Event Memory from Psychology

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Last Year's Pursuit: starting to become successful?!

- Complimentary Learning Systems (McClelland, McNaughton, O'Reilly 1995)
  - Hippocampus has rapid pattern-separation while cortex has slow learning rate for overlapping representation.
- Event Segmentation Theory (Zacks 2007)
  - Events are themselves recognized and delineated and perception of event boundaries creates episodes.
- Hippocampal Indexing Theory (Teyler & DiScenna 1986)
  - Neocortical activity is stored and indexed by the hippocampus, which can provide replay by re-instantiating those signals.
- Two-State Memory Processing Theory (Buzsáki 1996)
  - The hippocampus transfers memories to the cortex during sleep.

Outline

What is Event Cognition?

"By event we mean a segment of time at a given location that is conceived by an observer to have a beginning and an end. In particular we focus on the events that make up everyday life on the timescale of a few seconds to tens of minutes things like opening an envelope, pouring coffee into a cup, changing the diaper of a baby or calling a friend on the phone."[1]

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- Event is typically specified as the dynamics for some subset of objects and relations within a given context (usually a location).
- Event Cognition is the scientific characterization of the human memory and cognition for time intervals perceived as segments with distinct beginning and end boundaries.

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Event Cognition as a big field of research

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- The real-time perception of events.

Event Cognition as a big field of research

- Types of thinking enabled by thoughts being structured into event representations.
- The real-time perception of events.
- The organization of long-term memories by event-like segments, details of retrieval and encoding.

Event Memory in Humans

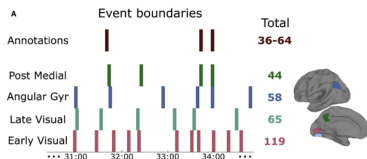# "Events" describe neural activity patterns[2,3]

throughout the brain

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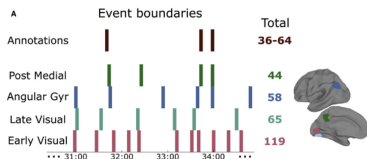# "Events" describe neural activity patterns[2,3]

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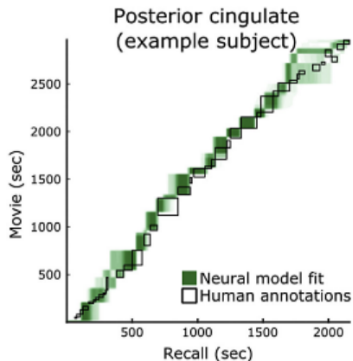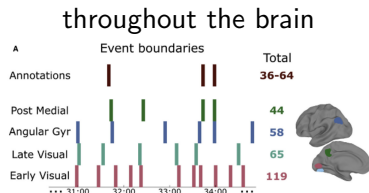throughout the brain

Posterior cingulate
(example subject)

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  - How people move their eyes depends on event boundaries.
- Planning and Simulation[6]
  - Event models are the models for model-based control.

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Event Memory for Cognition

Event Memory describes Working Memory and Long-term Memory

Event Schema (General "Script")   Event Model (Specific grounding)

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Event Model (Specific grounding)

- actually using a light switch
- describing Brutus in Julius Caesar (spoiler)

Event Memory describes representations that generalize across knowledge content

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Representation:

- "event memory element"
  - The type of memory element used to make a model of a specific event
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- prediction and goal addressable
  (not necessarily addressable based on conceptual similarity)

Event Model Knowledge Content

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Cognitive capabilities by Event Model Knowledge Content

	Past	Present	Future	nonspecific
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- Memory
  - Humans reconstruct the past with event structure.

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- unclear that we want to compute in Soar the things humans compute to achieve event memory functionality