Decisions Under Risk are Decisions Under Complexity

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Overview

This replication package includes

- Three Qualtrics .qsf files that were used to run the experiments, included in the Software folder.
- Ten raw data files in .csv format that are the direct output from Qualtrics (contained in the Data/raw subfolder), with personal identification material removed and new random IDs inserted in appropriate fields.
- One main working data file in .csv format, DATA.csv, generated from the ten raw data files (included in the "Data" folder).
- One R program (in the Code folder), Installation.r, used to import R libraries used in the analysis.
- One R program, form_dataset.R that transforms the raw data files in the Data/raw folder into the main DATA.csv file in the Data folder.
- Six R parser programs used by form_dataset.R to parse the raw data during the assembly of DATA.csv
- One R program (in the Code folder), analysis.R, used to produce all of the figures, tables and statistics in the paper using the main DATA.csv file.

Data Availability and Provenance

Experiments were run using the three clearly labelled Qualtrics .qsf files included in the Software folder: one for experiments using multiple price lists (MPLs), another for experiments using BDM elicitations and a third for the 4-Box robustness treatment. These files include the entire experiment including instructions.

Subjects in the main experiment and the BDM robustness treatment were recruited from Prolific in April 2023. Subjects in the 4 Box robustness treatment were recruited from Prolific in May of 2022.   Subjects in the Student robustness treatment were recruited from the UC Santa Barbara subject pool in February and March of 2021.

All raw data from the experiment (appropriately anonymized) is assembled in the Data/raw subfolder. The cleaned, working dataset DATA.csv is in the Data folder.

Statement about Rights

I certify that I have legitimate access to, permission to use and permission to distribute the data used in this manuscript.

Details on Data

The working data file (DATA.csv) is in long format with each row representing a Treatment-Subject-Task combination. They contain the following variables used in the analysis:

- session: session of data collection
- mirrorFirst: binary variable that is TRUE if subjects were assigned the Mirror treatment first.
- ID: a unique subject identifier
- boxes: the number of boxes (100 or 4) used to describe the lotteries/mirrors
- imistake: a binary variable that is TRUE if the subject received instructions that contained a typo in one of the examples.
- pred: the risk/loss neutral benchmark
- prob: the percentage chance of receiving the higher payment in the lottery.
- type: a variable for the type of lottery/mirrors. G are gains lotteries/mirrors, L are loss lotteries and A are mixed/loss aversion lotteries/mirrors.
- taskName: a unique identifier for the lottery/mirror task
- CR1, CR2, CR3: answers submitted in post-experiment cognitive reflection tasks.
- sex: sex of subject.
- major: post-experiment question on college major.
- math: post-experiment question about mathematical background.
- economics: post-experiment question related to exposure to economics.
- cuM: post-experiment likelihood subjects assign to having made optimal choice in a random mirror.
- cuL: post-experiment likelihood subjects assign to having made optimal choice in a random lottery.
- precisionL: post-experiment Likert scale on precision of lottery choices.
- precisionM: post-experiment Likert scale precision of mirror choices.
- similarity: post-experiment question about similarity of Lottery/Mirror strategies.
- attnBoxL: post-experiment Likert scale on attention paid to numbers of boxes/probabilities in lotteries.
- attnBoxM: post-experiment Likert scale on attention paid to numbers of boxes/probabilities in mirrors.
- attnPayL: post-experiment Likert scale on attention paid to payoff numbers in lotteries.
- attnPayM: post-experiment Likert scale on attention paid to payoff numbers in mirrors.
- repeated: was the task repeated
- mirror: decision given to the mirror version of the task.
- lottery: valuation given to the lottery version of the task.
- r_mirror: valuation given to the repetition of the mirror version of the task (if one occurred)
- r_lottery: valuation given to the repetition of the lottery version of the task (if one occurred)
- time_mirror: response time in the mirror version of the task.

- time_r_mirror: response time in the repetition of the mirror version of the task (if one occurred)
- time_lottery: response time in the lottery version of the task.
- time_r_lottery: response time in the repetition of the lottery version of the task (if one occurred)
- noiseL: subject-wise average absolute deviation between choices in the repeated lottery.
- noiseM: subject-wise average absolute deviation between choices in the repeated mirror.
- noise: subject-wise average absolute deviation between choices in both lotteries and mirrors.
- elicitation: method of elicitation (MPL or BDM)
- multiplier: a normalizing variable for the direction of deviations from expected value predicted by the classical pattern.
- treatment: the experimental treatment:
  - main is the main treatment
  - bdm is the BDM robustness treatment
  - 4box is the 4-Box robustness treatment
  - student is the student sample treatment
  - error is the original data collected for the main treatment prior to the discovery of the instructions typo

The raw Qualtrics download files used to construct this dataset are included in the Data/raw folder.

Computational Requirements

The analysis is entirely conducted in R (v. 4.0.2). The required R libraries are all imported by the using the Install.R file. The computational resources required to run the analysis.R and form_dataset.R files are trivial and the entire analysis should take only a few minutes on any computer.

Description of Programs.

The experiment requires Qualtrics, using the .qsf files provided with the replication package. MPL.qsf is the software for the main multiple price list (MPL) design. BDM.qsf is for the BDM robustness treatment. MPL_4Box.qsf is for the 4 Box robustness treatment.

The program form_dataset.R uses several parsing programs in the Code/Parsers folder to form the main working dataset, DATA.csv using the raw Qualtrics output (stored in Data/raw).

All of the data analysis reported in the paper, including the Figures, summary statistics and statistical tests, were performed with R (v. 4.0.2). The entire analysis is documented and organized chronologically by section of the paper in the file analysis.R.

Both form_dataset.R and analysis.R call the program Installation.R to import the R packages/libraries used in the analysis. This includes the R packages dpylr, magrittr, readr, tidyverse, scales, jsonlite and stringr.

Instructions to Replicators

To replicate the data analysis:

- Replace "replace with your path" in the first line of analysis.R with a path to the replication folder on your machine.
- To replicate results from the paper, run segments of the code in analysis.R. The code is organized by section of the paper and documented in detail to highlight each Figure, statistic and test. Figures are saved by the software in pdf form in the empty Figures folder.

To replicate the building of the working dataset, DATA.csv, from the raw data.

- Replace "replace with your path" in the first line of form_dataset.R with a path to the replication folder on your machine.
- Run the entire program.

List of Tables and Figures

Figure/Table	Program	Line Number	Location
Figure 1	analysis.R	316-318	Paper
Figure 2	analysis.R	353-355	Paper
Figure 3	analysis.R	404-406	Paper
Figure 4	analysis.R	430-432	Paper
Figure 5	analysis.R	513-515	Appendix
Figure 6	analysis.R	579-581	Appendix
Figure 7	analysis.R	637-639	Appendix
Figure 8	analysis.R	677-679	Appendix
Figure 9	analysis.R	696-698	Appendix
Figure 10	analysis.R	754-854	Appendix
Figure 11	analysis.R	1057-1063	Appendix
Figure 12	analysis.R	1090-1092	Appendix
Figure 13	analysis.R	1126-1128	Appendix
Figure 14	analysis.R	1145-1147	Appendix
Figure 15	analysis.R	1198-1260	Appendix
Figure 16	analysis.R	1317-1326	Appendix

References

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