Discovering Event Structure in Continuous Narrative Perception and Memory

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Presentation Abstract Summary During realistic, continuous perception, humans automatically segment experiences into discrete events. Using a novel model of cortical event dynamics, we investigate how cortical structures generate event representations during narrative perception, and how these events are stored to and retrieved from memory. Our data-driven approach allows us to detect event boundaries as shifts between stable patterns of brain activity without relying on stimulus annotations, and reveals a nested hierarchy from short events in sensory regions to long events in high-order areas (including angular gyrus and posterior medial cortex), which represent abstract, multimodal situation models. High-order event boundaries are coupled to increases in hippocampal activity, which predict pattern reinstatement during later free recall. These areas also show evidence of anticipatory reinstatement as subjects listen to a familiar narrative. Based on these results, we propose that brain activity is naturally structured into nested events, which form the basis of long-term memory representations.

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