Stability and change over two years of time: ERP and behavioral correlates of memory retrieval

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Introduction

The development of episodic memory retrieval in children is far from understood, as comparable behavioral performance can be based on distinct cognitive processes. Developmental progress based on the maturation of critical brain structures or on the gradual use of adult-like retrieval strategies results in larger variability in the cognitive processes underlying task performance in developmental populations, either between or within individuals. Hence, less consistent cognitive processes are presumably associated with smaller and less robust electrophysiological correlates.

Study Design and Participants:

ERP and behavioral data during episodic memory and cognitive control paradigms, plus selected neuropsychological tests (t1 plus 2-year follow-up).

Young children
7 – 8 years in grade 2 (n = 20) and grade 4 (n = 19)

Older children
9 – 11 years in grade 5 (n = 20) and grade 7 (n = 17)

Young adults
20 – 23 years in college (n = 18) / 20 – 25 years (n = 25)

Episodic Memory Paradigm

Between t1 and t2, individual waveforms were relatively stable, but differences in the timing and size of ERP components were evident within and between age groups, questioning standard analysis approaches. Hence, principal component analyses (PCAs) were used to guide the selection of time-windows between age groups and time points, validating previously known components as well as identifying potentially relevant new ERP components.

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