

Inducing and Detecting Cognitive Cost Effects

Submission ID 3000215
Submission Type Poster
Topic Cognitive Science
Status Submitted
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SUBMISSION DETAILS

Presentation Type Either Poster or Oral Presentation

Presentation Abstract Summary Cognition is an embodied biological process, subject to constraints of both energy and time. As such, individuals may opt for an action selection strategy that reduces working memory load and cognitive processing costs, despite equal or lower subsequent reward. Despite anecdotal evidence that humans are averse to cognitively demanding tasks, reliably detecting cognitive cost effects has proved elusive.

We detect a cognitive cost effect using a 1-Back task with a subset of blocks modified to include sequential structure in the target response. We found that many subjects rely on the stimulus structure despite a lack of net gain in accuracy, implying the reduction of a latent cost. We also find evidence that subjects simultaneously maintain both deliberative and procedural response strategies that compete for expression. Rather than explicitly switching between response strategies, our results suggest strategies are mixed, with cognitive costs continuously incorporated into weights to balance accuracy and expenditures.

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Keywords

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action selection
deliberation
decision making
cognitive cost