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### **The neural correlates of visual distraction during episodic memory retrieval**

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*Abstract:* Filtering information on the basis of what is relevant to accomplish a goal is a critical process underlying higher cognition. It is not yet known whether modulation of irrelevant visual information is also instrumental during retrieval of episodic memory, which is thought to depend upon mental imagery that represents perceptual information about prior experiences. We examined the impact of visual distraction on episodic retrieval by comparing participants' memory for objects, which had been encoded visually, across recollection tests in three conditions: with their eyes shut (SHUT); with their eyes open and gaze fixed at the center of a uniformly gray screen (GRAY); and with their eyes open and gaze fixed at the center of images of natural scenes (VD). During scans with functional magnetic resonance imaging (fMRI), participants gave a response to an auditory cue for each target object (as well as for lures) that indicated recollection for contextual information from the study session. The results show that simply having eyes open diminished participants' recollection performance, as the mean proportion recollected during SHUT was greater than during GRAY or VD, which were not different from each other. Activity in the left hippocampus increased in association with recollection across test conditions, relative to when recollection failed, while activity in the right hippocampus increased only during SHUT recollection. Also in the right hippocampus, activity in association with recognition when recollection failed was reduced during VD, relative to SHUT or GRAY, which were not different from each other. In a region of the left supramarginal gyrus thought to guide top-down attention toward internal representations, activity increased for recognized objects, relative to forgotten objects, yet was differentially greater for VD recollection than VD recognition when recollection failed. These data suggest that visual distraction interferes with top-down selection processes in posterior cortex and disrupts the availability of episodic information to the medial temporal lobes. Connectivity analyses will examine the role of top-down modulation in the suppression of bottom-up influences that result from external distraction and interfere with mental imagery tapped by episodic retrieval.

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