

Conjunction Fallacy

An Error In the Human Perception of Probability

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How is probability defined?

- *The likelihood of an event or series of events happening.*

When talking about probability and how humans see it:

- There is no **correct probability**.
- Heuristics: *mental shortcuts that can facilitate problem-solving and probability judgments*¹

¹from <https://thedecisionlab.com/biases/heuristics> ▶ ◀ ≡ ▶ ◀ ≡ ▶ ≡ ↺ 🔍 ↻

Some examples

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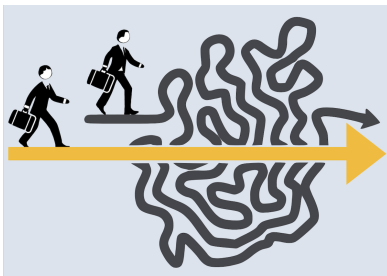
References

Availability Heuristic

Decisions of probability based on how easily remembered situations of an event are

Representativeness Heuristic

Decisions based on comparisons to a mental prototype



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The mistaken belief that two events are more likely to happen than one event or the other

ex.

The ing vs n experiment (Tversky Kahneman, 1973)



Design

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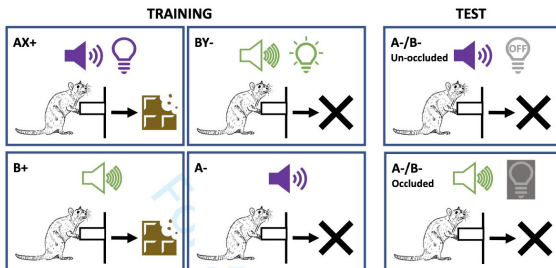
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The design of this project is inspired by
The conjunction fallacy in rats

The basics are the same but I made it more suited for humans.



Data

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Below is the table with all my data. Each column represents a choice and a background color.

Player	Answers	D1	D2	L1	L2
1	12	5	2	3	2
2	11	2	4	4	1
3	11	3	2	3	3

Table: Experiment Results

Interpreting the Data

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From the data gathered , we can see some interesting preferences.

- Player 1:
 - prefers to go right with a dark background
 - has no preference with a light background
- Player 2:
 - Prefers left on a dark background
 - Prefers right on a light background
- Player 3
 - Goes left to right without concern for background

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Conjunction Fallacy is seen everywhere.

Stop and think about an important decision with this knowledge and see how it affects you

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- [3] Why do we take mental shortcuts?
- [4] V.V. González, S. Sadeghi, and L. et al Tran. The conjunction fallacy in rats. *Psychonomic Bulletin Review*, 2023.
- [5] Hans Hansen. Fallacies. *The Stanford Encyclopedia of Philosophy*, 2023.
- [6] Amos Tversky and Daniel Kahneman. Judgment under uncertainty: Heuristics and biases. *Science, New Series*, Vol. 185, No. 4157, 1974.