

Spatial memory deficits in patients after unilateral selective amygdalohippocampectomy
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The present study investigated the differential involvement of the right and left hippocampus in various aspects of spatial memory. In an object-location memory task, participants had to relocate everyday objects presented at different locations. This task consisted of four conditions: 1) coordinate-positional memory, 2) categorical-positional memory, 3) coordinate object-location binding and 4) categorical object-location binding. A spatial search task was included as a measure of spatial working memory. Twenty-five epilepsy patients who underwent a selective amygdalohippocampectomy (16 patients with a left- and 9 with a right-hemisphere lesion) were included. Responses were measured using a touch-sensitive computer screen. The patients' performance was compared to a group of thirty age- and education-matched healthy controls. The results on the object-location memory task show that the left amygdalohippocampectomy group performed poorly on the ability to bind together object information to coordinate spatial locations. In turn, the right amygdalohippocampectomy group was impaired in coordinate positional memory. No group differences were found on the categorical spatial memory conditions. Also, both patient groups were unimpaired on the spatial search task, indicating that spatial working memory was intact. These findings are in line with the cognitive map theory as proposed by O'Keefe and Nadel (1978), suggesting the right hippocampus is involved in coordinate spatial-memory processing. Furthermore, the findings show that the left hippocampus might act as a "binding device" that integrates multiple contextual features in memory.

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Poster session: Cognition and Behavioral Neuroscience (Friday)