

# AGE-DIFFERENCES IN THE NEURAL CORRELATES OF EPISODIC RETRIEVAL DEPEND ON TASK DIFFICULTY

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Numerous studies have demonstrated age-related differences in the neural correlates of episodic memory, older adults exhibiting either less brain activation or greater activation compared to young adults. However, the reasons for these discrepant results are still unknown. In the present study, we used fMRI to investigate the effects of age on the neural correlates of successful episodic retrieval at different levels of task demands. Young and older adults studied pictures that were presented once (hard condition) or twice (easy condition). Then, they were scanned while performing a recognition task. Behavioral performance was similar in both age groups in the easy condition whereas in the hard condition, recognition performance was higher for younger than older adults. Imaging data (event-related analyses, SPM8,  $p < 0.05$  corrected) revealed in both age groups a network of frontal and parietal regions where activity was greater for correctly recognized old items than for correct rejections. In the easy condition, older adults showed reduced activations compared to young adults in the anterior cingulate cortex and in the left inferior frontal region but they recruited additional right frontal areas (inferior, middle, superior). In the hard condition, both age groups recruited bilateral frontal and left parietal regions but only older adults showed significant activations on right parietal areas. These findings suggest that age differences in neural engagement vary with the level of task difficulty. Older adults need to recruit neuronal resources at lower difficulty level than younger adults, leaving less resource for higher difficulty level, and thus leading to performance decrements.

## References

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