

Memory Representations Contain Conceptual and Perceptual Information

Rennie Kendrick¹, Lea Frank^{1,2}, Dasa Zeithamova^{1,2}
¹University of Oregon, ²Department of Psychology

BACKGROUND

Prior work demonstrates that **ventral temporal cortex (VTC)** represents visual features,³ whereas **parietal cortex** represents conceptual features^{1,2} of stimuli

VTC
 Color
 Size



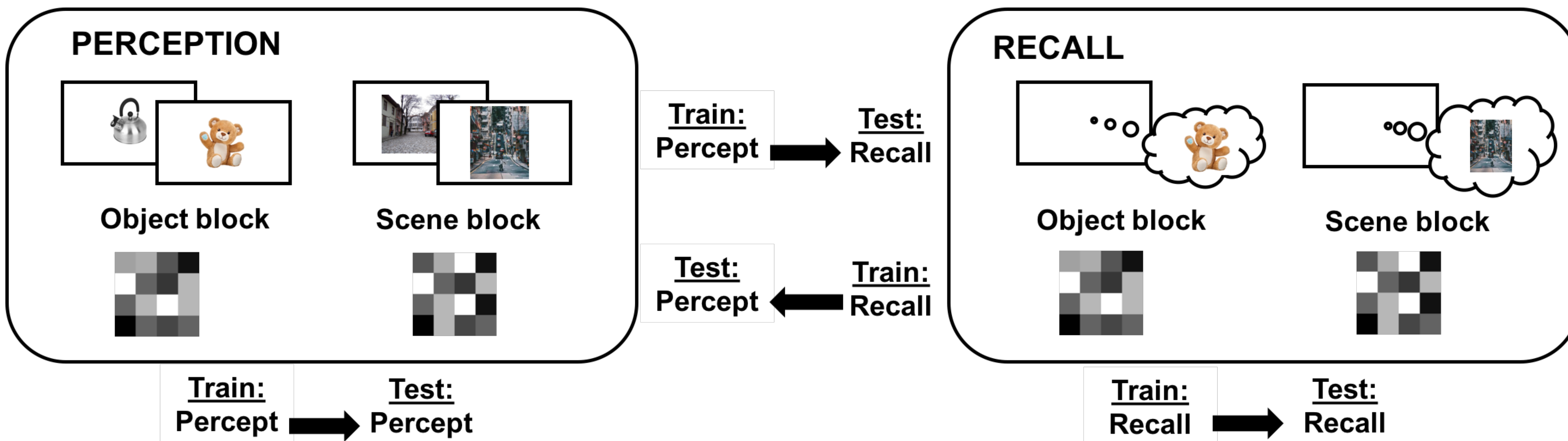
Parietal
 Category (toy)
 Familiarity

RESEARCH QUESTION

Do memory representations contain conceptual or perceptual information?

METHODS

Multi-voxel pattern classifier trained to decode **objects or scenes**

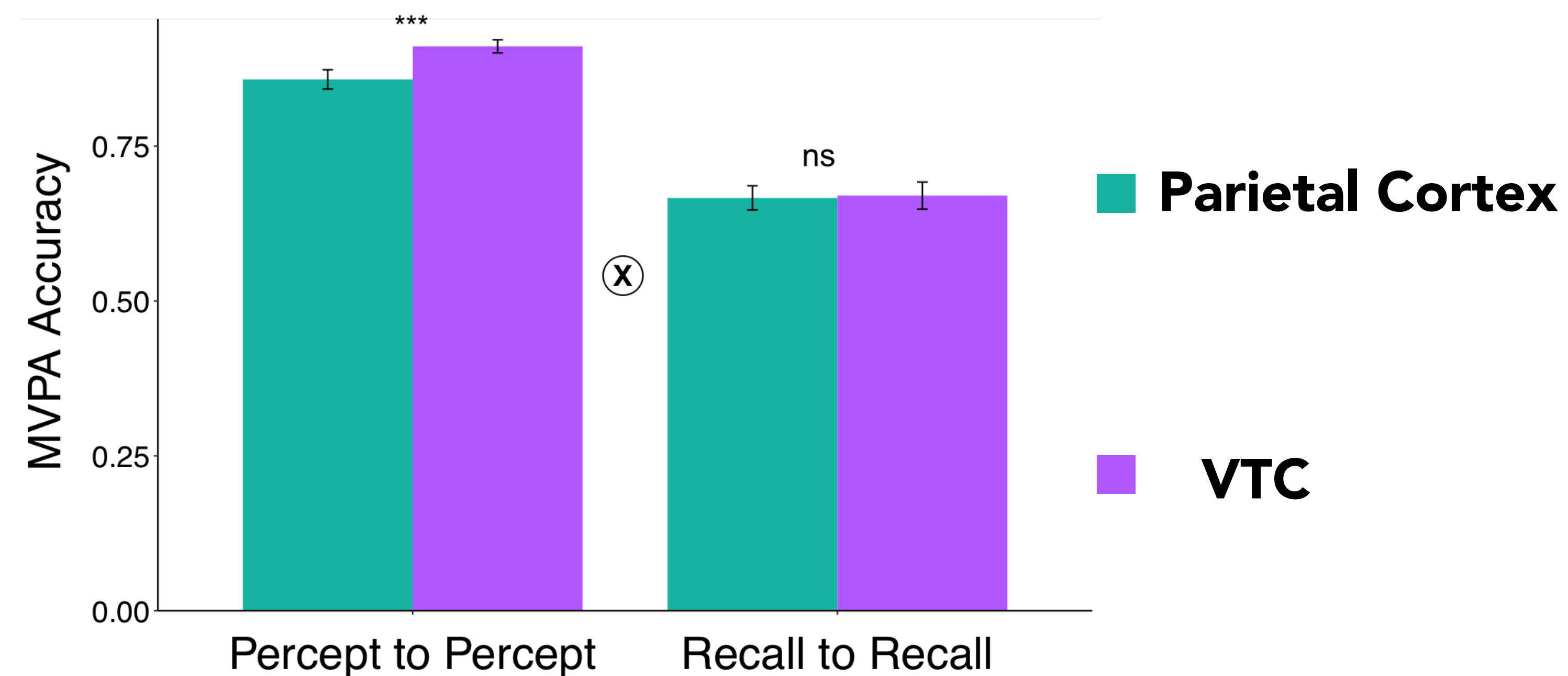


Old/new recognition to link neural representations to memory performance

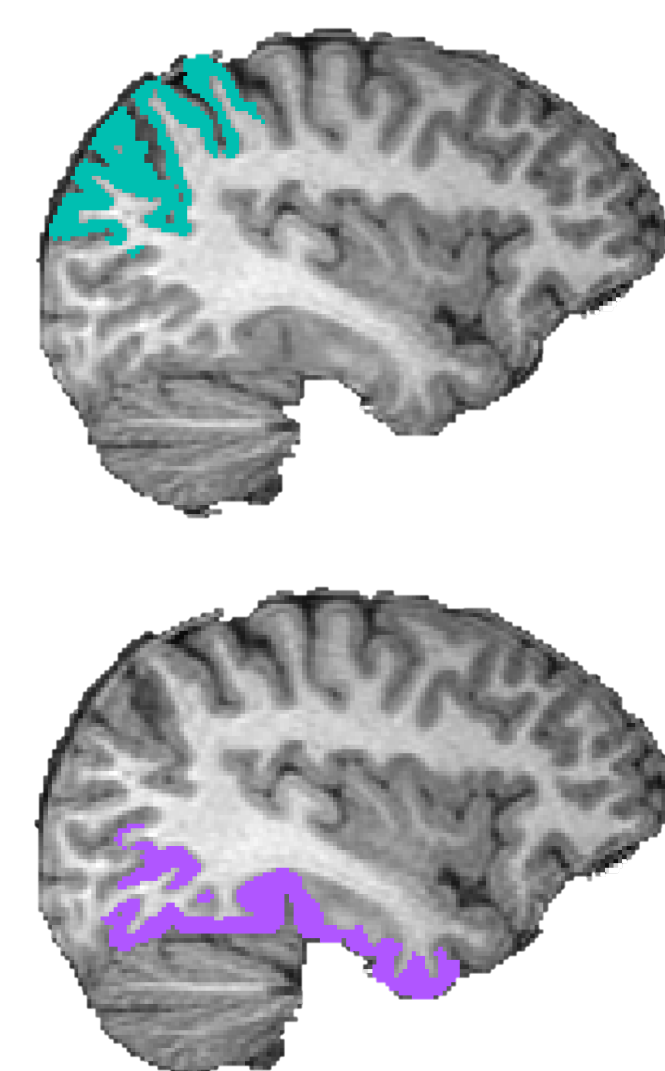
RESULTS

Hypothesis: Perception: VTC > parietal cortex; Recall: Parietal cortex > VTC

Perception vs. Recall



Regions-of-Interest

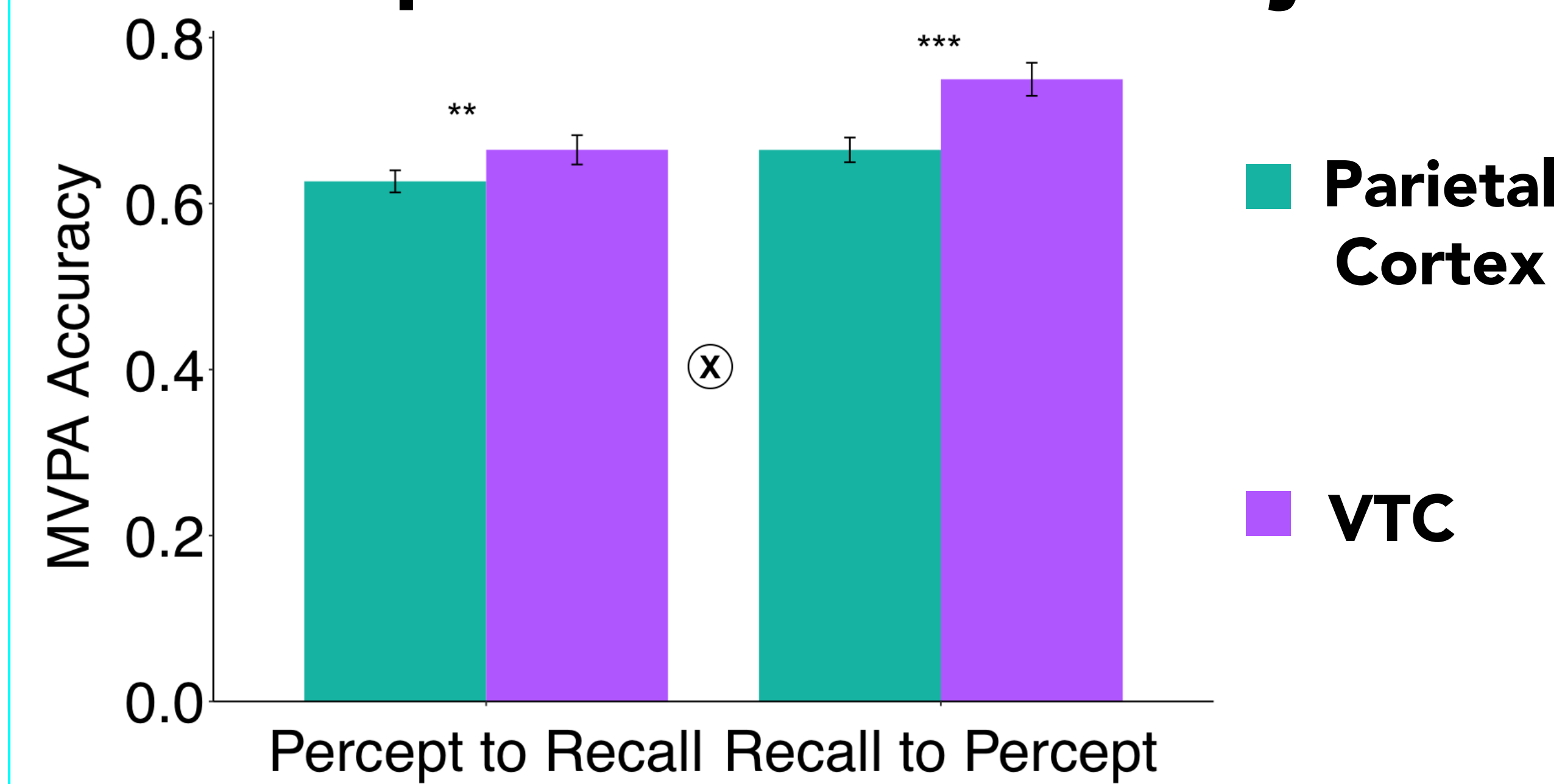


While VTC representations are better decoded at perception than parietal cortex, **VTC no longer has an advantage at recall.**

RESULTS

Hypothesis: Parietal cortex perceptual/recall similarity > VTC

Perception/Recall Similarity

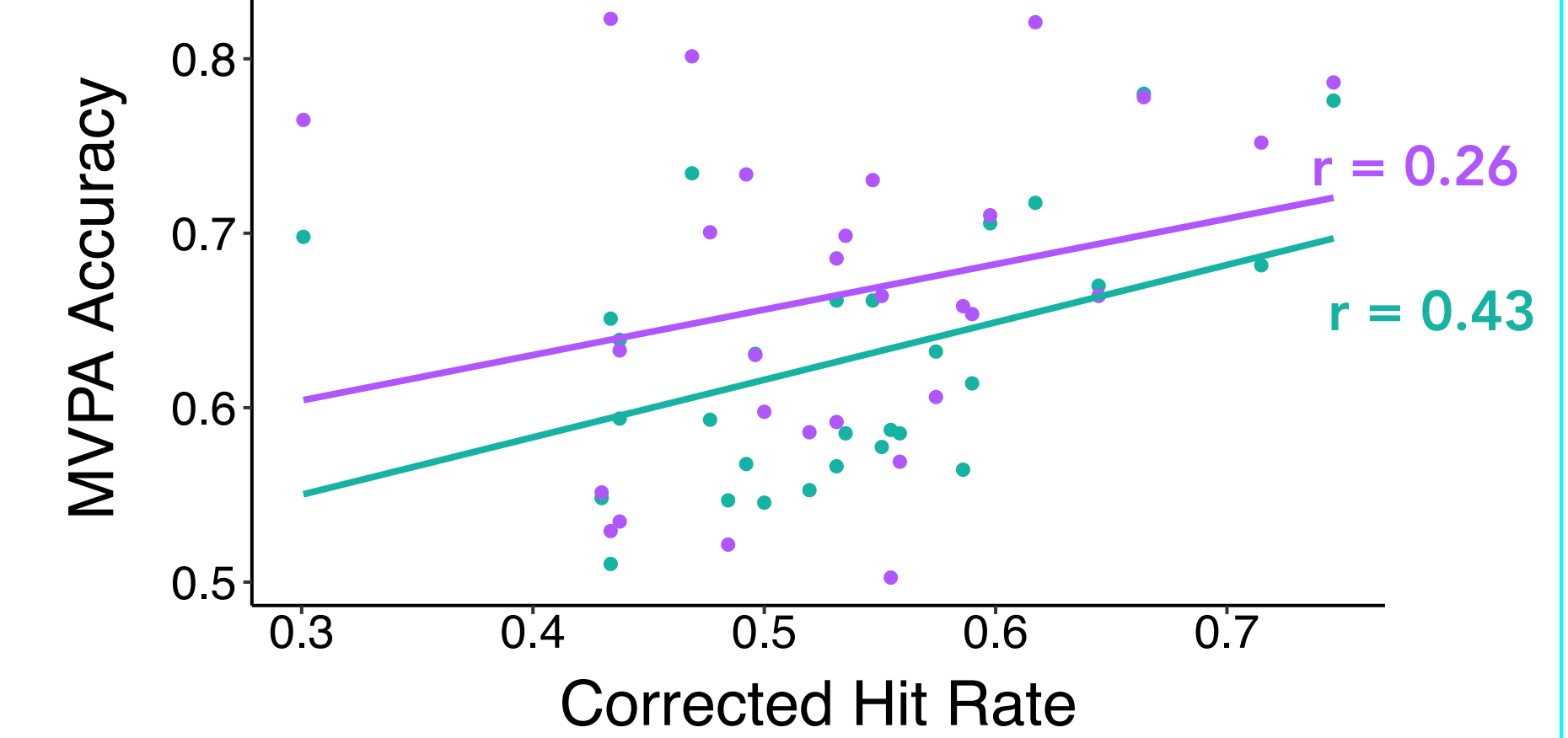


Contrary to our hypothesis, **VTC demonstrated greater perceptual/recall similarity**—some perceptual features are encoded in memory

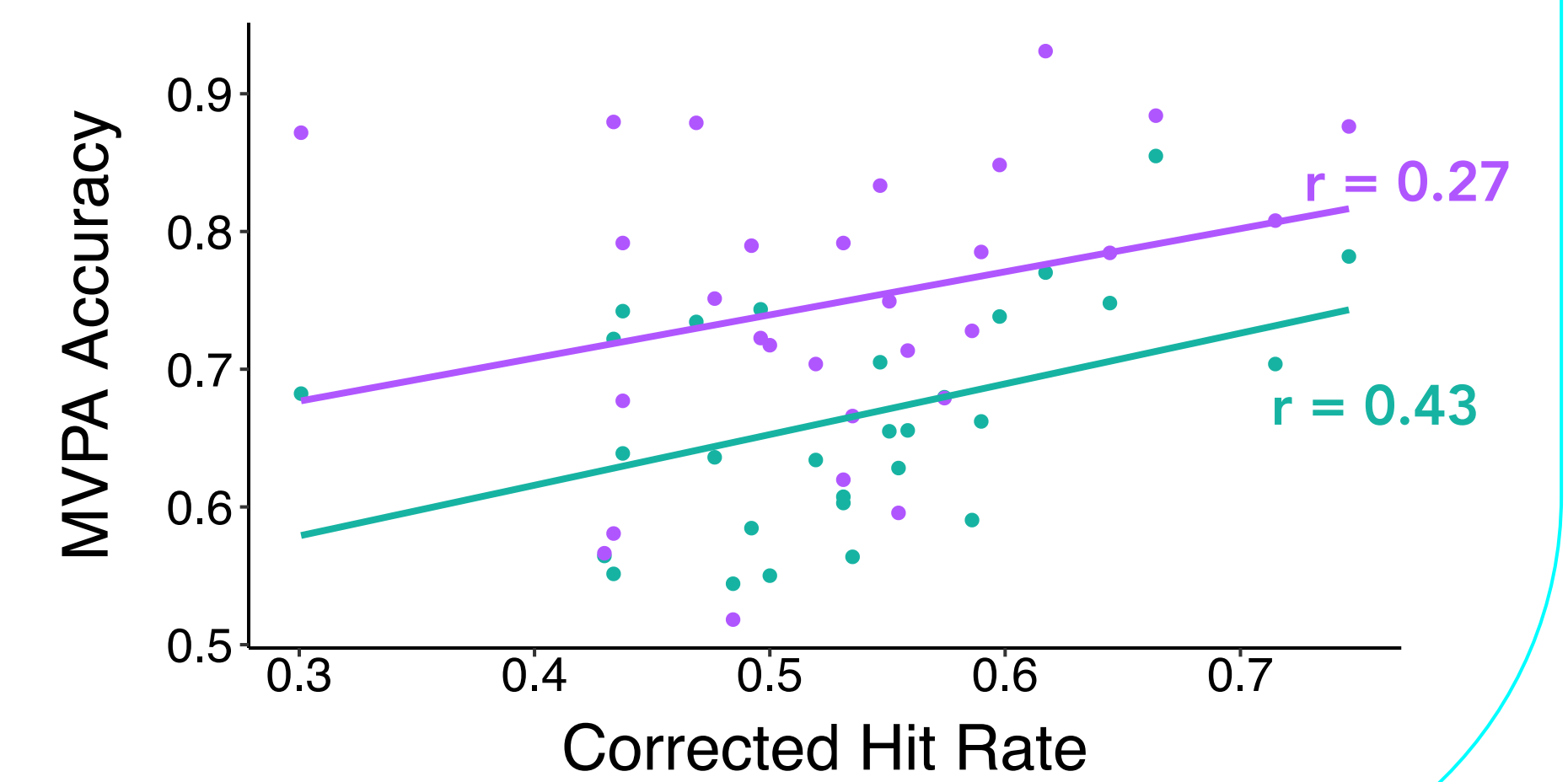
However, the **degree of perceptual/recall similarity in parietal cortex only predicted memory**

Memory Performance

Perception to Recall



Recall to Perception



CONCLUSIONS

Parietal cortex representations were never better decoded than VTC—**reactivated memories include perceptual³ details solely coded in VTC**, in addition to **conceptual features^{4, 5, 6}**

However, the **fidelity of neural representations in parietal cortex only was linked to memory⁷**—reactivation of **conceptual features** most useful for differentiating one stimulus from another

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