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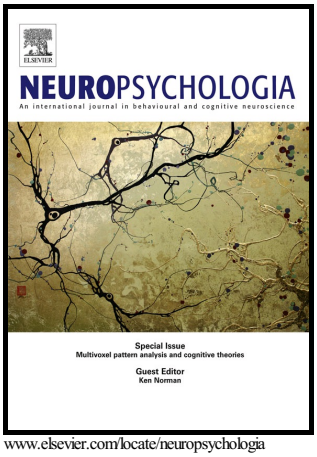

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Gamma phase-synchrony in autobiographical memory: Evidence from Magnetoencephalography and Severely Deficient Autobiographical Memory

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ABSTRACT

The subjective sense of recollecting events from one's past is an essential feature of episodic memory, but the neural mechanisms supporting this capacity are poorly understood. We examined the role of large-scale patterns of neural synchrony using whole-head MEG recordings in healthy adults and S.M., who has severely deficient autobiographical memory (SDAM; Palombo et al., 2015), a syndrome in which autobiographical recollection is absent but other functions (including other mnemonic functions), are normal. MEG was conducted while participants listened to prospectively collected recordings documenting unique personal episodes (PE) that normally evoke rich recollection, as well as a condition including general semantic information that is non-specific in place or time (GS; Levine et al., 2004). We predicted that PE (and not GS) would be associated with changes in patterns of large-scale neural synchrony in comparison subjects. We found large-scale neural synchrony, specifically in the gamma frequency ranges (i.e., 27-45 Hz), specific to PE and not GS. These synchrony differences between PE and GS were not apparent in S.M. Our findings provide empirical evidence for the supporting role of large-scale gamma neural synchrony underlying autobiographical recollection.

1. INTRODUCTION