Did I really overcome the illness?
Individual differences in outcome categorization can explain variation in causal judgment biases

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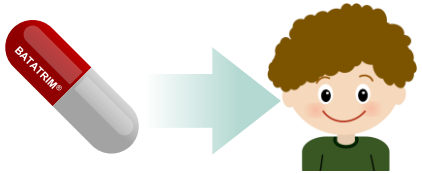
Introduction

Causal learning

People can use the contingency between causes and outcomes to assess causality.



Cause (medicine) — Outcome (healing)

Outcome-density bias

When the outcome occurs frequently, i.e., **high P(Outcome)**, people tend to **overestimate causality**. Even if the causal link is null, causes are systematically perceived as effective.

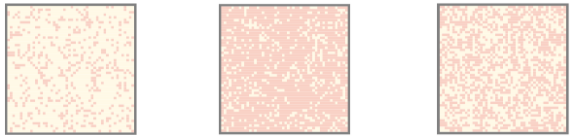
Ambiguous outcome detection

Previous experiments used binary outcomes (healed/not healed) that are easily interpretable. However, in real life, **it is not always clear when the outcome has occurred**. If my coughing symptom is improving but not completely disappeared, would I conclude that I have overcome the illness, or that I am still ill? Outcomes are often ambiguous. Moreover: if people spontaneously differ in their interpretation of ambiguous outcomes, then they would differ also in the frequency with which they report detecting the outcome, i.e., their *subjective* P(Outcome). This could in turn explain differences in the causal judgment.

Methods

Classification procedure

Stimuli consist of two-color matrixes (cell tissue samples). The ratio of light to dark cells determines whether the tissue is healed (outcome present) or not healed (outcome absent). However**, some stimuli are ambiguous as they contain exactly the same amount of light and dark cells** (ambiguous outcome).



Outcome present 80/20 — Outcome absent 20/80 — Ambiguous 50/50

During the task, people observe (a) whether the medicine was taken or not, and (b) the resulting tissue sample. Their task is to classify each trial by indicating whether the medicine was taken and whether they think the tissue was healed, without receiving feedback.
Thus, we can compute **a subjective P(Outcome) index** by counting the number of ambiguous trials treated as healings.

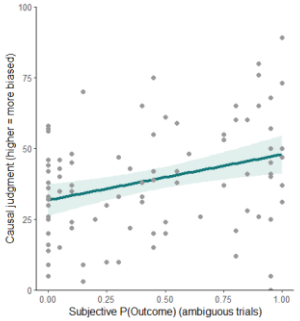
Causal judgment

After a series of 40 trials (20 ambiguous), people must judge the extent to which the medicine is effective on a 0-100 scale. The actual contingency between medicine and healings (attenting to non-ambiguous trials) was null (i.e., medicine was **completely ineffective**).

Results & Discussion

Subjective P(Outcome) predicts the judgment

N = 100 Psychology students.



Individual differences in the spontaneous categorization of ambiguous stimuli significantly predict the judgments: those **individuals with higher subjective P(Outcome) show stronger biases** in their causal judgments.

Discussion

Individuals who spontanoeusly tend to interpret ambiguous stimuli as outcome occurrences are effectively exposing tehmselves to higher P(Outcome) levels, thus increasing their bias. This could lead to erroneous beliefs in many domains, such as health decisions or belief formation.

Check the full paper here:

Blanco, F., Moreno-Fernández, M.M., & Matute, H. (2020). Are the symptoms really remitting? How the subjective interpretation of outcomes can produce an illusion of causality. *Judgment and Decision Making, 15*(4), 572-585.

Open data and materials