People use inverse planning to rationally seek social information from objects

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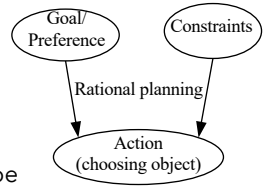
Introduction

People use objects as a source of social information: We accurately judge others' traits, interests, and social affiliations from their possessions[1]

Q: How do people seek social information from objects?

Hypothesis: Rationally, using inverse planning to reason about how objects were chosen

- *Inverse planning*[2]*:* Using the generative process (how each object was selected) to determine its informativity



- *Constraints as alternative explanations:* When options are limited, choices will be less informative about true preferences and traits

Prediction: If people rationally seek social information from objects, then when another person's choices are **less constrained**, the chosen object should be seen as holding **more social information**

- People should flexibly take into account multiple kinds of constraints:
  - *Number of available options (Exp. 1)*
  - The *range* of options, or extent of difference between items available (Exp. 1)
  - Number of *functional* options (Exp. 2)

Alternative: Simple heuristic: Always choose the object from a set with greater perceptual diversity between items

References

[1] Gosling, S. (2008). *Snoop: What your stuff says about you.* Profile Books.

[2] Baker, C. L., Jara-Ettinger, J., Saxe, R., & Tenenbaum, J. B. (2017). Rational quantitative attribution of beliefs, desires and percepts in human mentalizing. Nature Human Behaviour, 1(4), 0064.

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Experiment 1: Do people rationally seek social info. from objects?

Task: You're trying to learn about a stranger from what they chose out of a set of objects. Each trial shows two object sets (cards), with what they chose on the back.

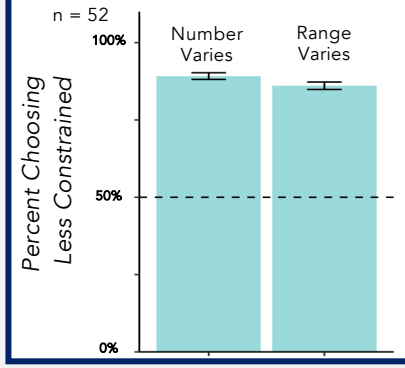
Manipulated across trials:

Number of options: OR Range of options:

Less constrained *More constrained* *Less constrained* *More constrained*

DV: Which card would help you learn more about this person?

4 types of stimuli to ensure generalizability: Shirts, chairs, writing utensils, hats



Result: Objects chosen from less constrained sets rated more socially informative. ($p < 0.001$)

Flexibly consider the number of available options, and the range of options (no difference between constraint types, $p = 0.2$)

Across multiple kinds of stimuli (no difference across stimulus types, $p = 0.09$)

Experiment 2: Is this via inverse planning or a simple heuristic?

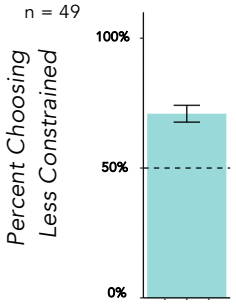
Task: Same as exp 1, but option sets are identical. Simple heuristic no longer works.

Manipulated across trials:

Context of choice (how many options in set function):

Less constrained *More constrained*

Same 4 types of stimuli as Exp. 1



Result: Objects chosen from less constrained sets, even if perceptually identical, rated more socially informative. ($p < 0.001$)

Conclusions

People rationally seek social information from objects: Even without knowing *which* object someone chose, people use *how* it was chosen (from what set of alternatives, and for what purpose) to determine how much social information it contains.

Inverse planning underlies our social inferences from objects: We consider the generative process (how others made their choices) to seek information about others in a rational way.