

Bargaining about Time: Evidence from Dictator and Ultimatum Games

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- Experimental work: LMU Munich (Chair Braun), Anja Hellmann.

Structure

1. Initial Problem
2. Theory
3. Hypotheses
4. Design
5. Results
6. Summary and Conclusions

1. Initial Problem: Ultimatum Game

- Two players must come to an agreement on how to share an amount of a good (one-shot).
 - Player A (the proposer) makes an offer how to divide it.
 - Player B (the responder) then chooses if he accepts the offer or not.
 - If he accepts, the money is divided accordingly.
 - If he does not accept, both players get nothing.
- Empirical evidence: subjects don't behave as it is predicted by standard game theory:
- Proposers offer more than the lowest possible monetary unit (mean 40%).
 - Responders reject small proposals (50% of all proposals of $< 20\%$).

1. Initial Problem: Dictator Game

Equal proposals can be caused by fairness, or by fear of rejections. This can be tested with the dictator game. Here, player B (the receiver) has no possibility to reject player A's (the dictator's) offer (one-shot).

→ Dictators still don't behave according to standard game theoretical predictions:

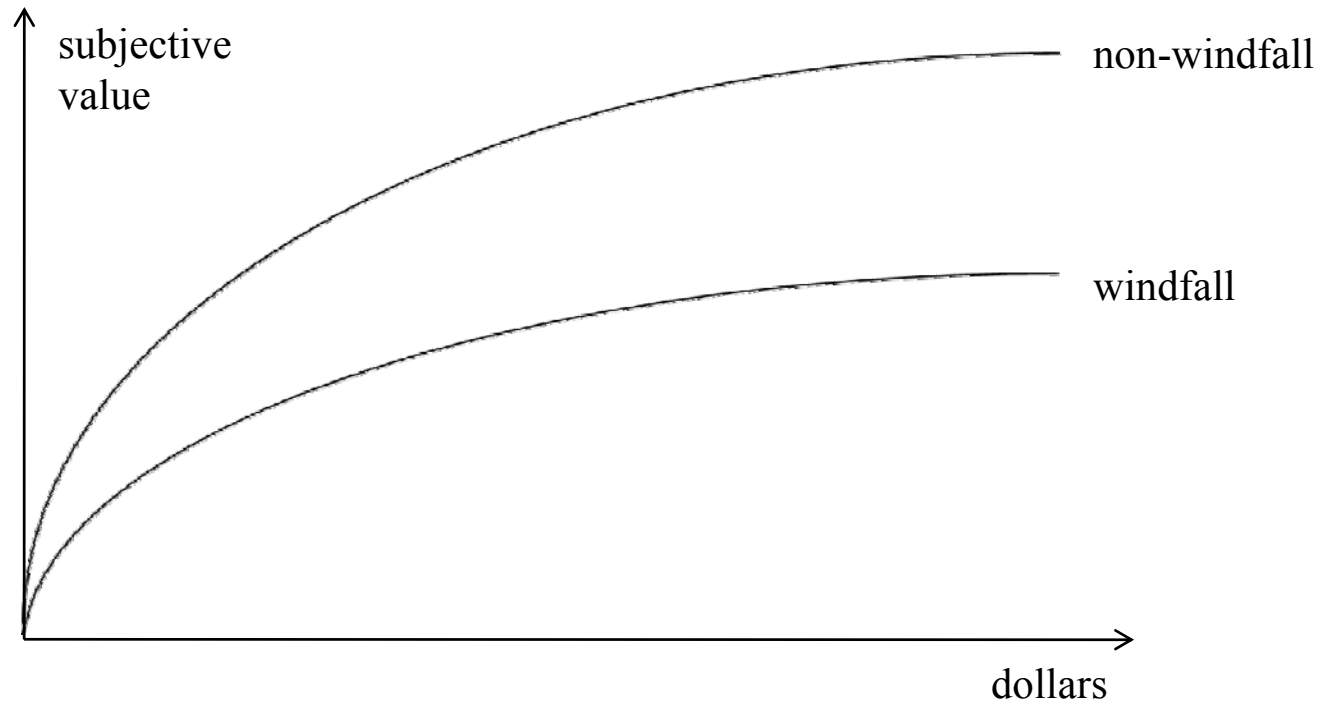
On average, dictators offer 20 %.

→ Proposers' fair behavior can only be partly explained by the fear of rejection.

2. Theory: Alternative Explanations

- Windfall gains
- Low cost hypothesis
- Losses vs. gains
- Anonymity

2. Theory: Windfall gains



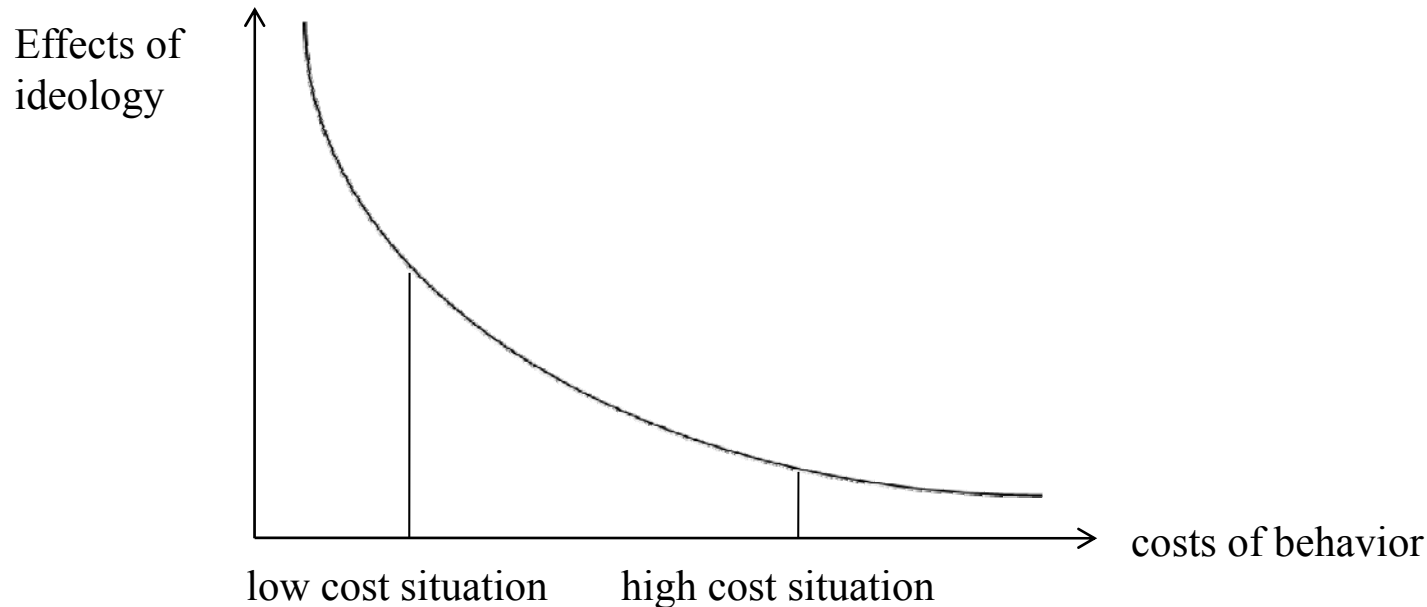
Windfall gains are valued smaller than non-windfall gains,
thus, they are spent more readily.

(vgl. Arkes et al. 1994)

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2. Theory: Low Cost Hypothesis



Decisions are influenced

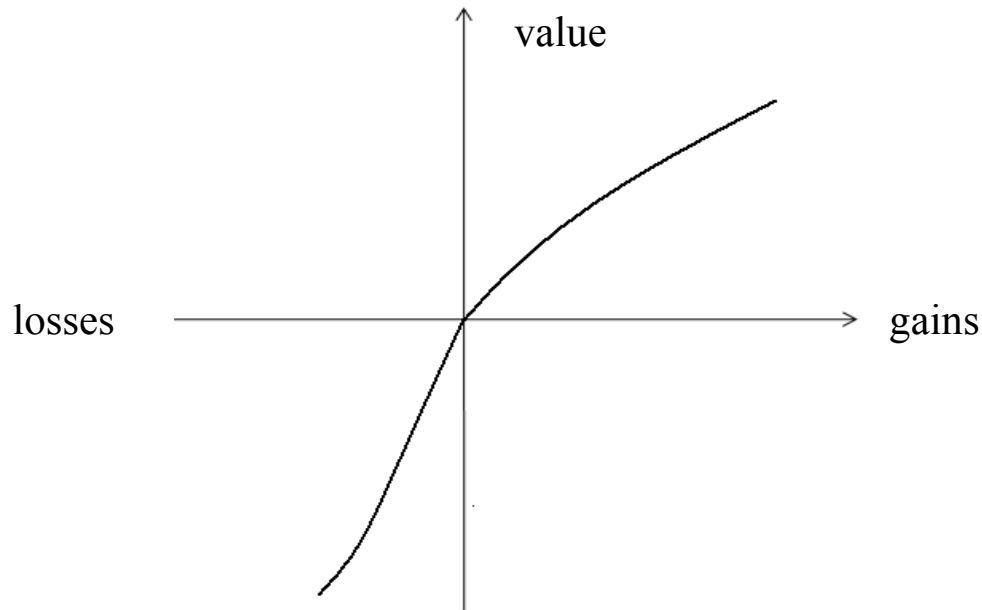
- by moral norms in low cost situations.
- by economic incentives in high cost situations.

(vgl. Diekmann & Preisendörfer 1992)

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2. Theory: Prospect Theory



1. Losses are valued higher than gains.
2. People are risk averse in the domain of gains and risk seeking in the domain of losses.

(vgl. Kahneman & Tversky 1979)

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2. Theory: Anonymity

- Perfect stranger anonymity
- Doubleblind anonymity

Doubleblindness further reduces social desirable actions.

(vgl. Cherry et al. 2002)

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2. Theory: Only Losses at Stake

To avoid the problem of windfall gains, we conducted an experiment, in which the decisions of the players were directly connected with costs.

→ The subjects bargained about the division of
60 minutes waiting time
(with same payment for all subjects).

3. Hypotheses

- Behavior should be close to the predictions of standard game theory.
- H1: In dictator and ultimatum games with bargaining about time, decisions will be close to the subgame perfect Nash equilibrium.
- H2: The more anonymity (toward experimenters and/or subjects) is guaranteed, the closer the decisions will be to the subgame perfect Nash equilibrium.
- H3: In dictator games, subjects are less cooperative than in ultimatum games.

4. Design: Location/Time/Subjects

- Location: Rooms 108/308 and 109/309 in the institute for sociology, LMU Munich.
- Time: Semester break between winter 2008/09 and summer 2009.
- Subjects: 143 persons from the subjects pool of the Institute for Sociology of the LMU Munich (Mean age 23.8 years (sd. 3.38), 40.85 % male, 59.15 % female).

4. Design: Invitation

- The subjects were invited to the experiment via e-mail.
- Each session consisted of 16 subjects.
- The sex of the subjects was held constant in each session.
- All subjects were students. Students of economics in higher semesters were not invited.
- Payment: 15 €

4. Design: Treatments

Experimental design with six treatments:

		Possibility for Punishment	
		No	Yes
Anonymity	Baseline	Dictator game without anonymity	Ultimatum game without anonymity
	Anonymous I	Dictator game with anonymity between the subjects	Ultimatum game with anonymity between the subjects
	Anonymous II	Dictator game with doubleblind anonymity (subjects and experimenter)	Ultimatum game with doubleblind anonymity (subjects and experimenter)

4. Design: Experimental Setup

- There were alarm clocks and black pens at the seats of all subjects.
- Additionally, every dictator/proposer got a pair of scissors and a red pen.
- In the treatments anonymous I and II, there were blinds arranged at the seats of the players.
- In the baseline treatments, the players made their decisions on seats without blinds and then went to seats with blinds to spend their waiting time.
- In the anonymous II treatments, the experimenter was sitting behind a blind when the waiting time started.

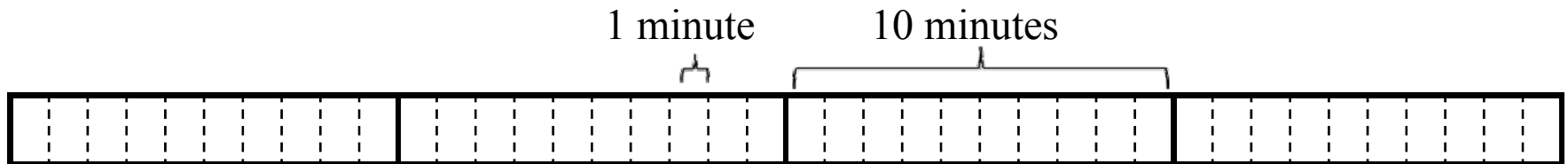


4. Design: Before the Experiment

- 16 subjects were divided into two groups, 8 per room.
- After having arrived, the subjects drew a number which determined their seat number.
- In the first 10 minutes of the experiment, each subject received an instruction, which included:
 - The apparent subject of the experiment: time perception.
 - The rules of the game (optionally with an assurance of anonymity).
 - The rules for the waiting time: No conversation, no leaving of the room, no bags, no watches.
- If there were any questions, the experimenter answered them.

4. Design: Dictator Baseline

- Dictators and receivers were in the same room and were sitting side by side.
- Each dictator received a paper strip, that symbolized one hour of waiting time.



- The dictator marked the paper strip with a cross where he wanted and cut the strip through there. Then he gave one piece to the receiver and kept the other piece for himself.

4. Design: Dictator Baseline

- Then the players went behind their blinds, where each player waited according to the length of his paper strip.
- After waiting the correct amount of time, the players received a short questionnaire (age, sex, field of study/profession, time preferences).
- At the end of the experiment, each player received an envelope with the payment from the experimenter.

4. Design: Ultimatum Baseline

- The ultimatum game baseline proceeded analogically to the dictator game.
- However, the responder had the possibility to decide if he wanted to accept or reject the division suggested by the dictator.
- As soon as the proposer had cut his strip, and given one piece to the responder, this one noted his decision on a form.

4. Design: Dictator Anonymous I

- Two rooms, each with eight players, who were sitting behind blinds.
- The subjects were told that the receivers were in another room, but in reality, all subjects were dictators.
- The subjects divided the same paper strips as in the baseline treatment.
- Having divided the strips, they gave the parts for the receivers to the experimenter, who put them into envelopes that were labeled with the players' seat numbers.
- A carrier seemingly brought the envelopes to the receivers in the other room.
- Then the subjects waited, filled out the questionnaires and received their payment like in the baseline treatment.

4. Design: Ultimatum Anonymous I

- Passed like the accordant dictator game, but with real responders.
- Having received their parts of the paper strips, the responders noted on forms with carbon copies if they accepted the division suggested by the proposers.
- Then they gave the carbon copies to the experimenter, who put them into the envelopes with the player`s seat numbers, and kept the original forms for themselves.
- A carrier passed the envelopes to the other room, where the experimenter gave the carbon copies to the accordant players.
- Then the subjects waited, filled out the questionnaires and received their payment like in the baseline treatment.

4. Design: Dictator Anonymous II

- In this treatment, there were again only dictators.
- Each dictator received a paper strip, and additionally two envelopes:
 - Envelope A for himself
 - Envelope B for the receiver
- The dictators cut the paper strips and put the two pieces into the two envelopes. So, the experimenter could not see their decisions.
- Then the dictators gave the envelopes B to the experimenter.
- The experimenter put the envelopes B into envelopes that were labeled with the players' seat numbers.

4. Design: Dictator Anonymous II

- A carrier seemingly went next door to the receivers to give them their envelopes.
- As soon as the waiting time started, the experimenter disappeared behind a blind.
- When the waiting time was over, the players gave their envelopes A to the experimenter through a slot in the blind.
- The experimenter controlled if the players had been waiting correctly, without being able to identify the subjects. Then he gave out the questionnaires.
- As soon as the players had filled out the questionnaires, they gave them back to the experimenter through the slot in the blind. Then they received their payment.

4. Design: Ultimatum Anonymous II

- The proposers got envelopes with the label B, the responders got envelopes with the label A.
- When the proposers had cut their paper strips, they put the pieces for the responders into envelopes B.
- The experimenter collected the envelopes B and put them into envelopes that were labeled with the players' seat numbers.
- The envelopes were brought into the other room, where each responder was given his envelope B.
- The responders had forms with carbon copies, on which they noted if they accepted the division.

4. Design: Ultimatum Anonymous II

- After filling out the forms, they put the carbon copies into envelopes A and the original forms into envelopes B.
- Envelopes A were collected by the experimenter, who put them into envelopes with the players' seat numbers.
- A carrier then referred them to the proposers.
- Then, all players started waiting.
- Later they gave their envelopes, that contained the paper strips and the forms to the experimenter, to the experimenter behind the blind and got the questionnaire. After filling out, they received their payment.

4. Design: Questionnaire

1. Stellen Sie sich vor, dass Sie in einem Wettbewerb 1000 € gewonnen haben. Sie können sich die 1000 € sofort ausbezahlen lassen oder warten und sich einen höheren Betrag ausbezahlen lassen. Wie hoch müsste der ausbezahlte Betrag sein, wenn Sie

1 Monat auf die Auszahlung warten? _____ €

6 Monate auf die Auszahlung warten? _____ €

(vgl. Fuchs 1982: 97 f.)

→ Calculation of the time preference rate p via the formula

$$u_{t+n} = u_t (1 - p)^n \Rightarrow p = 1 - \sqrt[n]{\frac{1000}{u_t}}$$

4. Design: Questionnaire

2. Wie trifft die folgende Aussage auf Sie zu? „Manchmal gebe ich Geld für Dinge aus, die ich nicht wirklich brauche und die ich mir in dem Moment eigentlich nicht leisten kann.“

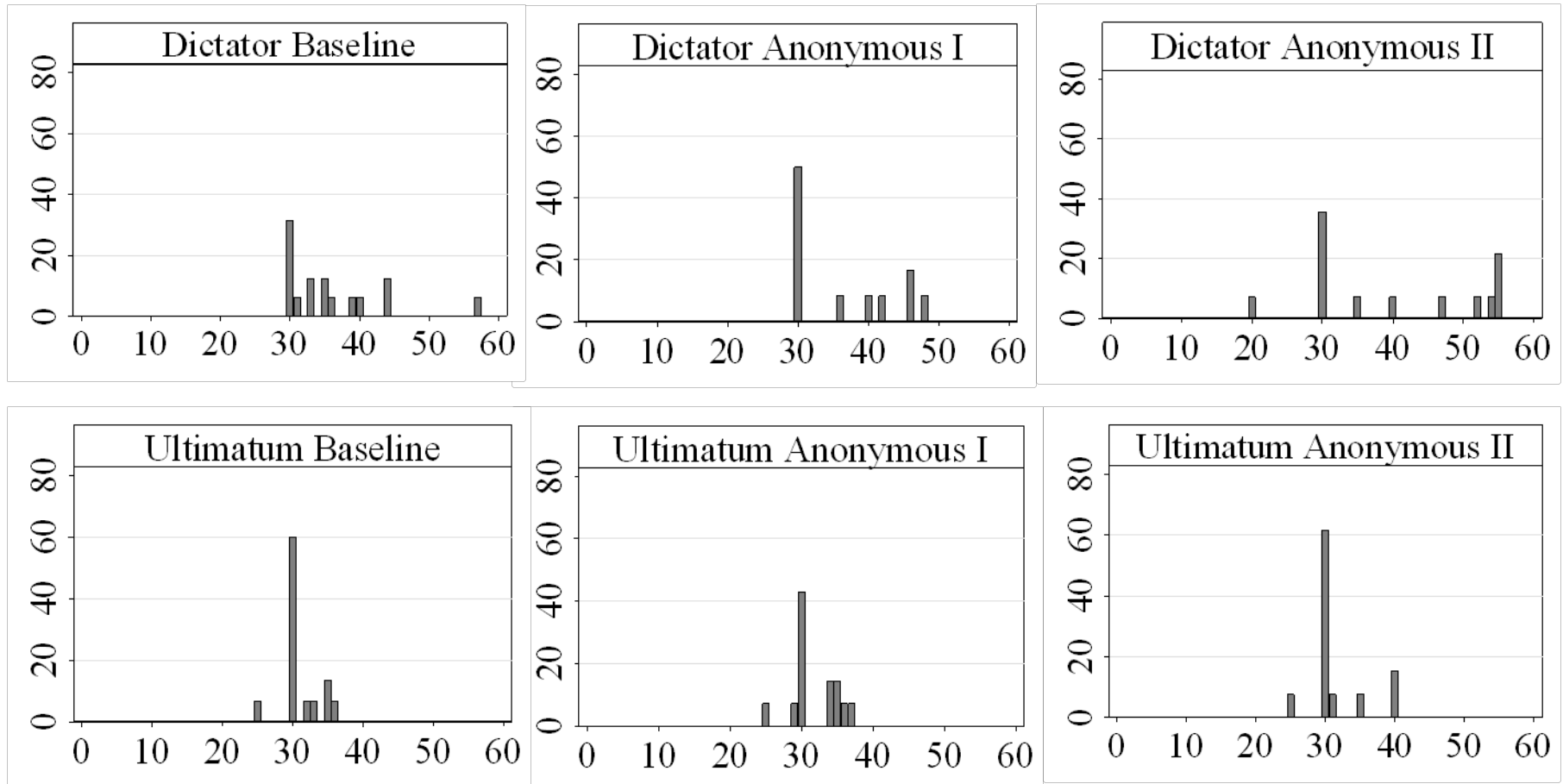
Trifft überhaupt nicht zu Trifft eher nicht zu Trifft eher zu Trifft zu
☐ ☐ ☐ ☐

3. Wie alt sind Sie? _____ Jahre

4. Sind Sie...? ☐ männlich
 ☐ weiblich

5. Was ist Ihr Studienfach (Hauptfach)? _____

5. Results: Proposer/Dictator Decisions



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Linear regression with robust estimators, without extreme cases	
F = 13.41	p < 0.001 R² = 0.4108 n=83
Dep. var.: size of offer in minutes	coefficient
punishment	- 8.79 *
anonymous I	0.64
anonymous II	1.32
constant	35.42 ***

Controlling for gender, centered age, quadratic centered age, centered time preference rate, impulsivity, centered room temperature, centered time.

5. Results: Responder Decisions

Degree of anonymity	Decision of the responder	
	accept	reject
Baseline	100 %	0 %
Anonymous I	100 %	0 %
Anonymous II	92.31 %	7.69 %
Total	97.62 %	2.38 %

6. Summary and Conclusions

- Bargaining about losses by proposers and dictators does not differ from similar experimenting with (windfall) money.
 - Anonymity has no significant effect on size of offers.
 - Fear of rejection leads to more fair decisions.
- **Experimenting with time costs does not lead to different results than experimenting with money.**

Thank you for your attention!

Appendix

Linear regression with robust estimators, without extreme cases

F = 13.41

p < 0.001

R² = 0.4108

n=83

De. var.: size of offer in minutes	coefficient		coefficient
punishment	-8.79 *	impulsivity: disagree	1.53
anonymous I	0.64	impulsivity: agree	3.26
anonymous II	1.32	impulsivity: strongly agree	-4.03
sex	0.52	centered temperature	0.27
centered age	0.09	centered time	-0.99
quadratic centered age	0.07 **	constant	35.42 ***
centered time preference rate	5.79		