

DIMINISHED MEDIAL TEMPORAL LOBE ACTIVATION WITH EXPANDING RETRIEVAL PRACTICE

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The medial temporal lobe (MTL) has been posited to support pattern completion processes that underlie episodic recall from partial cues. A central question is whether the role of MTL declines as the target memory is strengthened or is more readily accessible. Event-related fMRI was conducted to explore whether MTL activation changes with expanding retrieval practice. During encoding, subjects learned category-exemplar pairs (e.g., FRUIT orange), with six exemplars being studied from each category. Following encoding, subjects were scanned while performing category-stem cued recall (e.g., FRUIT or___) on a subset of categories and on a subset of exemplars within a category (Anderson et al., 1995). For retrieval practiced category-exemplar pairs there were three retrieval practice trials, with the temporal structure following an expanding sequence (3.6 intervening items occurred between the first and second retrieval practice, and 6.7 occurred between the second and third retrieval practice). Retrieval practice was followed by a 15-min retention interval, and then subsequent category-stem cued recall was assessed for both practiced and unpracticed category-exemplar pairs. Behavioral data revealed that, relative to pairs not receiving retrieval practice, expanding retrieval practice facilitated subsequent cued recall. Neurally, MTL activation was observed during retrieval practice. Importantly, initial results revealed a pattern of declining MTL engagement across the three retrieval practice trials on a pair, suggesting that demands on MTL computations decline as target declarative traces are strengthened or become more accessible due to recent retrieval. These effects may relate to subsequent memory performance and the degree of retrieval induced forgetting.