The price of knowledge: Children infer epistemic desires and rewards from exploratory behavior

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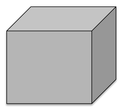
Introduction

When deciding whether to seek information, agents must consider both their need and desire for information, and its cost. Agents may choose not to seek out novel information when it's costly, or ignore cost when information is needed. Do children understand that exploratory behavior is determined not only by agents' epistemic states or desires, but also influenced by exploration's cost?

Procedure

Introduction:

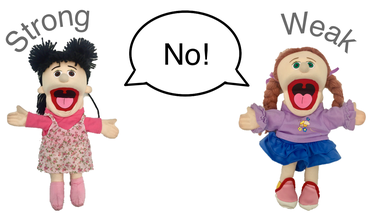
Participants are introduced to a strong and a weak puppet



Exploration:

"Would you like to lift this box to find out what's underneath?"

Experiment 1
(each puppet refuses to lift box)



Experiment 2
(each puppet agrees to lift box)

Test question:

Experiment 1:
"Who *already* knew what was under the box?"

Experiment 2:
"Who *really wanted* to know what was under the box?"

In two control experiments, we test whether children's responses are due to an association between strength and competence (e.g., Fusaro, Corriveau & Harris, 2011). We replicated Experiments 1 & 2, but left out the exploration phase. If children base their judgments on agents' actions *and* their costs, then they should fall to chance, having witnessed no exploratory choices.

Results

Experiment 1: both 4- and 5-year-olds judged that the strong agent already knew what was under the box.
Experiment 2: both 4- and 5-year-olds judged that the weak agent really wanted to know what was under the box.
Control experiments: in both studies, 4-year-olds always preferred the strong agent; 5-year-olds were at chance.

*because no age differences were observed in Experiments 1 & 2, we collected a single sample of 24 four- and five-year-olds for each control experiment (n = 12 4y's, n = 12 5yo's)

General Discussion & Conclusion

Across four experiments, we demonstrate that four- and five-year-olds do not rely on simple rules (e.g., ignorant agents seek information; knowledgeable agents do not) when inferring epistemic states or desires from behavior. Instead, children consider both others' information seeking decisions and their costs when deciding what others know, and what they want to know. While prior work has demonstrated that children can infer agents' beliefs about their desires from their actions (Jara-Ettinger et al., 2017), to our knowledge this is the first demonstration that young children also infer others' desires about their beliefs.

Future Directions:

- While four- and five-year-olds engaged in mental-state reasoning to solve our task, might younger children rely on a rule to infer others' mental states from their exploratory choices?
- Do young children also understand how non-physical costs may affect exploration?
- Will children make such inferences spontaneously, and apply them when deciding which of two agents is right?

References:
Fusaro, M., Corriveau, K. H., & Harris, P. L. (2011). *JECP, 110*(4) 561-574.
Jara-Ettinger, J., Floyd, S., Tenenbaum, J. B., & Schulz, L. E. (2017). *JECP: General*, *146*(11), 1574.