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# Déjà vu in unilateral temporal-lobe epilepsy is associated with selective impairments in familiarity assessment

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## Abstract

In déjà vu, a phenomenological impression of familiarity is experienced with a sense that the current environment or situation should in fact not feel familiar. How can such a paradoxical experience arise? In the present study, we sought to elucidate the mechanisms involved in déjà vu by examining unilateral TLE patients who experience this phenomenon as part of their seizures (TLE+). Specifically, we tested whether these patients show a unique pattern of interictal memory deficits that reflects selective impairments in familiarity assessment, as defined in current dual-process models of recognition memory. Phenomenological reports confirmed that ictal déjà vu experiences reflected feelings of familiarity for the immediate visual environment that were experienced as subjectively inappropriate. In Experiment 1, we employed a Remember-Know paradigm for visual scenes and we observed recognition impairments that were indeed limited to familiarity assessment in TLE+ patients. In Experiment 2, we administered an exclusion task for visual scenes in which both recognition processes were placed in opposition. TLE+ patients again displayed recognition impairments - but these impairments spared their ability to counteract familiarity with recollection of contextual detail. The selective pattern of deficits in TLE+ patients contrasted with the pattern we observed in our control group of TLE patients without déjà vu (TLE-), whose deficits encompassed familiarity as well as recollection. Notably, the pattern of behaviour across patient groups paralleled differences in structural integrity of the medial temporal lobes, with significantly smaller and hints of more focal volume reductions in the affected hemisphere of TLE+ patients.

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