

Occipitotemporal Representations Are Modulated by Conceptual Knowledge and Interact with a Frontoparietal Network

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Presentation Abstract Summary Through selective attention, knowledge of abstract concepts can emphasize informative stimulus features. For example, the size of garments is critical when choosing what to purchase, whereas weight may be more important when deciding how to ship them. In two fMRI studies, we investigated whether neural representations of stimulus features vary according to these latent attentional effects. During scanning, participants categorized stimuli according to strategies that were learned through trial and error. Formal categorization models were fit to the behavioral data from each participant, and provided attentional weight estimates for each binary stimulus dimension. We found that when greater attention was devoted to a particular visual dimension (e.g., color), its value (e.g., red) was more easily decoded from occipitotemporal cortex; indicating that conceptual knowledge can modulate representations of individual perceptual features. To better understand this effect, we conducted a multivariate connectivity analysis, which allowed us to identify regions involved in reading out and/or modulating these visual feature representations. The results suggest that several frontoparietal regions integrate or modulate occipitotemporal stimulus feature representations.

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