

A Source for Feature-Based Attention in the Prefrontal Cortex

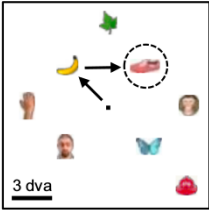
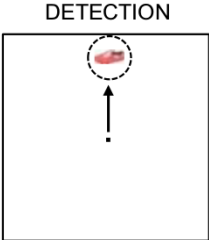
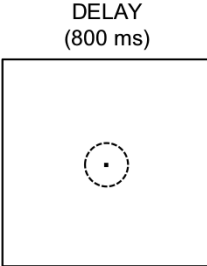
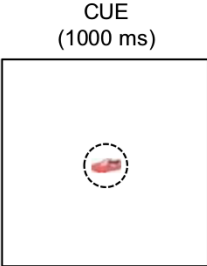
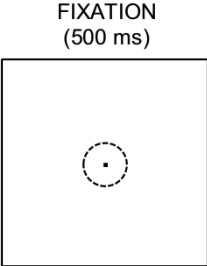
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visual search!



SEARCH

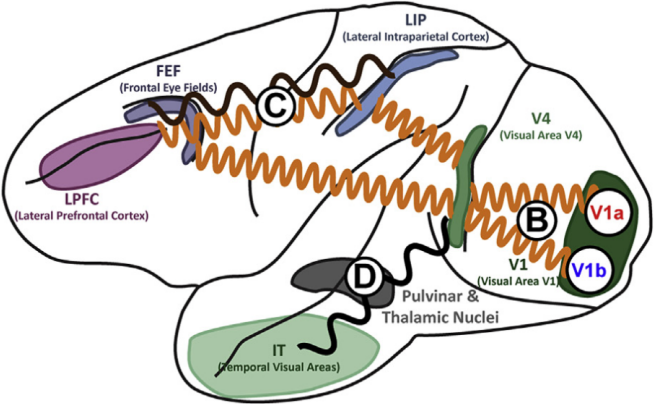
visual search!

- ▶ priority maps, in which responses to a stimulus in a given location in the retinotopic map are scaled according to the similarity of the stimulus to the searched-for target feature
 - ▶ in FEF, LIP, SC
- ▶ could the matching be computed in early visual areas?
- ▶ but onset of feature-based selection occurs earlier in FEF than in V4 (in free-viewing task)
- ▶ human imaging suggests that the computation may be happening in PFC

visual search!

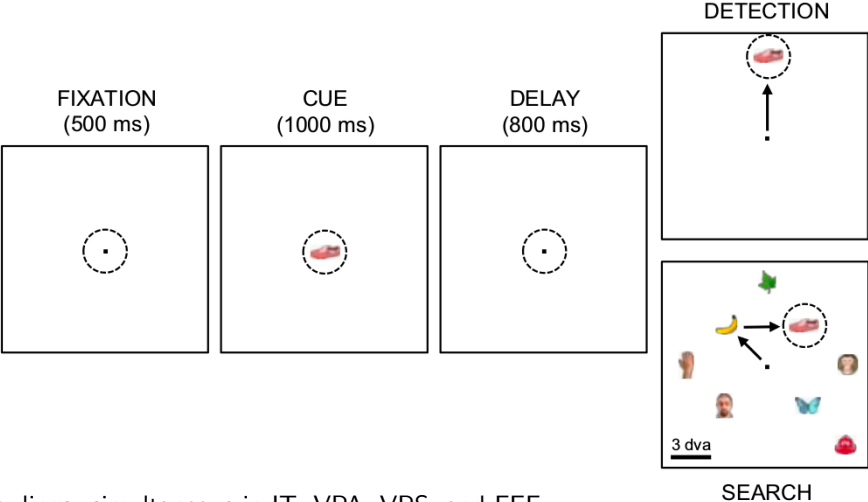
- ▶ **ventral PFC**: connects to IT, TEO, maybe V4, FEF and rest of PFC

A



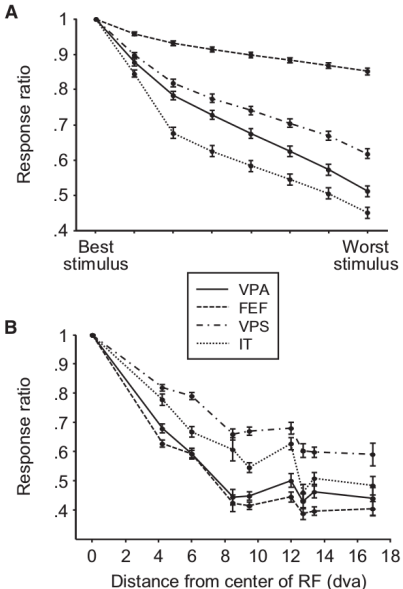
behavioral task

natural images, rewarded for fixating for 800ms continuously

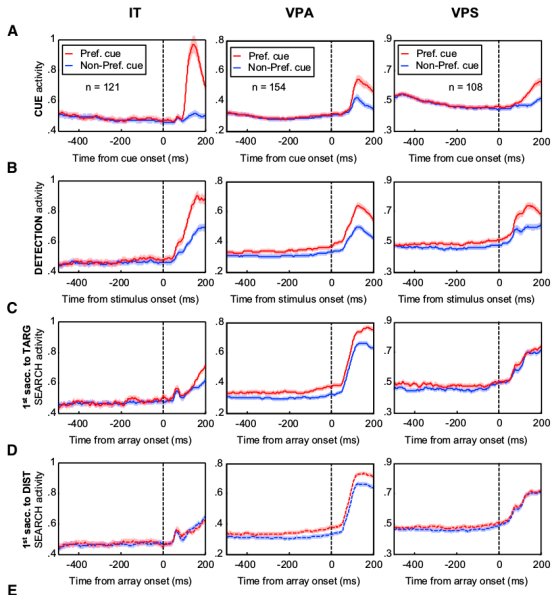


recordings: simultaneous in IT, VPA, VPS, and FEF

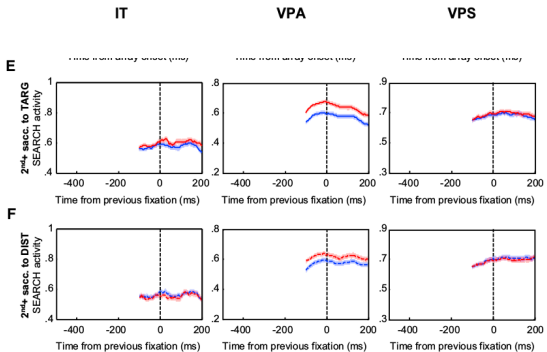
selectivity and spatial tuning



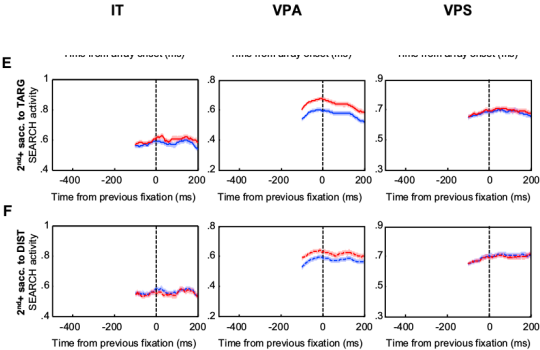
VPA has stimulus selectivity during search



persistent stimulus selective activity in VPA

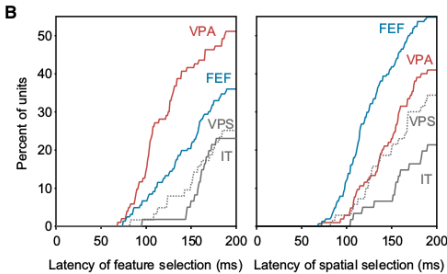
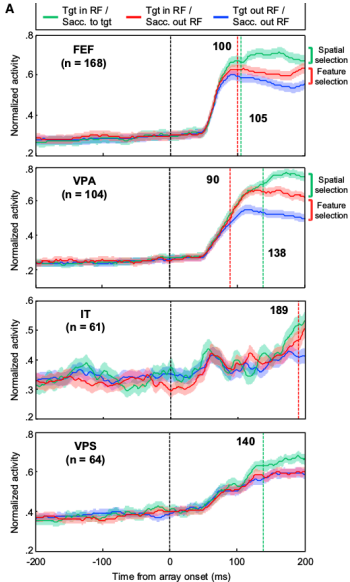


persistent stimulus selective activity in VPA



now want to separate spatial and feature selection

time course of feature-based and spatial attention



magnitude of feature- and spatial-based selection

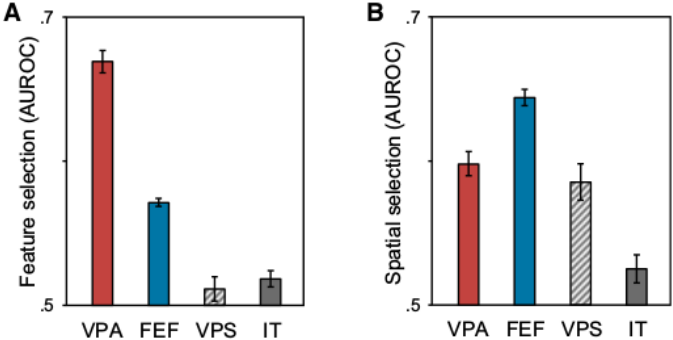
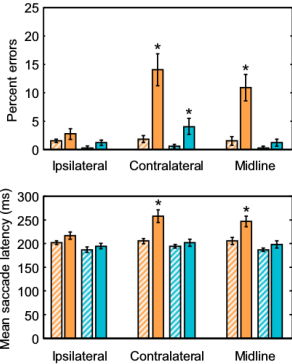
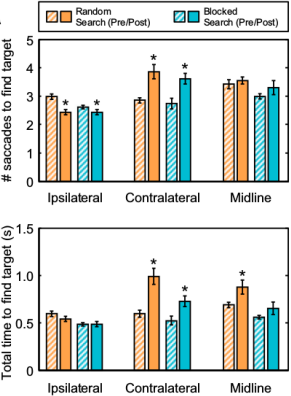


Figure 5. Magnitude of Feature-Based and Spatial-Based Selection

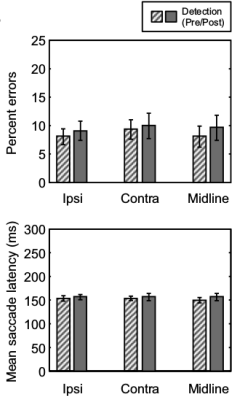
Magnitude of feature-based (A) and spatial-based (B) selection. Error bars represent SEM. The number of units contributing to each area is shown in [Figure 4](#).

inactivation of VPA impairs performance on task

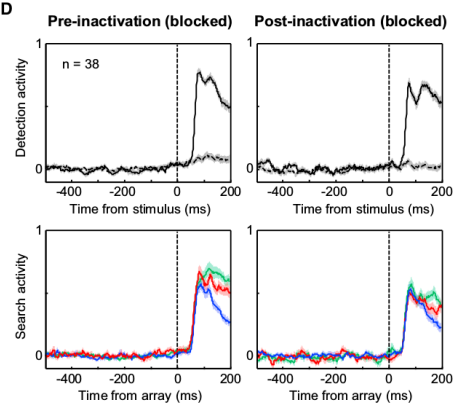
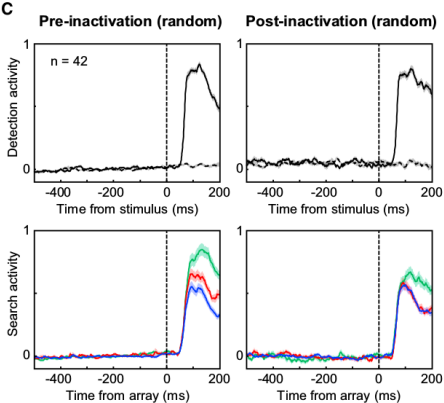
A



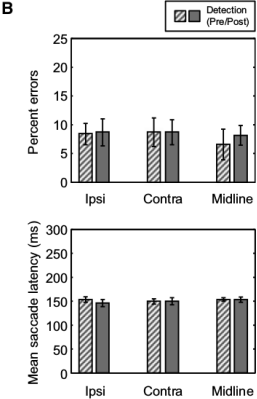
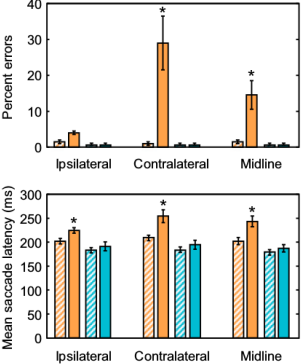
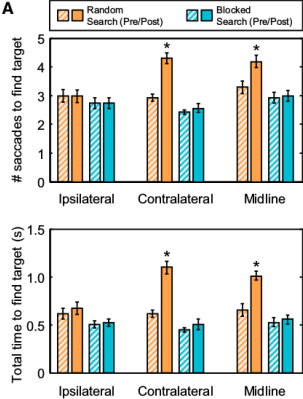
B



inactivation of VPA impairs FEF feature-selectivity



inactivation of VPS impairs random task only



conclusions

- ▶ VPA (PFC) as source of feature-based attention
- ▶ multi-unit activity: unknown whether single cells have these properties
- ▶ necessary for feature-selectivity in FEF