Semantic associations modulate episodic encoding signals and subsequent recognition memory

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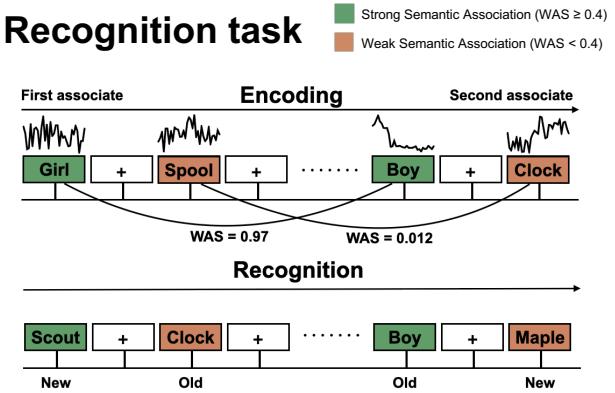
Introduction

- Semantically associated stimuli may act as "reminders" (Greene, 1989; Hintzman, 2011)
- What are the consequences of reminding on later memory?
- What are the neural mechanisms of reminding?

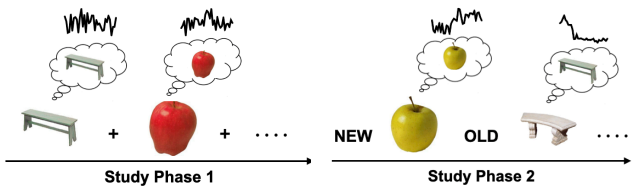
Hypothesis

Reminding reduces distinctiveness leading to worse memory discrimination
Semantic associations induce a retrieval state

Recognition task



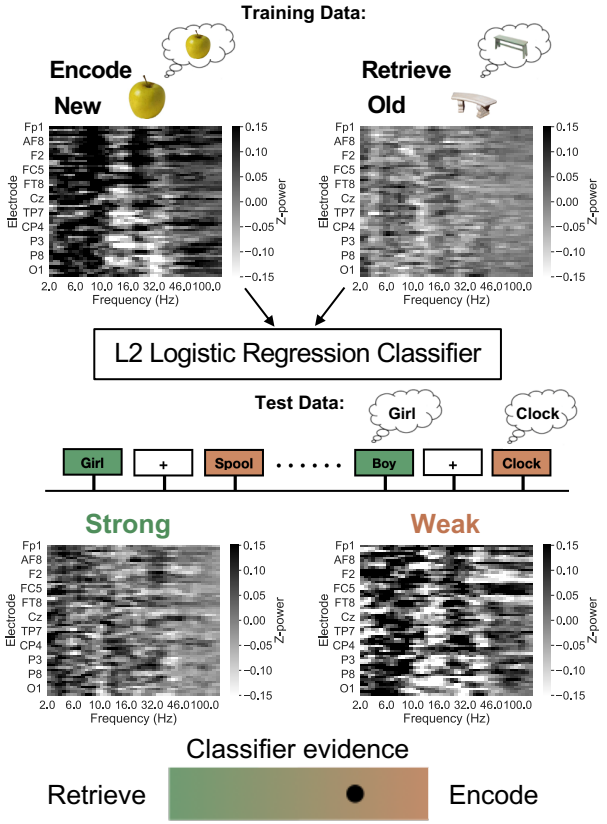
Mnemonic state task



63 electrodes | 46 frequencies
Recognition: 16 trials/run, 12 runs | Encoding: 2s/word | Recognition: self-paced
Mnemonic: 2 phases/run, 8 runs | Phase 1: 2s/obj | Phase 2: 2s/cue + 2s/obj

Multivariate pattern analysis

Classifier trained on mnemonic state task and tested on encoding phase of recognition task



References

Hintzman DL. Research Strategy in the Study of Memory: Fads, Fallacies, and the Search for the "Coordinates of Truth." Perspect *Psychol Sci*. 2011;6(3):253-271.

Greene, R. L. (1989). Spacing effects in memory: Evidence for a two-process account. *JEP:LMC, 15*(3), 371–377.

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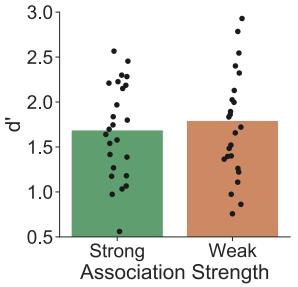
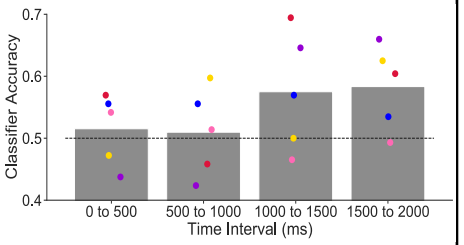
Memory Discrimination



Discrimination is greater for weakly compared to strongly associated words (p = 0.13)

N = 25

Mnemonic state classification



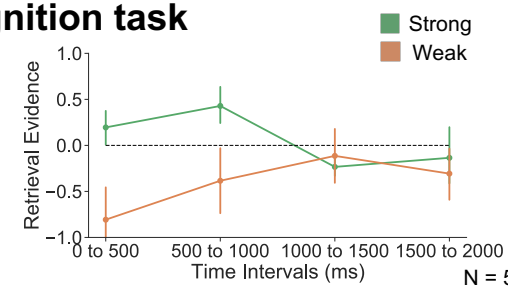
Classification performance varies across time and subjects

N = 5

Retrieval state evidence during encoding phase of recognition task

Using first associate retrieval evidence as a baseline, we calculated retrieval evidence separately for strong and weak second associates

More retrieval evidence for strong semantic associates



N = 5

Summary

Worse discrimination and more retrieval evidence for strongly compared to weakly semantically associated words

Future Directions

Directly connect the increase in retrieval evidence to the decrease in discriminative memory performance

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