

## Valence Effects on Episodic Memory Retrieval Following Exposure to Arousing Stimuli in Young and Old Adults

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**Abstract :** Episodic memory retrieval benefits from arousal, with better performance linked to arousing to-be-remembered information. However, the enduring impact of arousal on subsequent memory processes, particularly for non-arousing stimuli, remains unclear. This functional Magnetic Resonance Imaging (fMRI) study examined the effects of arousal on episodic memory processes in young and old adults, focusing on memory of neutral information following arousal exposure. Neural activity was assessed at three distinct timepoints: during exposure to arousing and non-arousing stimuli, memory consolidation (with or without arousing stimulus exposure), and during memory retrieval (with or without arousing stimulus exposure). Behavioural results show that across both age groups, participants performed worse when retrieving episodic memories about a video preceded by a highly arousing negative image. Our fMRI findings reveal three key findings: i) the extension of the influence of negative arousal beyond encoding; ii) the presence of this influence in both young and old adults; iii) and the differential treatment of positive arousal between these age groups. Our findings emphasise valence-specific effects on memory processes and support the enduring impact of negative arousal. We further propose an age-related alteration in the old adult brain in differentiating between positive and negative arousal.

**Keywords :** episodic memory, ageing, fmri, arousal, valence

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