

# **From information-seeking actions (and their costs), adults jointly infer both what others know, and what they believe they can learn**

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## **Abstract**

We face a challenge when inferring what others know. Actions do not transparently reveal epistemic states: ignorant agents routinely ignore information too costly to obtain, and knowledgeable agents often confirm what they already know when it's convenient. We hypothesized that epistemic inferences are sensitive both to agents' actions, and the underlying utilities that best explain them. We tested this possibility in a simple task. Adults watched an explorer decide whether to collect a map before searching an island for treasure. Participants ( $n=40$ ) were asked to jointly infer how much the explorer knew about the treasure's location, and how much information the explorer believed the map had. Participant judgments matched a computational model of epistemic inference structured around an expectation that agents rationally tradeoff information gain with information cost ( $r=0.86$ ; 95%: 0.740.93,  $p<.001$ ). Our results suggest that adult Theory of Mind supports nuanced and graded epistemic inferences from observable action.