Choosing the most attractive date: an optimal stopping problem

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Introduction

- Many real-world decisions involve options presented in series, and only having the opportunity to choose an option when it is presented.
- When is the optimal time to stop evaluating new information and commit to a decision? → **optimal stopping problem.**
- Ideal observer model: computational optimality benchmark.
- **Undersampling:** stop too early, fail to get the best outcome.
    - Classic best choice task: a sequential sampling tasks where participants have to find a high ranking item from a list of textually-presented numeric options.
- **Oversampling:** stop too late, fail to get the best outcome.
    - Fiancée task: a variation of the optimal stopping task where people are required to stop at the most attractive face in a sequence.

Aim

- The original undersampling bias in optimal stopping tasks has never been conclusively explained and the new results on attractive faces only raise more questions.
- **When does over/undersampling occur?**
- Online version of the fiancée task.
    - Increased the generalizability (diverse demographic).
    - Increased the statistical power.
    - Minimized the costs.

Methods

The design of the fiancée task, which was originally created in Matlab, was replicated in **Gorilla**.

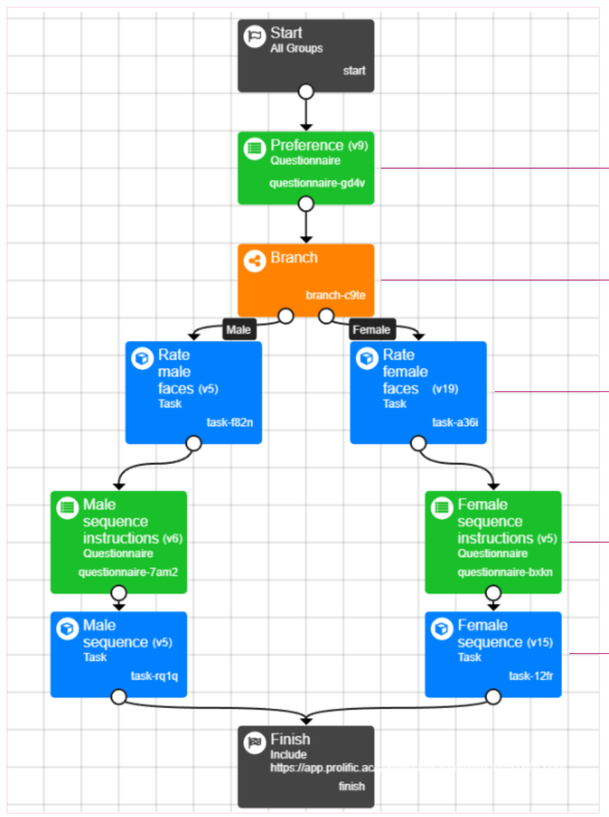

Figure 1. Experiment tree in Gorilla.

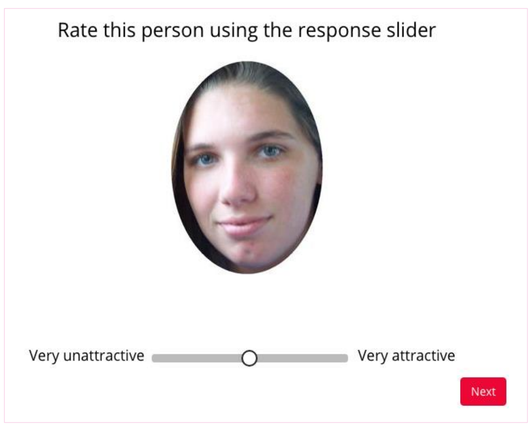

Figure 2. Example of rating a female face.

Phase 1. Participants were asked to rate **90 different faces** of their preferred sex (i.e. which sex they would like to date) on their attractiveness. Phase 1 allows us to rank order the choice options in the sequences by each participants' own personal preferences, while informing participants and computational models of the distribution of attractiveness values, from which the sequences in phase 2 will be generated.

Phase 2. Participants encountered 8 faces in sequence and they had to accept or reject each one as their date. They were shown a total of **6 sequences**. The primary two measurements are (1) the number of faces sampled before choice, and (2) the rank of the chosen face. By analysing the position and rank of the chosen image, we can determine whether people sample differently compared to an ideal observer model, and whether their strategy is effectively suboptimal.

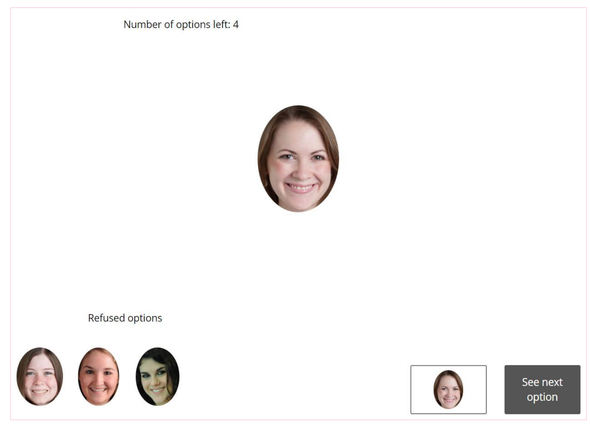

Figure 3. Example of a sequence with female faces.

- N = 19 participants.
- Recruited through Prolific and paid in accordance with the minimum reward of £5.00 per hour.
- English speaking countries.
- 18-30 years of age.

Future experiments

This experiment is part of a larger study in which it is only **one of three conditions.** The other two conditions are as follows.

- **Classic best choice task.** Online replication of the classic best choice task; the number-based task in which participants are expected to show an undersampling bias.

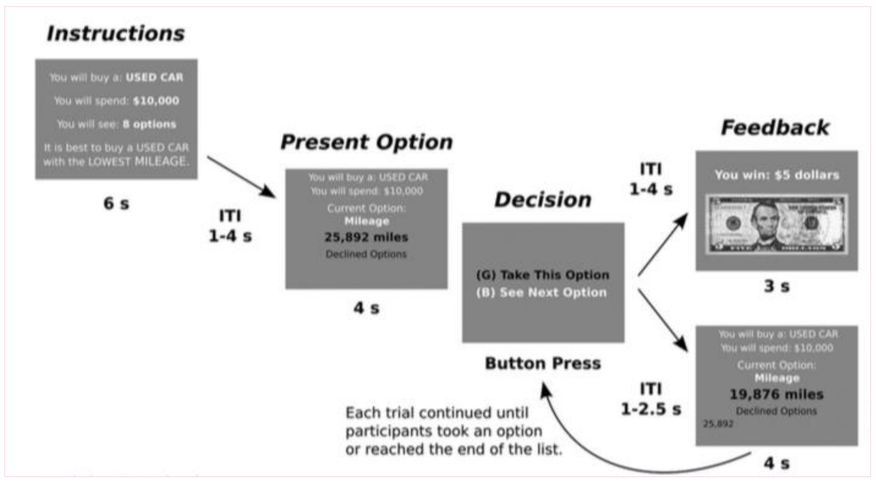

Figure 4. Classic best choice task (Costa, & Averbeck, 2013).

- **New variation of the fiancée task.** Phase 1 is the same as the classic fiancée task. At phase 2, however, participants will view sequences in which each face is replaced by the numeric rating assigned in phase 1. This paradigm will test whether participant bias relates to the textual-numeric versus image-based nature of the stimuli or to differing probability distributions of options values.

References

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