Temporal (a)symmetries in cued recall of naturalistic events

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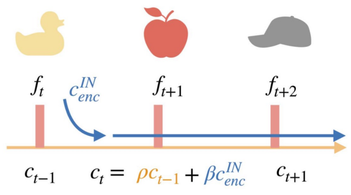
Sketchpad Series

Introduction

- Episodic memory retrieval involves the reinstalment of temporal context, which could facilitate retrieval of nearby events (Manning, 2024)
- Temporal context model suggests the temporal context reinstatement is a combination of pre-experimental context (forward asymmetric) and learned context (symmetric), resulting in the forward asymmetry in free recall (Howard & Kahana, 2002).

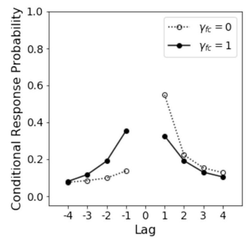
A



c^{IN}_{enc} : Only associate with items after

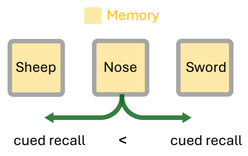
c_{t-1} : Associate with items both before and after

B

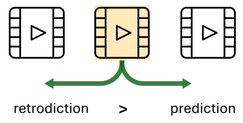


$$c^{IN}_{rec} = (1 - \gamma_{FC})\, c^{IN}_{enc} + \gamma_{FC}\, c_{t-1}$$

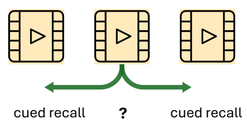
Forward asymmetry in cued recall of word lists (Kahana & Caplan, 2002)



Backward asymmetry in inferring unobserved past events and future naturalistic events (Xu et al., 2024)



Here, we test temporal (a)symmetries in cued recall of naturalistic events

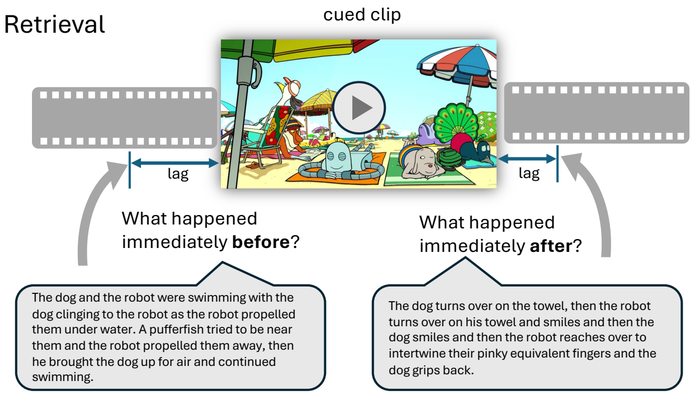


Methods

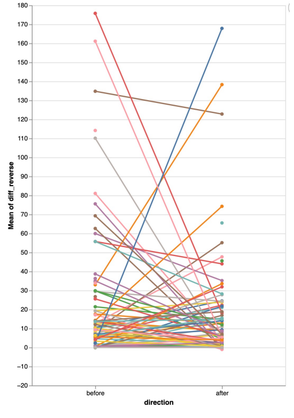
Encoding

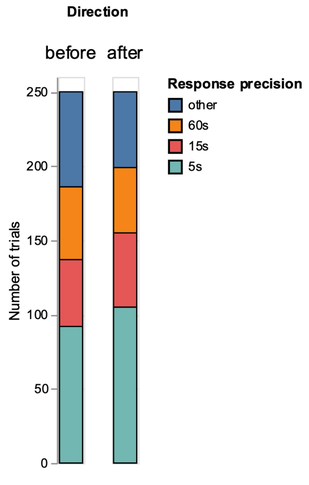
Three 30-min-long segments from each movie

Retrieval

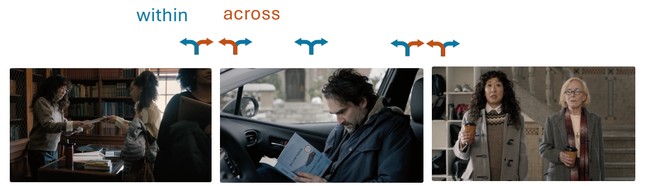


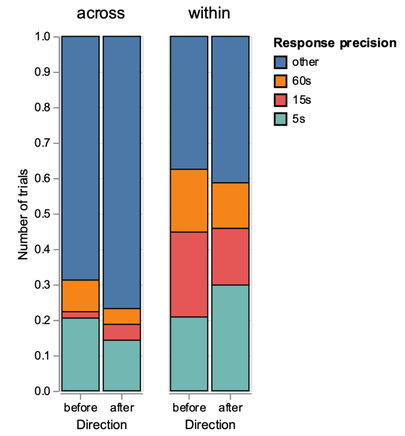
Results





- Event boundaries break temporal associations in memory (Ezzyat & Davachi 2011; Horner et al. 2016; Davis et al., 2021)





Next steps

- Collect a full sample of data
- Annotate responses with LLMs
- Build computational models of memory search and explain the temporal (a)symmetries

References

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