

Time Preferences And Risk Aversion: Tests On Domain Differences

Appendix for Online Publication

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Christos A. Ioannou

University of Southampton

C.Ioannou@soton.ac.uk

Jana Sadeh

University of Southampton

J.Sadeh@soton.ac.uk

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1 Experimental Instructions

1.1 Set A1

The specific set of experimental instructions (referred to as A1 in the manuscript) consists of the instructions given to subsample A1. Subsample A1 was presented with the following tasks in this order: Monetary Discounting, Monetary Risk Aversion Test, Environmental Discounting, Environmental Risk Aversion Test, Cognitive Reflection Test and the Questionnaire. The experimental instructions for subsamples A2, B1 and B2 are analogous to those for subsample A1. The only difference is the order in which the first four tasks were presented. The titles of the stages were omitted from the experimental instructions given to subjects.

The purpose of this experimental session is to study how people make decisions in a particular situation.

The experimental session consists of **six** stages to be described at the appropriate time.

The instructions are the same for all participants.

For your participation in the experimental session, you will receive £5 as a participation fee. In addition, you will have the opportunity to increase your earnings.

At the end of the session, when all the participants have completed all six stages, you will be paid your total earnings. Your total earnings will be placed in a payment envelope. The instructions are simple, yet if you have a question please raise your hand. Aside from these questions, any communication with other participants or looking at other participants' screens is not permitted and will lead to your immediate exclusion from the experiment.

All information collected during the experiment will be kept **strictly confidential** and data will be handled in line with the Data Protection Act 1998.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

1.1.1 Monetary Discounting (MD)

Stage 1

Your responses in this Stage might be selected for payment.

This Stage consists of three blocks of 6 questions in each block for a total of 18 questions. The questions will require you to make a choice between a smaller monetary outcome occurring at one point in time and another larger monetary outcome occurring at a later point in time. The time delay is identical **within** each block but will change **between** blocks.

Example

Please select which of the following you prefer:

£50 payable in 1 month from today.

£55 payable in 7 months from today.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

[The following choices were displayed one by one on the subjects' screens.]

Table 1: BINARY CHOICES PRESENTED IN MD

Binary Choice	
Smaller Sooner	Larger Later
£50	£55
£50	£60
£50	£65
£50	£70
£50	£75
£50	£100

Notes: In the first column, we present the smaller sooner amount, which is the amount that would be available to subjects after the one month front-end delay, while in the second column, we present the larger later amount, which is the amount that would be available to subjects after the specified delay period. Subjects answered three sets of these six questions, one for each of the time-delay periods: (i) the 3-month delay period, (ii) the 6-month delay period, and (iii) the 12-month delay period.

As indicated earlier, your responses in this Stage might be selected for payment at the end of the experimental session. Here is how.

A participant in the lab today will be selected at the end of the experimental session using the bingo machine on the side. Each participant has an equal chance of being selected.

The selected participant will face another two draws. The first draw will determine the Stage (either Stage 1 or Stage 3), and the second will identify one specific question from the selected Stage. All the draws will be carried out using the bingo machine.

Recall that you will respond to a total of 18 questions in this Stage (3 blocks of six questions in each block), and will answer another 18 questions in Stage 3. Based on the selected participant's response in the specific question drawn, the selected participant will get paid.

For example, assume you are the selected participant, this Stage was drawn, and in the specific question drawn you had responded that you would rather have £X in Y months. Then, the experimenter will put a completed **Requisition Form** for £X with the payment date in Y months' time in your payment envelope.

Note: A **Requisition Form** is an official request for payment that can be submitted to the University of Southampton. Requisition Forms will be paid on the date specified in the question (in this example in Y months' time) provided you fill in the necessary details on the form.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

1.1.2 Monetary Risk Aversion Test (MRAT)

Stage 2

Your response in this Stage might be selected for payment.

In this part of the study, you are asked to choose one of the five options shown below. Regardless of which option you choose, there are two possible outcomes (Outcome X and Outcome Y). These outcomes are equally likely in all five options – there is a 50% chance of Outcome X and a 50% chance of Outcome Y, just like the flip of a coin. The options differ only in how much each outcome pays.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

[The following options were displayed to subjects in the same format as shown below.]

Table 2: OPTIONS PRESENTED IN MRAT

Option	Outcome	Payoffs (£)	Probability
1	X	50.00	50%
	Y	50.00	50%
2	X	35.00	50%
	Y	87.50	50%
3	X	25.00	50%
	Y	112.50	50%
4	X	15.00	50%
	Y	137.50	50%
5	X	5.00	50%
	Y	162.50	50%

Notes: In the first column, we list the 5 options available to subjects. In the second column, we list the possible outcomes of each option: Outcome X or Outcome Y. In the third column, we list the payoffs associated with each outcome in each option, and in column four, we list the probability of that specific outcome occurring given the subject picked that option.

As indicated earlier, your response in this Stage might be selected for payment at the end of the experimental session. Here is how.

A participant in the lab today will be selected at the end of the experimental session using the bingo machine on the side. Each participant has an equal chance of being selected.

The selected participant will face another two draws. The first draw will determine the Stage (either Stage 2 or Stage 4), and the second will identify the outcome (either Outcome X or Outcome Y). All the draws will be carried out using the bingo machine.

You will choose one option in this Stage and one option in Stage 4. The selected participant will be paid based on the stage drawn, the outcome drawn, and the selected participant's option choice.

For example, assume you are the selected participant, this Stage is drawn, and you chose Option 2; then, you will either earn £35 if Outcome X occurs or £87.50 if Outcome Y occurs. If you chose Option 4, then, you will either earn £15 if Outcome X occurs or £137.50 if Outcome Y occurs. The experimenter will put a completed Requisition Form for your earnings with today's date as the payment date in your payment envelope.

You will only find out the outcome at the end of the experimental session. The options will be displayed again when you begin the Stage.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

1.1.3 Environmental Discounting (ED)

Stage 3

Your responses in this Stage might be selected for payment.

An Environmental Project is going to be carried out at the University of Southampton between April 2014 and April 2015. The project has been sponsored by various grants.

On four separate occasions, volunteers will be distributing free, bee-friendly plants to staff and students at the University's Highfield campus.

The plants will be chosen depending on the time of year they are to be planted, in order to ensure that they are immediately beneficial to bees, and that they require little care outside of the original planting.

Bees are behind much of the food we eat as they pollinate the plants that produce most of our fruit and vegetables. Bees, however, face numerous threats and their numbers are declining due to changes in land use, building projects, pesticides, pollution and climate change.

Small changes, such as planting nectar-rich flowers, can help restore bee populations. Bee-friendly plants can attract up to 100 times as many bees. Feeding havens in the middle of an urban jungle have great value. The project will help create bee-friendly communities.

In this stage, the choices you make will increase the number of plants distributed in this project.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

This Stage also consists of three blocks of 6 questions in each block for a total of 18 questions. The questions will require you to make a choice between a smaller environmental outcome occurring at one point in time and another larger environmental outcome occurring at a later point in time. The time delay is identical **within** each block but will change **between** blocks.

Example

Please select which of the following you prefer:

10 plants that will be distributed in 1 month from today.

11 plants that will be distributed in 7 months from today.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

[The following choices were displayed one by one on the subjects' screens.]

Table 3: BINARY CHOICES PRESENTED IN ED

Binary Choice	
Smaller Sooner	Larger Later
10 plants	11 plants
10 plants	12 plants
10 plants	13 plants
10 plants	14 plants
10 plants	15 plants
10 plants	20 plants

Notes: In the first column, we present the smaller sooner amount, which is the amount that would be available to subjects after the one month front-end delay, while in the second column, we present the larger later amount, which is the amount that would be available to subjects after the specified delay period. Subjects answered three sets of these six questions, one for each of the time-delay periods: (i) the 3-month delay period, (ii) the 6-month delay period, and (iii) the 12-month delay period.

As indicated earlier, your responses in this Stage might be selected for payment at the end of the experimental session. Here is how.

As was explained in Stage 1, a participant in the lab today will be selected at the end of the experimental session using the bingo machine on the side. Each participant has an equal chance of being selected.

The selected participant will face another two draws. The first draw will determine the Stage (either Stage 1 or Stage 3), and the second will identify one specific question from the selected Stage. All the draws will be carried out using the bingo machine.

Recall that you will respond to a total of 18 questions in this Stage (3 blocks of six questions in each block), and have already answered another 18 questions in Stage 1. Based on the selected participant's response in the specific question drawn, the selected participant will get paid.

For example, assume you are the selected participant, this Stage was drawn, and in the specific question drawn you had responded that you would rather have X plants in Y months. Then, the experimenter will add X plants to the environmental project and they will be distributed on campus in Y months' time. You will be informed in advance about the exact project date and you may choose to receive an email update about the event.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

1.1.4 Environmental Risk Aversion Test (ERAT)

Stage 4

Your response in this Stage might be selected for payment.

In this part of the study, you are asked to choose one of the five options shown below. Regardless of which option you choose, there are two possible outcomes (Outcome X and Outcome Y). These outcomes are equally likely in all five options – there is a 50% chance of Outcome X and a 50% chance of Outcome Y, just like the flip of a coin. The options differ only in how much each outcome pays.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

[The following options were displayed to subjects in the same format as shown below.]

Table 4: OPTIONS PRESENTED IN ERAT

Option	Outcome	Payoffs (plants)	Probability
1	X	10 plants	50%
	Y	10 plants	50%
2	X	7 plants	50%
	Y	18 plants	50%
3	X	5 plants	50%
	Y	23 plants	50%
4	X	3 plants	50%
	Y	28 plants	50%
5	X	1 plant	50%
	Y	33 plants	50%

Notes: In the first column, we list the 5 options available to subjects. In the second column, we list the possible outcomes of each option: Outcome X or Outcome Y. In the third column, we list the payoffs (in plants) associated with each outcome in each option, and in column four, we list the probability of that specific outcome occurring given the subject picked that option.

As indicated earlier, your response in this Stage might be selected for payment at the end of the experimental session. Here is how.

As was explained in Stage 2, a participant in the session today will be selected at the end of the experimental session using the bingo machine on the side. Each participant has an equal chance of being selected.

The selected participant will face another two draws. The first draw will determine the Stage (either Stage 2 or Stage 4), and the second will identify the outcome (either Outcome X or Outcome Y). All the draws will be carried out using the bingo machine.

You will choose one option in this Stage, and have already chosen one option in Stage 2. The selected participant will be paid based on the stage drawn, the outcome drawn, and the selected participant's option choice.

For example, assume you are the selected participant, this Stage is drawn, and you choose Option 2; then, you will either get 7 plants if Outcome X occurs or 18 plants if Outcome Y occurs. If you choose Option 4, then, you will either get 3 plants if Outcome X occurs or 28 plants if Outcome Y occurs. These plants will be added to the environmental project.

You will only find out the outcome at the end of the experimental session. The options will be displayed again when you begin the Stage.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

1.1.5 Cognitive Reflection Test (CRT)

Stage 5

Your responses in this Stage will not be paid.

In this part of the study you are asked to respond to three questions. Please choose your option by clicking on a radio button. You will be asked to confirm your choice before you move to the next screen.

If you would like further clarification, please raise your hand and the experimenter will come by shortly to answer your questions; otherwise, please click the Next button.

- A bat and a ball cost £1.10 in total. The bat costs £1.00 more than the ball. How much does the ball cost?
 - A. £0.10
 - B. £0.05
 - C. £0.02
 - D. £0.08

- If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?
 - A. 5 minutes
 - B. 6 minutes
 - C. 100 minutes
 - D. 10 minutes

- In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?
 - A. 37 days
 - B. 24 days
 - C. 42 days
 - D. 47 days

1.1.6 Questionnaire (Q)

Stage 6

Your responses in this Stage will not be paid.

In this part of the study you will complete a questionnaire. The questionnaire asks you to answer some questions about yourself and some questions of an environmental nature. You will always have the option to not answer a question if you don't wish to provide some information. Failure to provide information will NOT affect your ability to participate in the remainder of the experiment.

Please choose your option by clicking on a radio button.

If you would like further clarification, please raise your hand and an experimental assistant will come by shortly to answer your questions; otherwise, please click the Next button.

1. What is your age?

2. What is your gender?

Male

Female

Prefer not to answer

3. On average, in a typical month, how much do you spend on non-accommodation expenses? (Please count the total expenditure on food, entertainment, clothes, mobile phone bills, and transport, but exclude rent/mortgage repayment)

4. Do your parents own or rent the house in which they now live?

Own

Rent

Prefer not to answer

5. I would only travel by bus if I had no other choice.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

6. For the sake of the environment, car users should pay higher taxes.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

7. People who fly should bear the cost of the environmental damage that air travel causes.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

8. I don't pay much attention to the amount of water I use at home.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

9. People have a duty to recycle.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

10. We are close to the limit of the number of people the earth can support.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

11, The earth has very limited room and resources.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

12. If things continue on their current course, we will soon experience a major environmental disaster.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

13. The so-called 'environmental crisis' facing humanity has been greatly exaggerated.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

14. It would embarrass me if my friends thought my lifestyle was purposefully environmentally friendly.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

15. Being green is an alternative lifestyle, it's not for the majority.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

16. I find it hard to change my habits to be more environmentally friendly.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

17. It's only worth doing environmentally-friendly things if they save you money.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

18. The effects of climate change are too far in the future to really worry me.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

19. It's not worth me doing things to help the environment if others don't do the same.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

20. It's not worth Britain trying to combat climate change, because other countries will just cancel what we do.

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Don't know

21. Which of these best describes how you feel about your current lifestyle and the environment?

- I'd like to do a lot more to help the environment
- I'd like to do a bit more to help the environment
- I'm happy with what I do at the moment
- Don't know