

Background

Looking reveals how people process information.

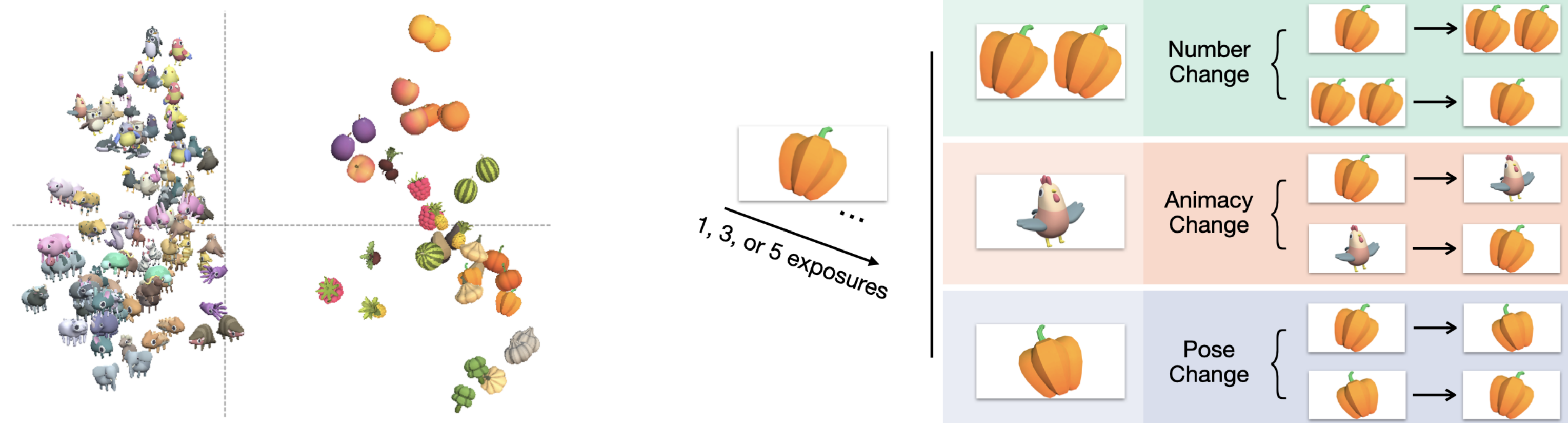
Habituation: decrease in response to a repeated or continuous visual stimulus over time.

Dishabituation: response increases again after observing a new stimulus.

What accounts for looking behavior during information processing?

RANCH: A stimulus-computable model of looking behavior

Raz, Cao, et al. (2025) built an image-computable model (RANCH) that predicts adults' and infants' looking behavior to a large stimulus set, including graded responses to changes in pose, animacy, and number. Despite having only a perceptual embedding space of stimuli, this model succeeded in predicting looking behaviors without being trained on the task.



Perceptual Space Used in RANCH model

Study Stimuli and Procedure in Raz, Cao, et al. (2025)

Research questions:

- What factors are driving changes in looking time?
- Is perceptual space sufficient to explain magnitude of dishabituation?

Hypotheses

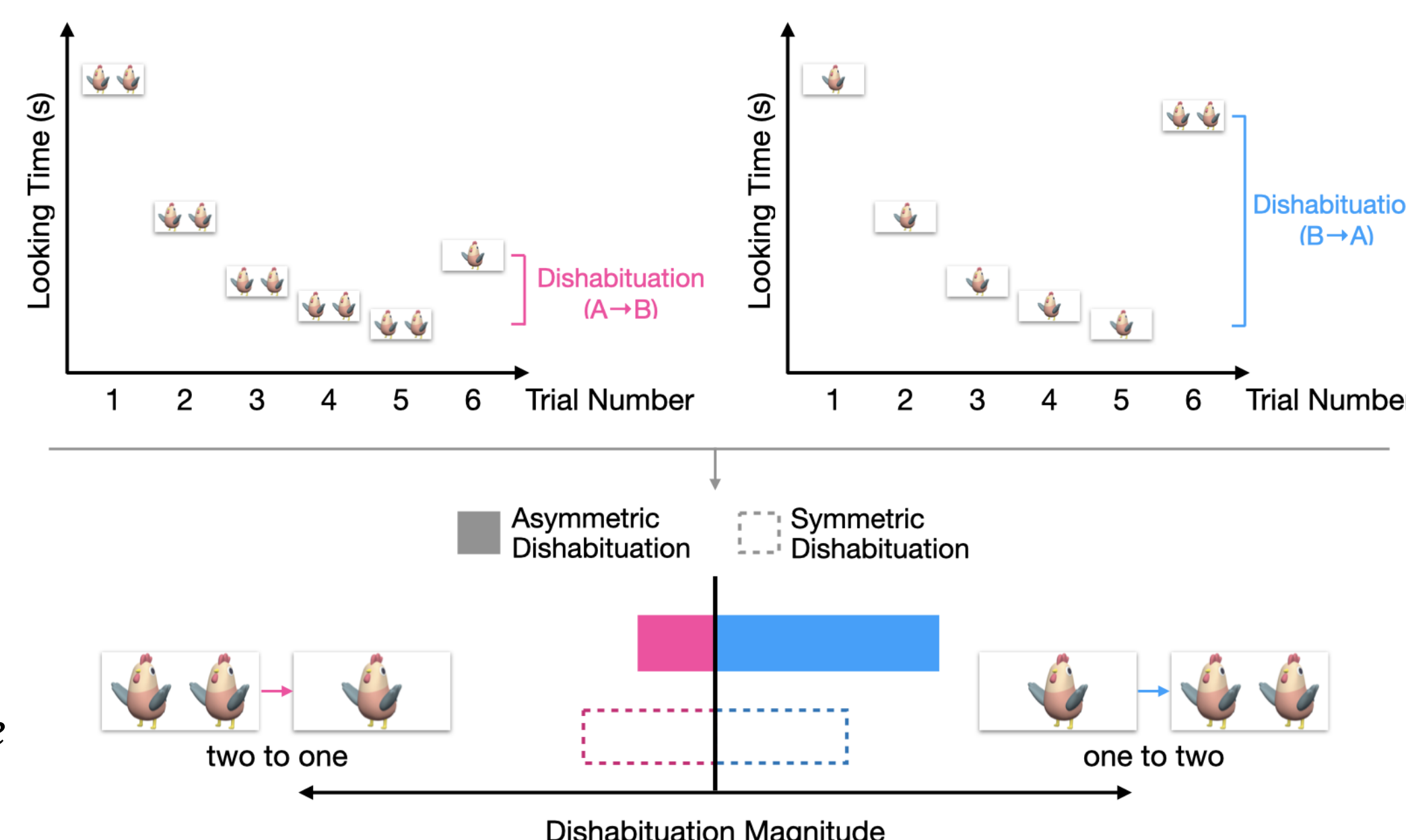
Perceptual-only account: predicts symmetric dishabituation.

Since the perceptual distance between two items is symmetrical, behavior guided only by perceptual space should also be symmetrical.

Beyond-perceptual account: predicts potential asymmetrical dishabituation.

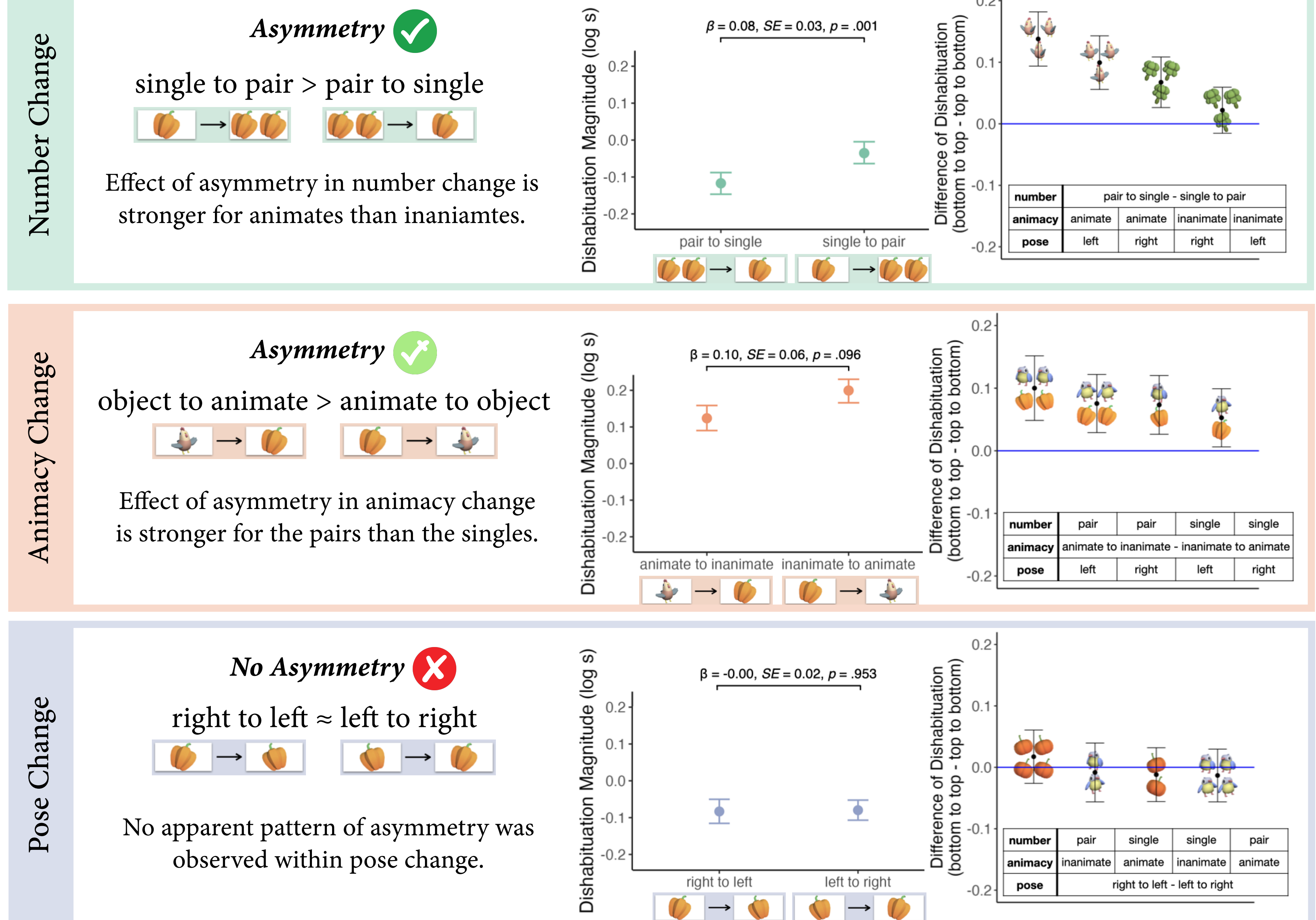
Factors other than perceptual distance could influence dishabituation; considering the potential underlying mechanisms of the change could lead to differences in dishabituation.

How to find out: Secondary data analysis on Experiment 2's dataset from Raz, Cao, et al. (2025)



Results

Model specification: $\text{lmer}(\text{dishabituation} \sim \text{fam_trial_number} + \text{block_position} + \text{change_direction} + \text{fam_img_baseline_preference} + \text{test_img_baseline_preference} + (1|\text{subject}))$



Conclusions

We conducted a secondary analysis of an adult dataset from Raz, Cao, et al. (2025), which embedded stimuli within a perceptual space and argued that perceptual distance drives looking behavior in adults and infants.

- Our findings suggest that perceptual distance alone does not fully account for adults' responses. Specifically, we observed asymmetrical looking patterns for number changes and, to a lesser extent, animacy changes.
- These asymmetries highlight the need to consider underlying conceptual mechanisms that may contribute to these effects.

Future directions: We will examine whether similar asymmetries appear in other datasets (e.g., infant behavioral studies and adult fMRI studies), and investigate underlying mechanisms driving asymmetrical dishabituation patterns.