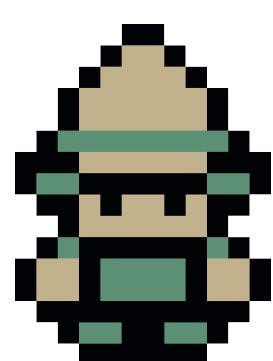


# From seeing to seeking: belief-based exploration in gamified environments



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## INTRODUCTION

- The brain doesn't passively perceive the world as it is — it actively *predicts* it, based on initially formed beliefs [1-3]



- Ideally, conflicting evidence should trigger belief updating
- In practice, we often show **confirmation bias**, favoring belief-consistent information [4-6]
- This bias is observed during free resampling of familiar images [7] and strengthens with confidence [8]

- But how does it extend to *novel* situations in a more ecologically-valid setting (while maintaining experimental control)?
- Here, we ask:

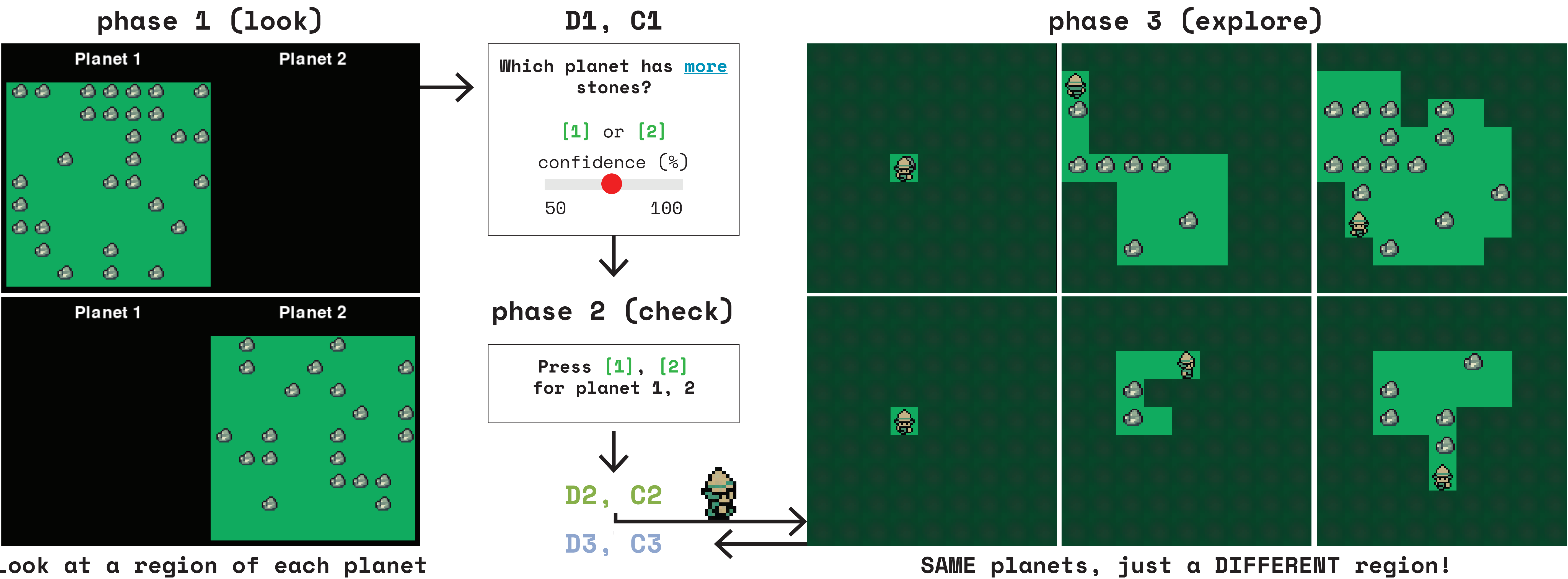
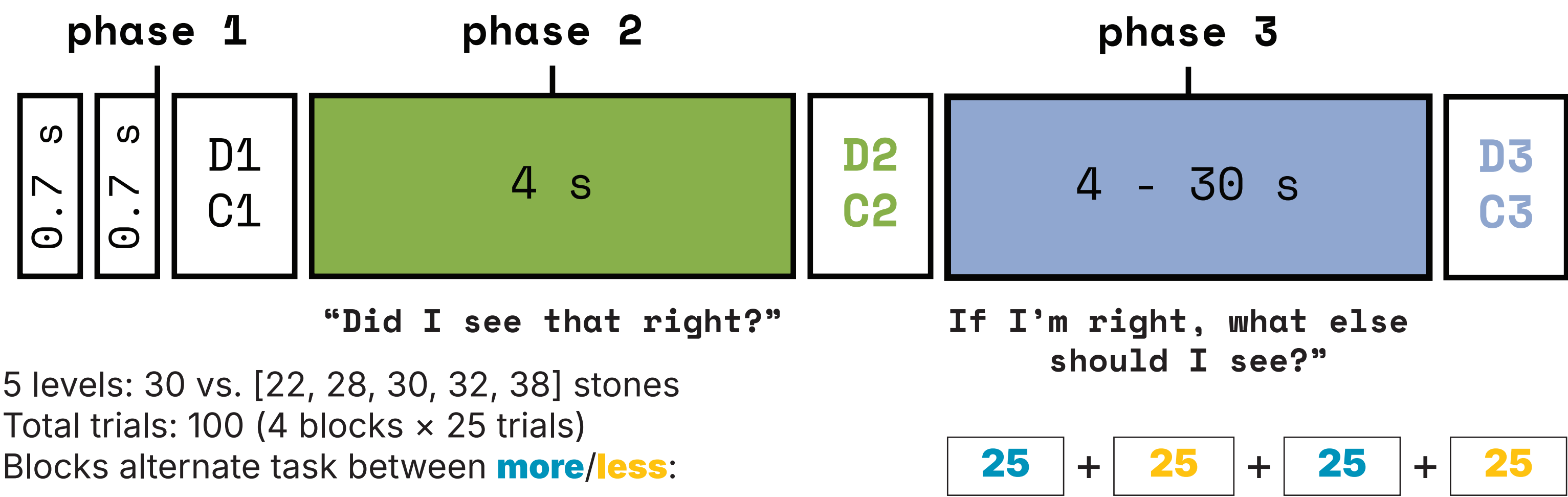
**How do beliefs and confidence shape how we sample familiar vs. novel evidence in partially-observable gamified environments?**

## METHODS

**Task:** figure out which of two planets has **more** (or **less**) stones.

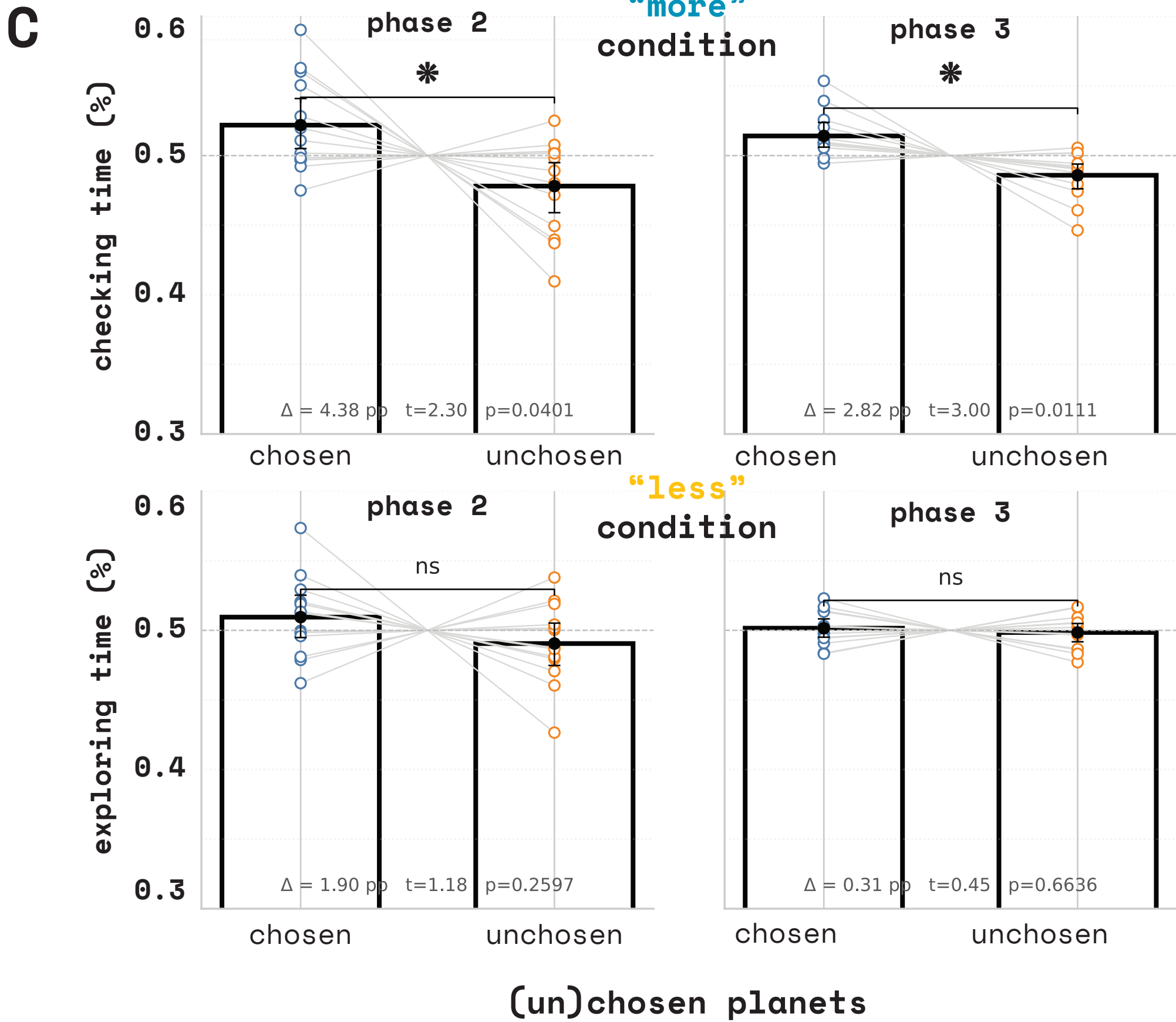
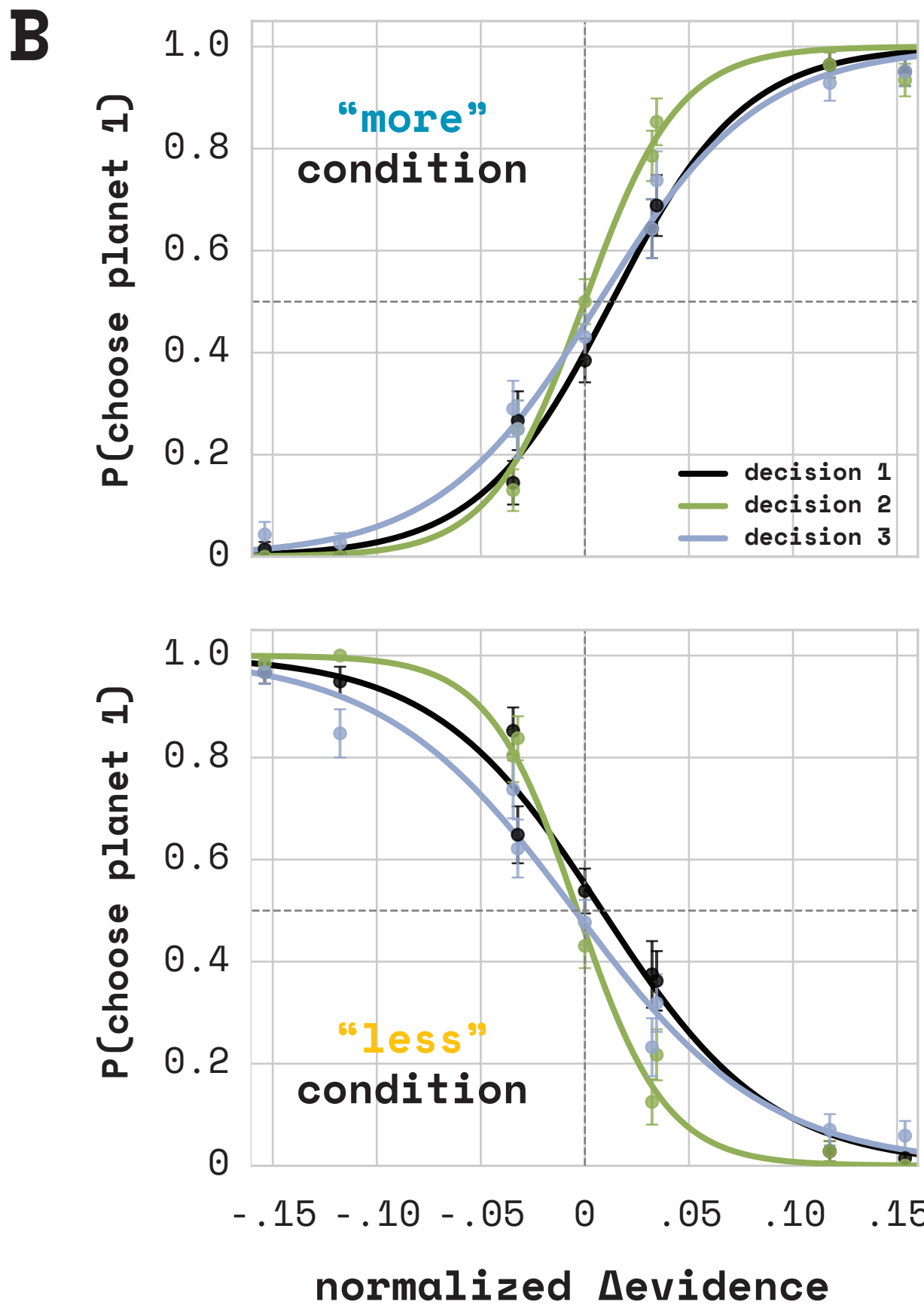
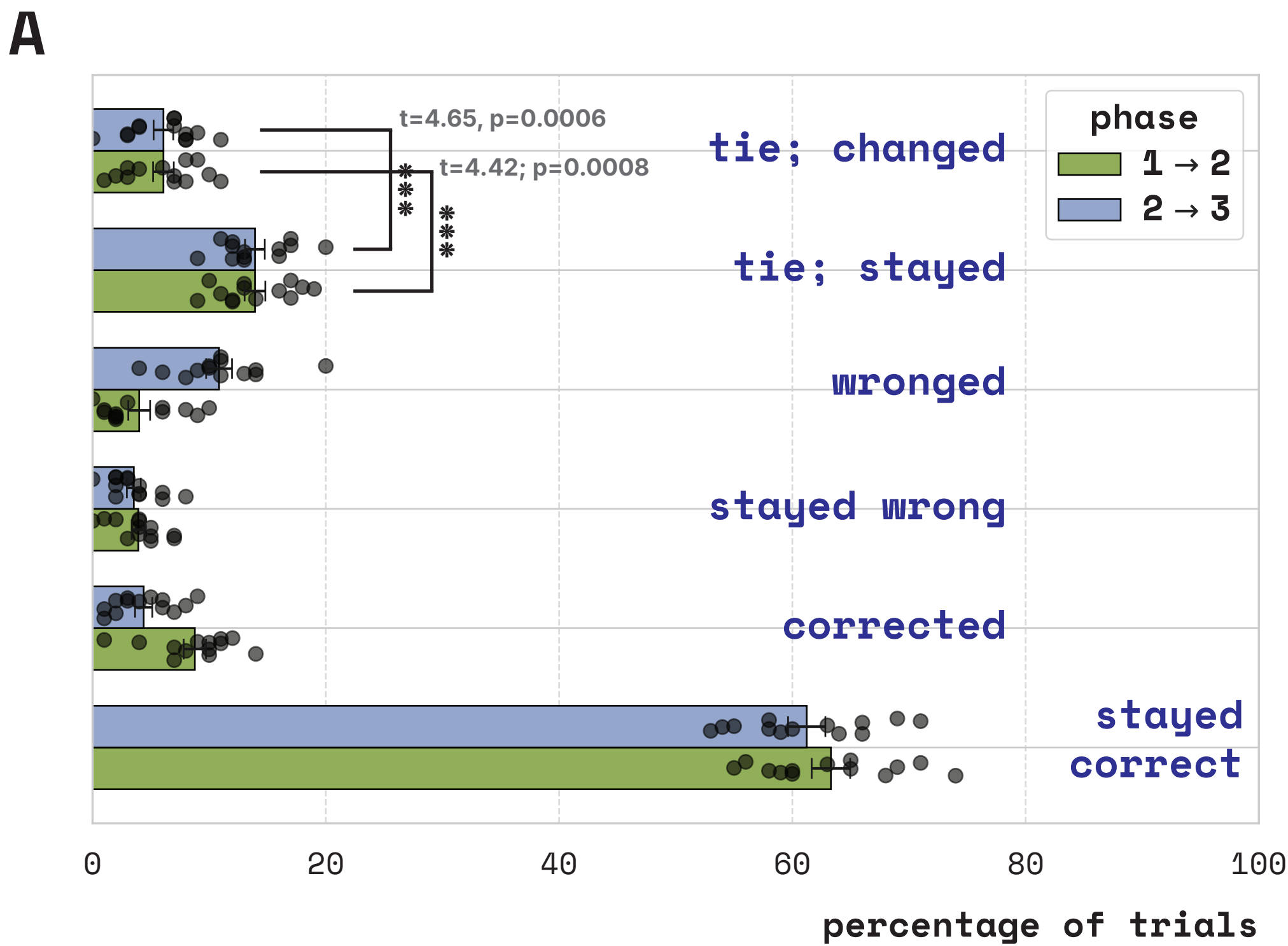
**A trial:**

- Phase 1: Look — quick, initial impression of planets 1 and 2
- Phase 2: Check — re-view the same visual info as phase 1 (*familiar* evidence)
- Phase 3: Explore — reveal new information about planets 1 and 2 (*novel* evidence)



## RESULTS

Preliminary data (**N=13**) show decision persistence and change across phases (**A**), consistent choice-evidence relationships (**B**) and condition-specific looking times (**C**).



## OUTLOOK

- Preliminary data: initial beliefs shape information sampling, even when collecting *new* evidence (phase 3), so they are self-reinforcing
- Gamified setting to capture and nudge belief-driven exploration
- “Tie; stayed” may reflect confirmation bias, whereas corrections and wronging indicate evidence-driven change
- In this sample, confirmatory sampling occurred only in the **“more”** condition, suggesting belief content modulates exploration
- Next: assess the role of **confidence** in shaping sampling behaviour
- Next: adapt the gamified paradigm for **artificial agents**

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