteries in the next 10 choice rounds.

The part of the endowment that you do not spend in order to change the probabilities will be added to your bonus payment if the third part of the experiment is selected for the bonus.

In the next 10 choice rounds, you will see the same kind of lotteries as before, with the outcomes 10\$, 5\$ and 0\$.

Please use the slider below to select the probabilities.

Algorithm 1	Algorithm 2
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Click the blue bar to reveal the slider.



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Figure 14: Screenshot - Choice between algorithms

Part 3 - Algorithm Choice

In the third part of the experiment, you will face 10 more rounds of choices from lotteries.

Before these rounds start, you have an endowment of **1\$**. You can use this money to change the probability which algorithm will select and order the lotteries in the next 10 choice rounds.

The part of the endowment that you do not spend in order to change the probabilities will be added to your bonus payment if the third part of the experiment is selected for the bonus.

In the next 10 choice rounds, you will see the same kind of lotteries as before, with the outcomes 10\$, 5\$ and 0\$.

Please use the slider below to select the probabilities.

Algorithm 1

Algorithm 2

Click the blue bar to reveal the slider.

The probability of algorithm 1 is: **18%**
The probability of algorithm 2 is: **82%**
You pay: **0.64\$**

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Figure 15: Screenshot - Choice of probability of algorithm 1 or algorithm 2 for the last 10 choice rounds

4. Survey

Thank you for participating in our research study. This survey is designed to gather your insights and feedback on the algorithms you've interacted with during the experiment. Your responses are invaluable in helping us understand the impact and effectiveness of these algorithms from a user perspective. The survey consists of a series of questions about your experience, preferences, and any observations you made during the experiment. Please answer as honestly and thoroughly as possible. Thank you for your time and valuable contributions to our research.

Which algorithm created the lists for rounds 1-10 of the experiment?

Algorithm 1	Algorithm 2
☐	☐

Which algorithm created the lists for rounds 11-20 of the experiment?

Algorithm 1	Algorithm 2
☐	☐

Which algorithm created the lists for rounds 21-30 of the experiment?

Algorithm 1	Algorithm 2
☐	☐

How helpful did you find algorithm 1?

Not helpful at all	Slightly helpful	Moderately helpful	Helpful	Very helpful
☐	☐	☐	☐	☐

How helpful did you find algorithm 2?

Not helpful at all	Slightly helpful	Moderately helpful	Helpful	Very helpful
☐	☐	☐	☐	☐

How confident are you that you understand how algorithm 1 orders lotteries?

Not confident at all	Somewhat confident	Moderately confident	Confident	Completely confident
☐	☐	☐	☐	☐

How confident are you that you understand how algorithm 2 orders lotteries?

Not confident at all	Somewhat confident	Moderately confident	Confident	Completely confident
☐	☐	☐	☐	☐

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Figure 16: Screenshot - Survey

Survey

What did you like/dislike about algorithm 1's way of ordering the list?

What did you like/dislike about algorithm 2's way of ordering the list?

What did you have in mind when you were asked to choose between algorithm 1 and algorithm 2?

Please share any additional comments or suggestions you may have about the algorithms or the experiment in general.

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Figure 17: Screenshot - Survey open questions

End of the Experiment

Payoff Procedure

This experiment consisted of three parts. For your bonus pay, one of these parts gets randomly selected. Please see below for a description of the procedure that is used to calculate your payoff in each case.

- **Part 1: Choosing between a lottery and a safe option**

In this part, you were asked to declare a threshold above which you would want to switch from receiving a lottery to receiving a fixed payment. To calculate your payment, a value between 0 and 10 is drawn randomly. If the threshold you selected is below the randomly drawn value, you receive the randomly drawn value. Otherwise, the lottery that pays 10\$ with probability 50% and 0\$ with probability 50% is drawn and the outcome is added to your payoff.

- **Part 2: Choosing from lists of lotteries - round 1-20**

In this part, you were asked to make choices from lists of lotteries, in rounds 1-10 the lotteries were selected and ordered by algorithm 1, in rounds 11-20 the lotteries were selected and ordered by algorithm 2. To calculate your payoff, one round is randomly selected. The outcome of the lottery is drawn and added to your payoff.

- **Part 3: Choosing between algorithms and choosing from lists of lotteries - round 21-30**

In this part, you were given the opportunity to change the probability with which either algorithm 1 or algorithm 2 would create the lists of lotteries for the rounds 21-30. To calculate your payoff, one round is randomly selected. The outcome of the lottery is drawn and added to your payoff. In addition, you receive the endowment that you did not spend on changing the probability of the lottery.

Your Payoff

The part that determines your bonus payment is part 2.

The randomly selected round is round number 18. You chose the lottery [$P(10) = 49\%$, $P(5) = 28\%$, $P(0) = 23\%$] in this round.

The outcome of the lottery was drawn to be 10\$. **Your bonus payoff from the experiment is therefore \$10.00.**

By clicking on the "Finish Experiment" button below, you return to the Prolific website to receive your payment.

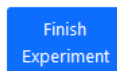


Figure 18: Screenshot - End of the experiment and payment screen

Part 2

This is a test to see whether you pay attention. Please pick the third option from the list below.

Payoffs	A = 0\$	B = 0\$	C = 0\$	
Probabilities	26%	69%	5%	<button>Choose</button>

Payoffs	A = 0\$	B = 0\$	C = 0\$	
Probabilities	19%	76%	5%	<button>Choose</button>

Payoffs	A = 0\$	B = 0\$	C = 0\$	
Probabilities	42%	35%	23%	<button>Choose</button>

Payoffs	A = 0\$	B = 0\$	C = 0\$	
Probabilities	16%	73%	11%	<button>Choose</button>

Payoffs	A = 0\$	B = 0\$	C = 0\$	
Probabilities	32%	44%	24%	<button>Choose</button>

Figure 19: Screenshot - Attention check

End of the Experiment

Thank you for taking part in the experiment.

By clicking on the "Finish Experiment" button below, you return to the Prolific website to receive your payment.

[Finish
Experiment](#)

Figure 20: Screenshot - Attention check fail