

Asymmetry for shading direction in visual search persists in inattention blindness

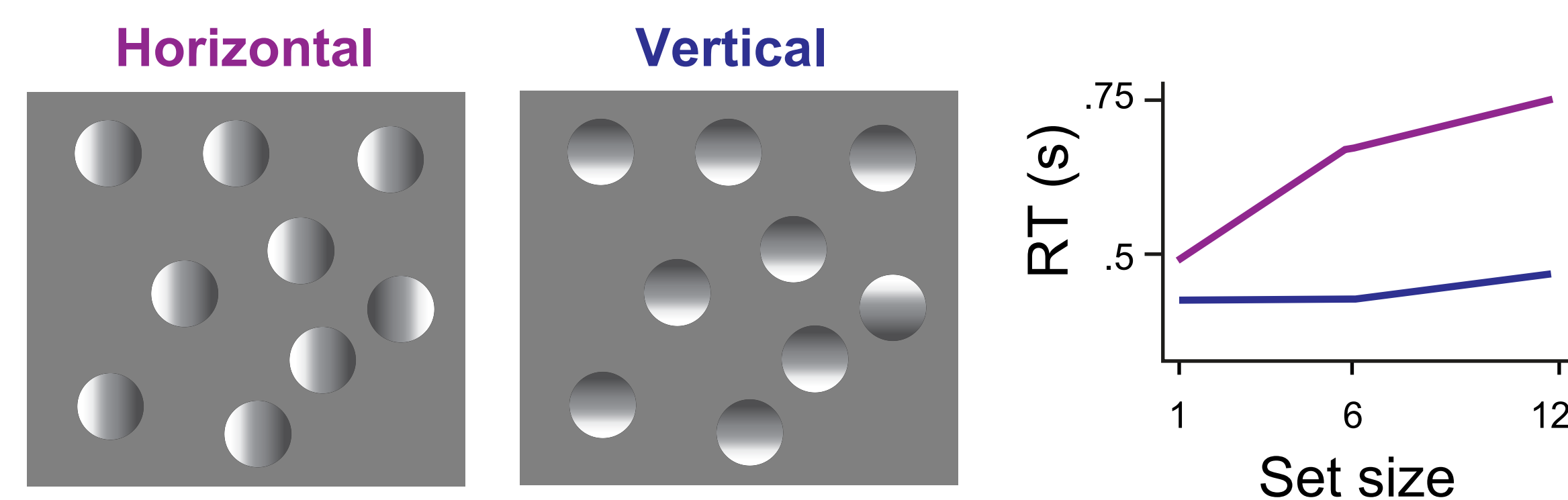
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Background

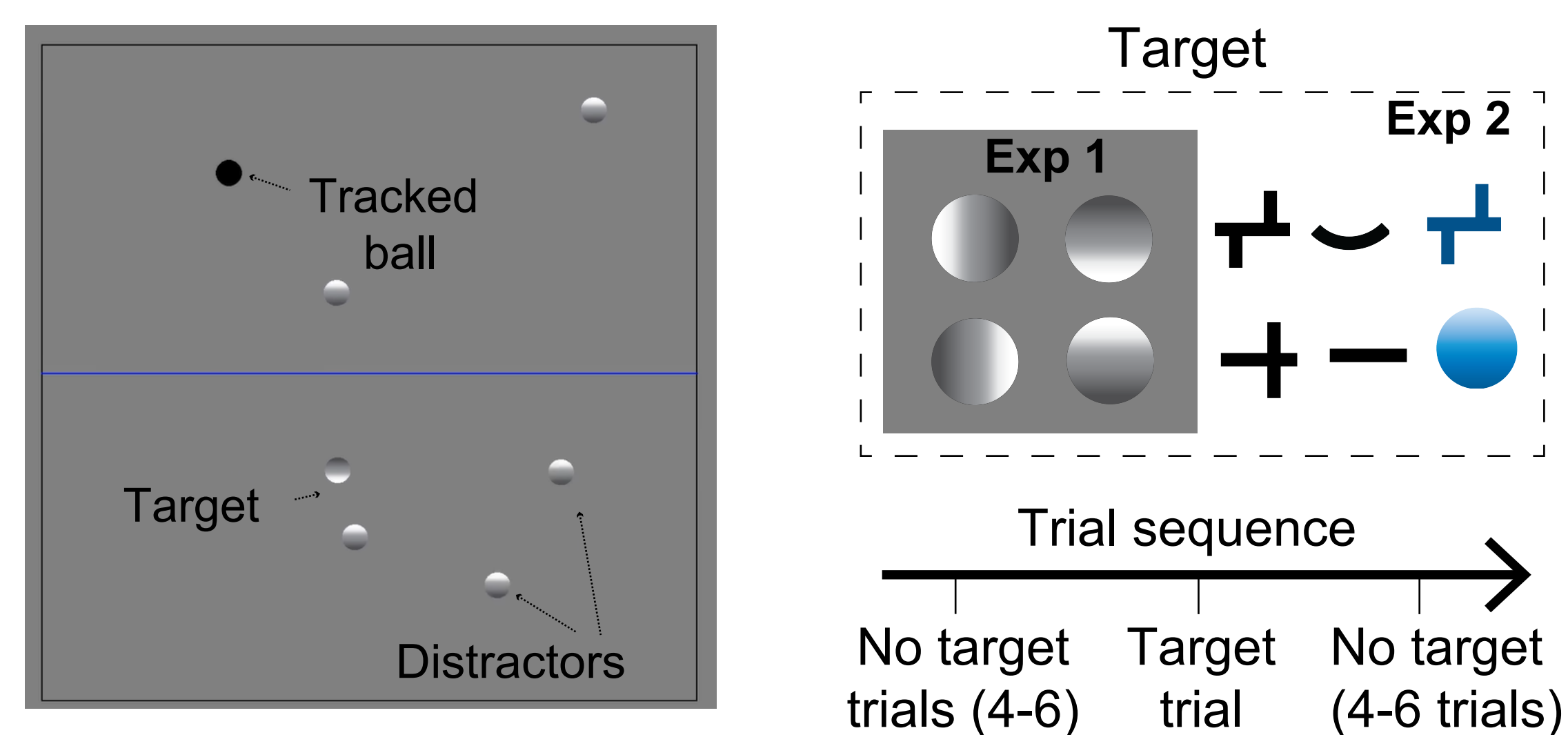
We live in a dynamic world. Among the various incoming information, some stimuli are easier to notice than others.

For example when searching among static shaded objects, subjects are better at noticing a reversed vertical shading than a horizontal one.



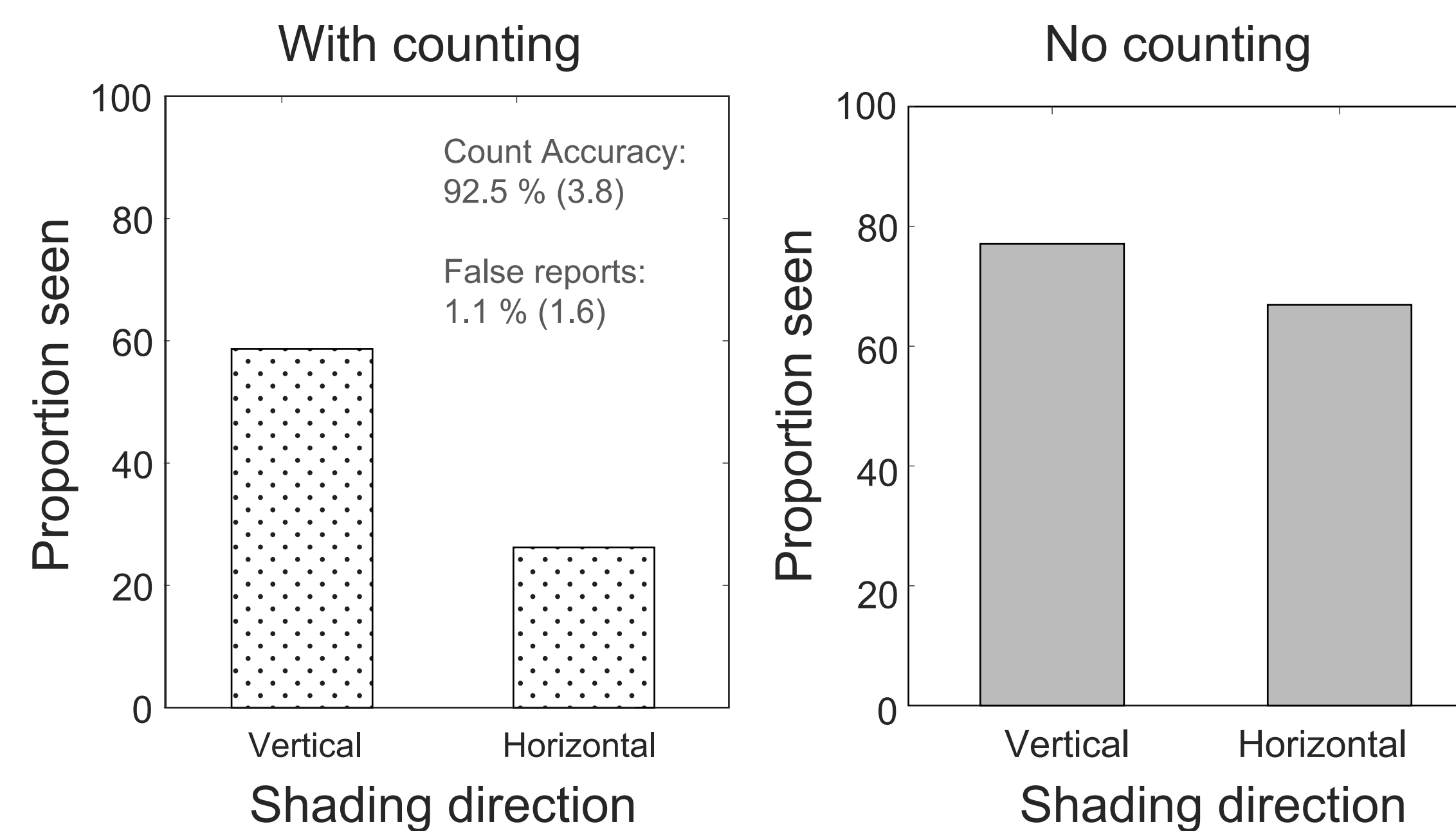
Here, we ask if this asymmetry will persist when we are preoccupied with a task.

Inattention blindness (IAB) task

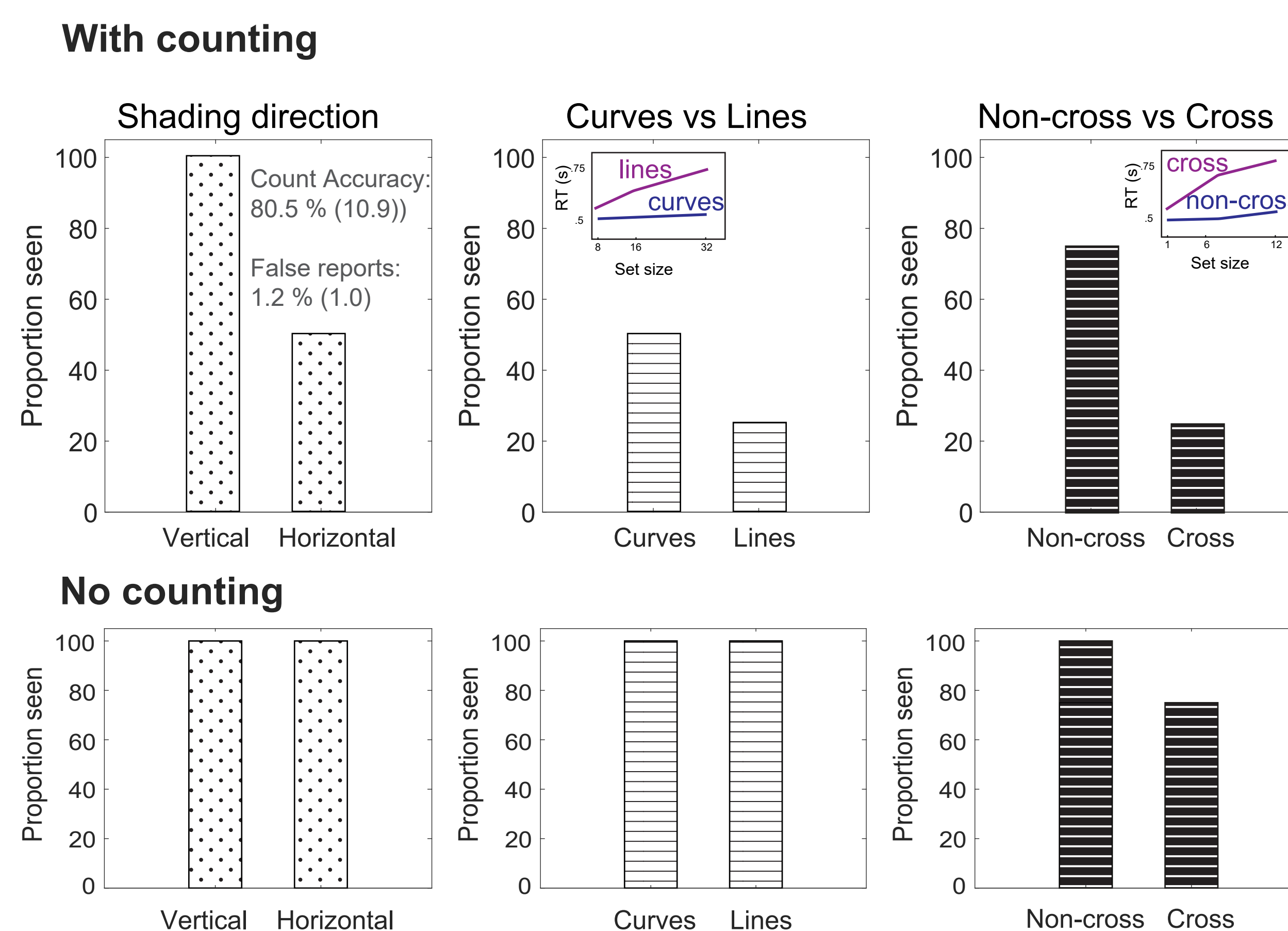


- Natural ball simulation (Exp 1: Brownian, Exp 2: Natural collision)
- Primary task is to count the number of midline crosses by the black ball.
- Press a button when they see an unexpected target.
 - > 25% occurrence; Exp 2 includes 6% color change targets
 - > random spatial and temporal onset.

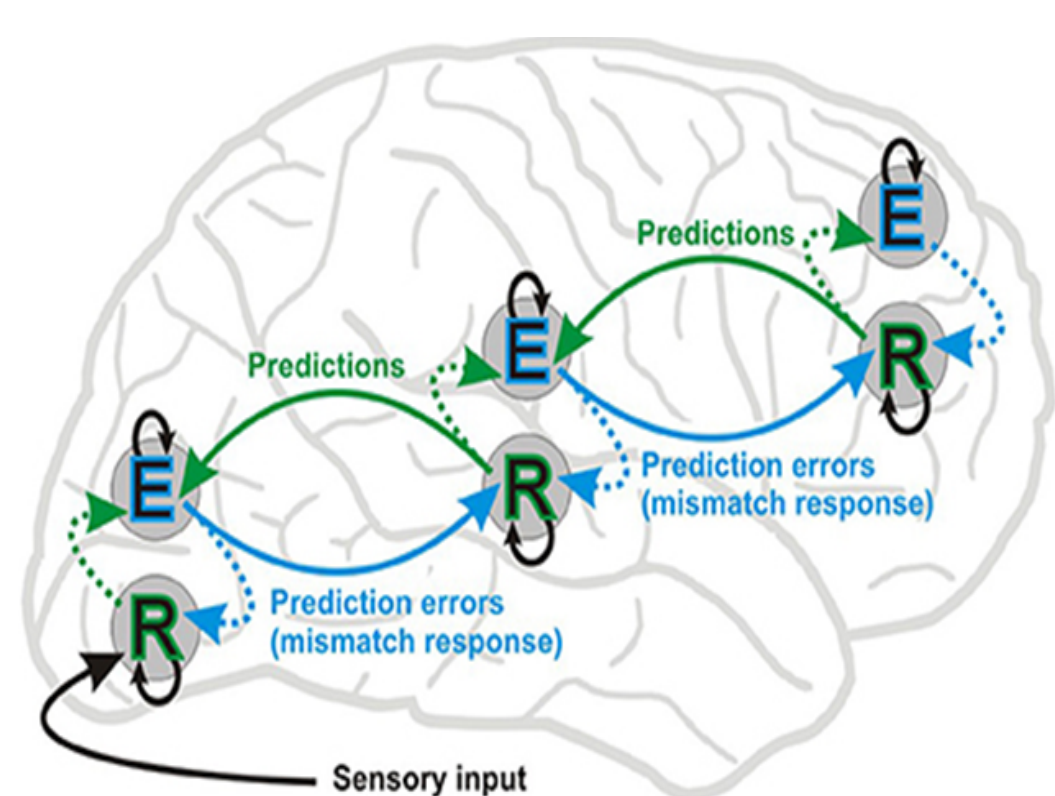
Exp 1



Exp 2: Interleave target types



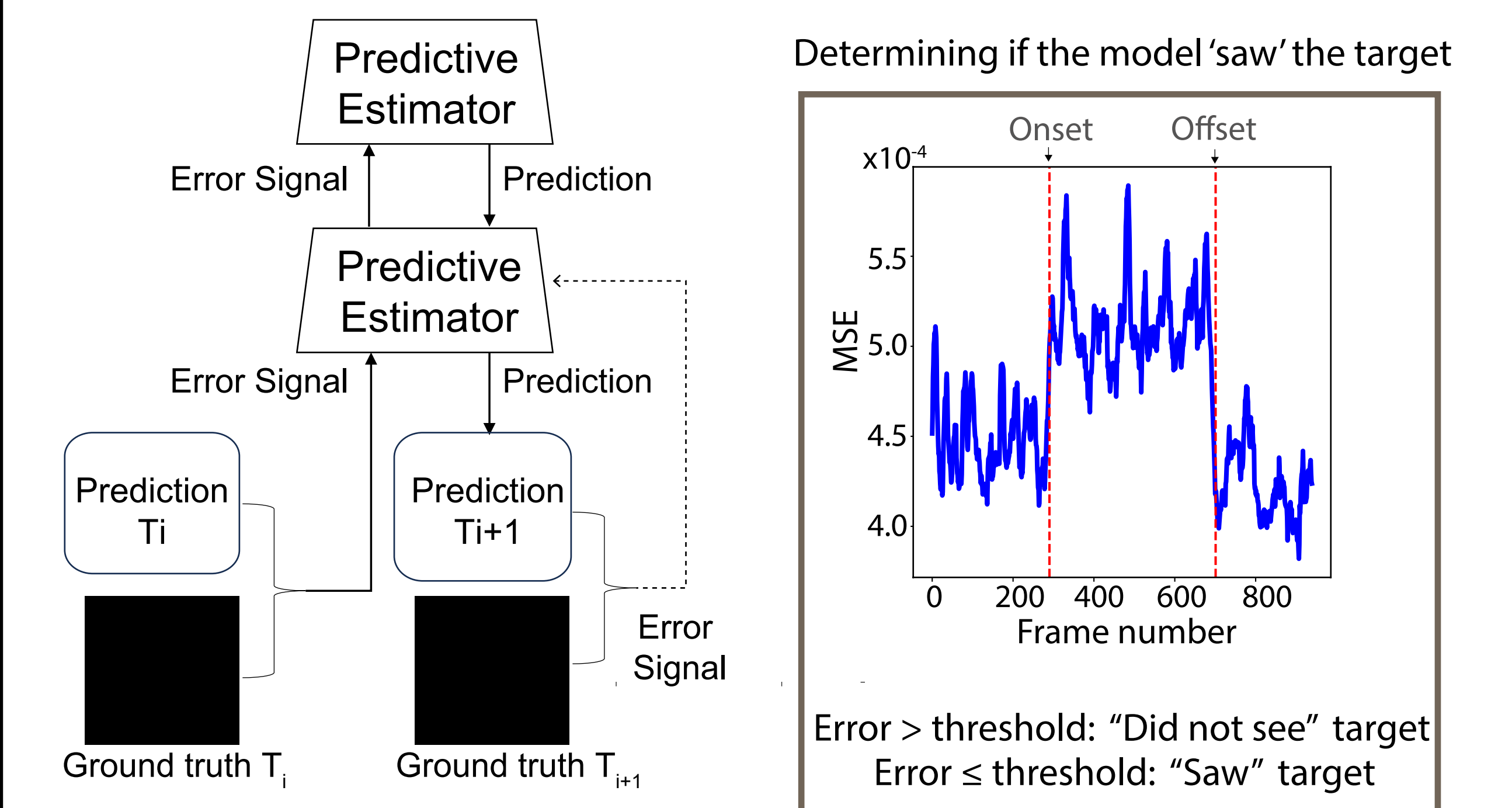
Why?



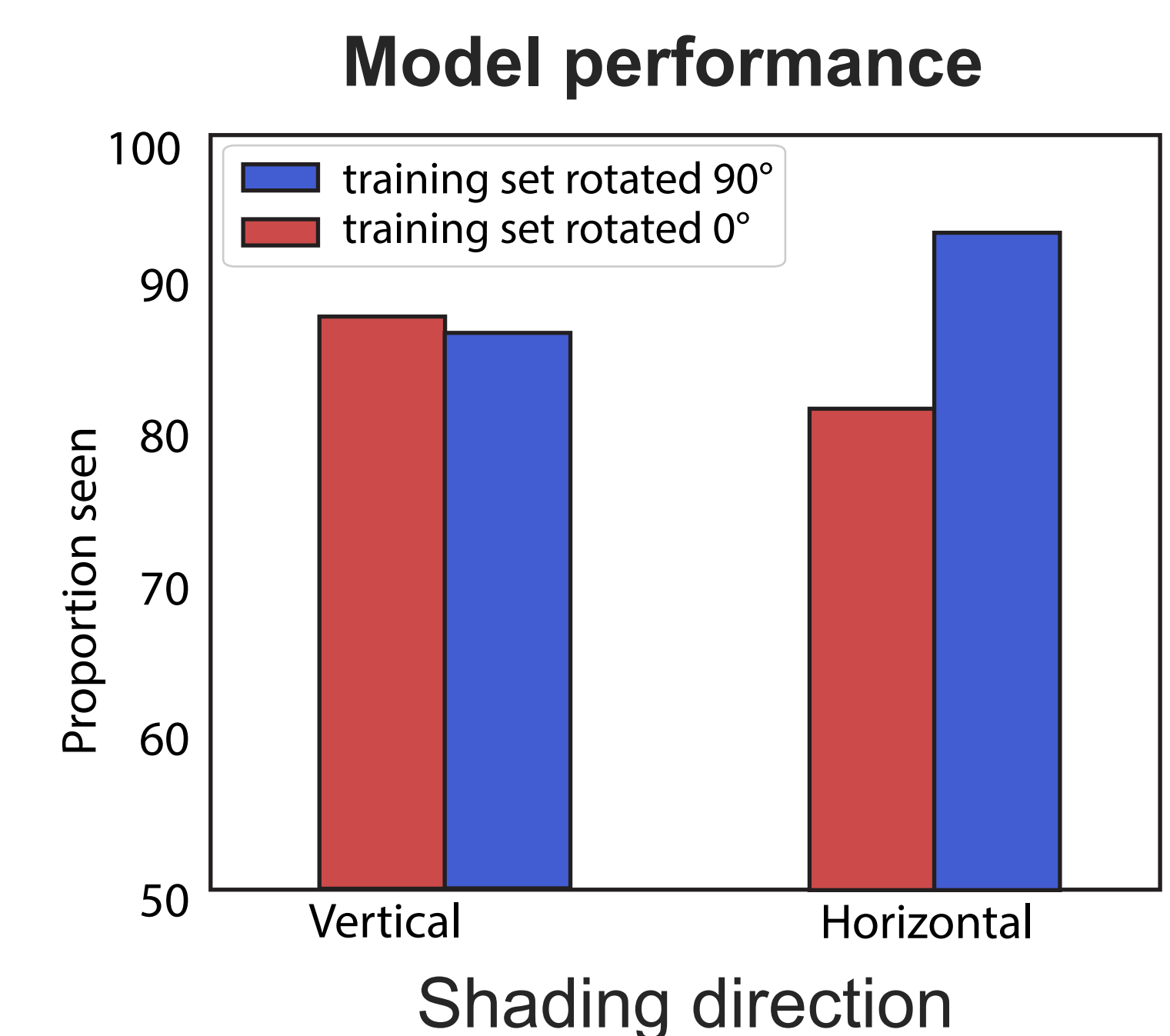
Stefanics et al. (2014)

Take shading direction for example. We tend to experience more vertical changes in lighting in the real world. The ensuing prior may drive the asymmetry.

Computational modeling



- Trained on naturalistic videos that are upright or rotated 90 degrees.
- Tested on our stimulus set.



Conclusion and moving forward...

Visual search asymmetry persists in IAB
Driven by biases derived from prior visual experience, at least for shading direction
We are studying the causes for the other types of asymmetry (e.g., lines vs curves)