

Introduction

- Healthy older adults typically have impaired episodic memory but intact semantic memory (Wingfield & Kahana, 2002)
- Healthy older adults have difficulty inhibiting the retrieval of semantic knowledge (Wynn et al., 2020)
- Memory encoding and retrieval brain states can be decoded from whole-brain activity patterns (Long & Kuhl, 2019; Smith, Moore & Long, 2022)
- Retrieving the past comes at the expense of encoding the present (Long & Kuhl, 2019)

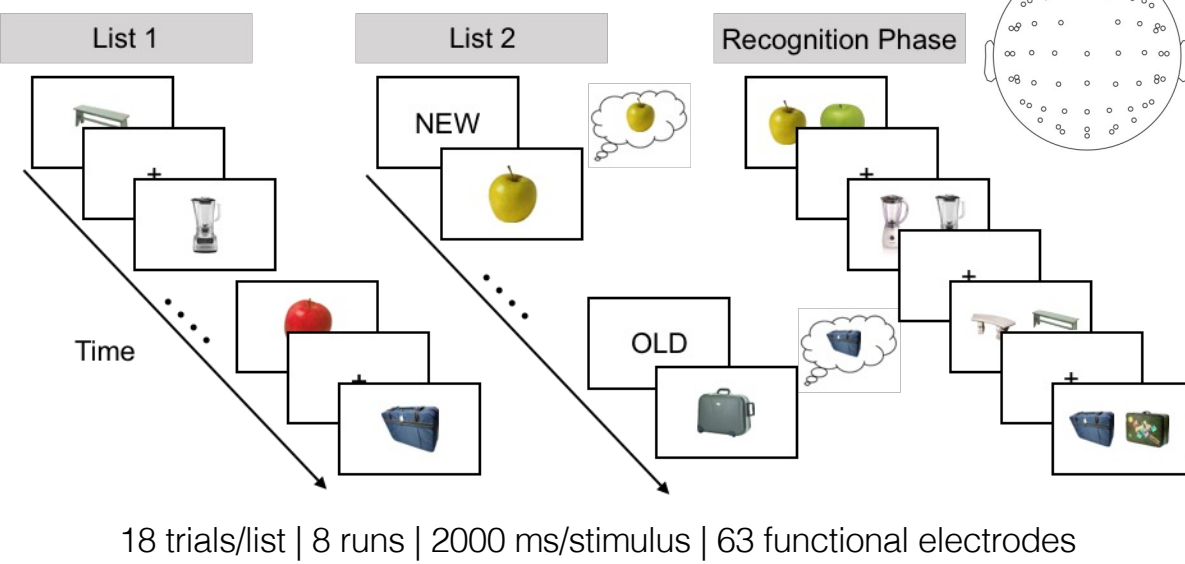
Hypothesis

- Older adults retrieve semantic information at the expense of encoding, leading to diminished episodic memory

Participants

- Older adults: 60-85 years old, N = 38
- Middle-aged adults, 36-59 years old, N = 20[†]
- Young adults: 18-35 years old, N = 36

Mnemonic state task



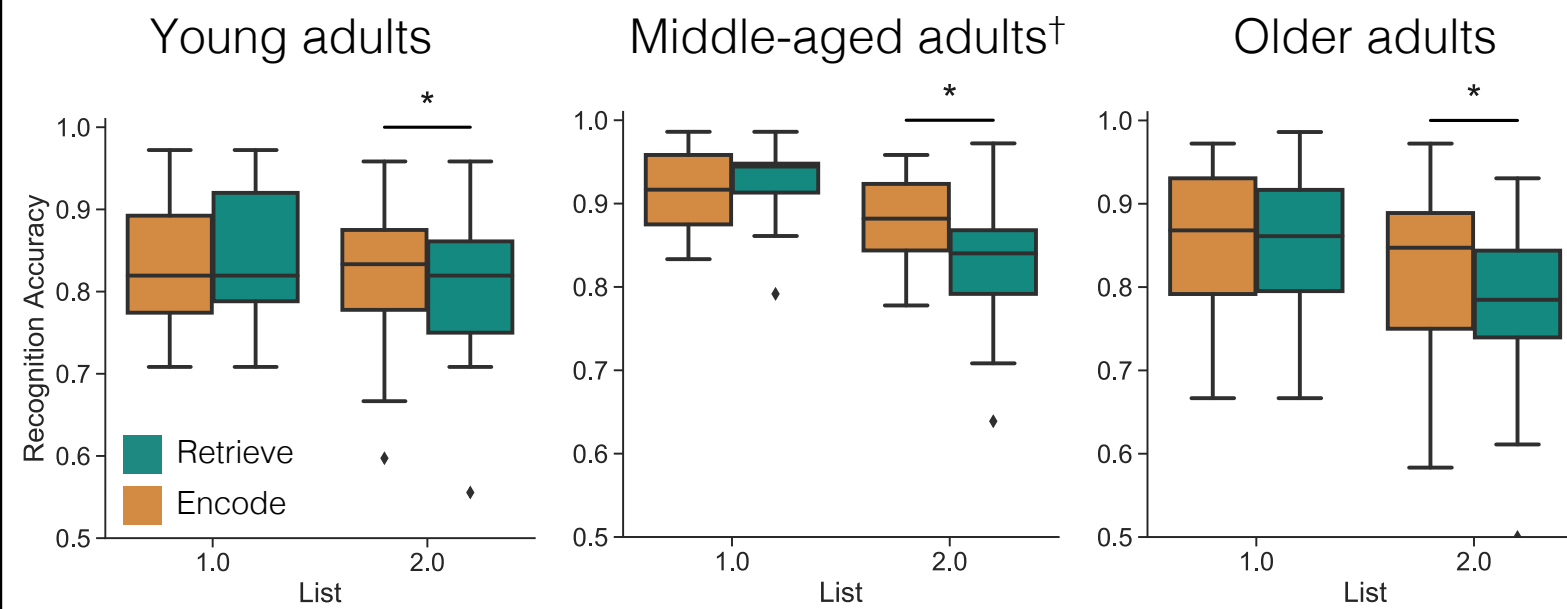
References

- Long, N.M. & Kuhl, B.A. (2019). Decoding the tradeoff between encoding and retrieval to predict memory for overlapping events. *NeuroImage*, 201.
- Smith, D.E., Moore, I.L. & Long, N.M. (2022). Temporal context modulates encoding and retrieval of overlapping events. *Journal of Neuroscience*, 42(14), 3000-3010.
- Wingfield, A. and Kahana, M.J. (2002). The Dynamics of Memory Retrieval in Older Adulthood. *Canadian Journal of Experimental Psychology*, 56(3), 187-199.
- Wynn, J., Ryan, J.D. & Moscovitch, M. (2020). Effects of Prior Knowledge on Active Vision and Memory in Young and Older Adults. *Journal of Experimental Psychology: General*, 149(3), 518-529.

Acknowledgements

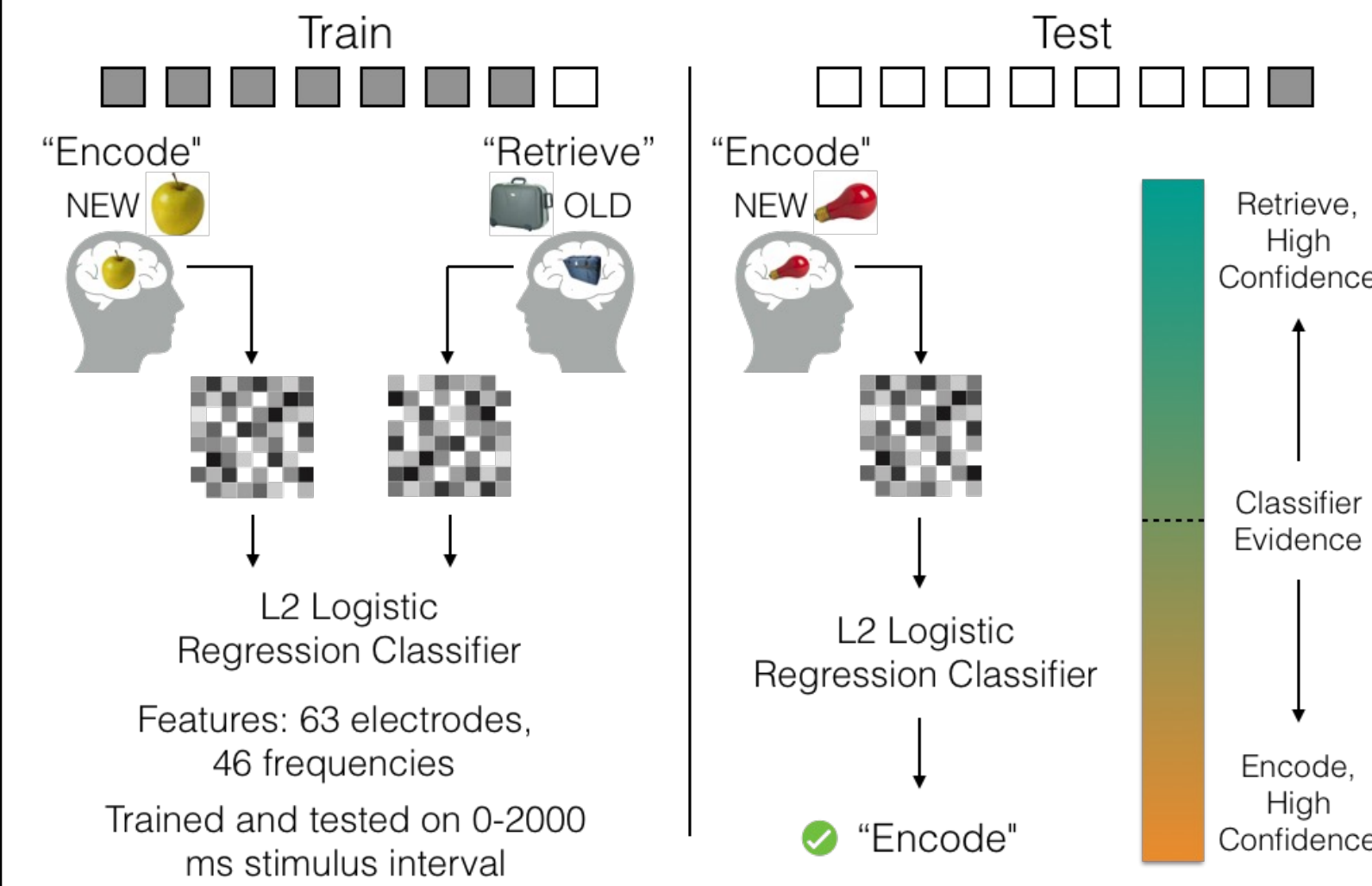
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Behavioral evidence of memory state shifts

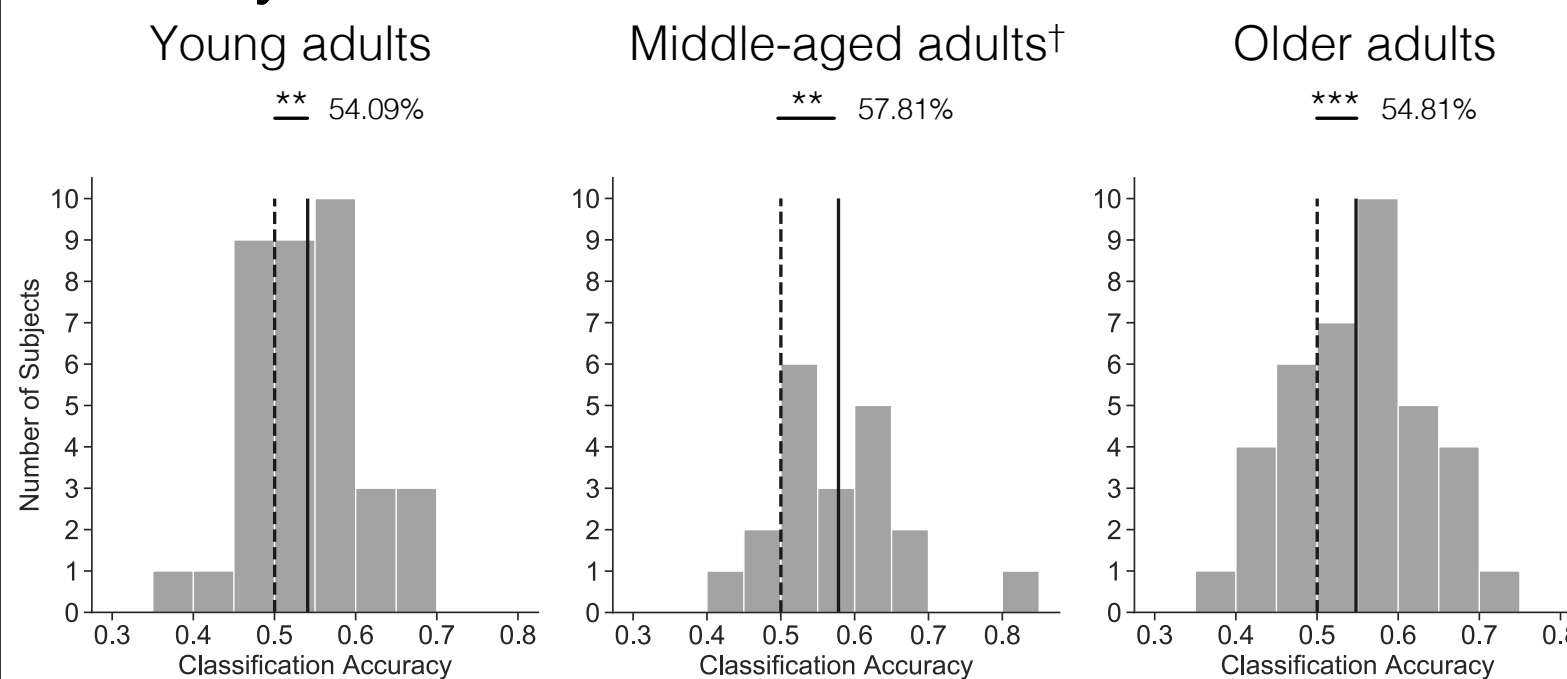


Better memory for List 2 Encode than List 2 Retrieve across age groups

Multivariate pattern analysis (MVPA) approach



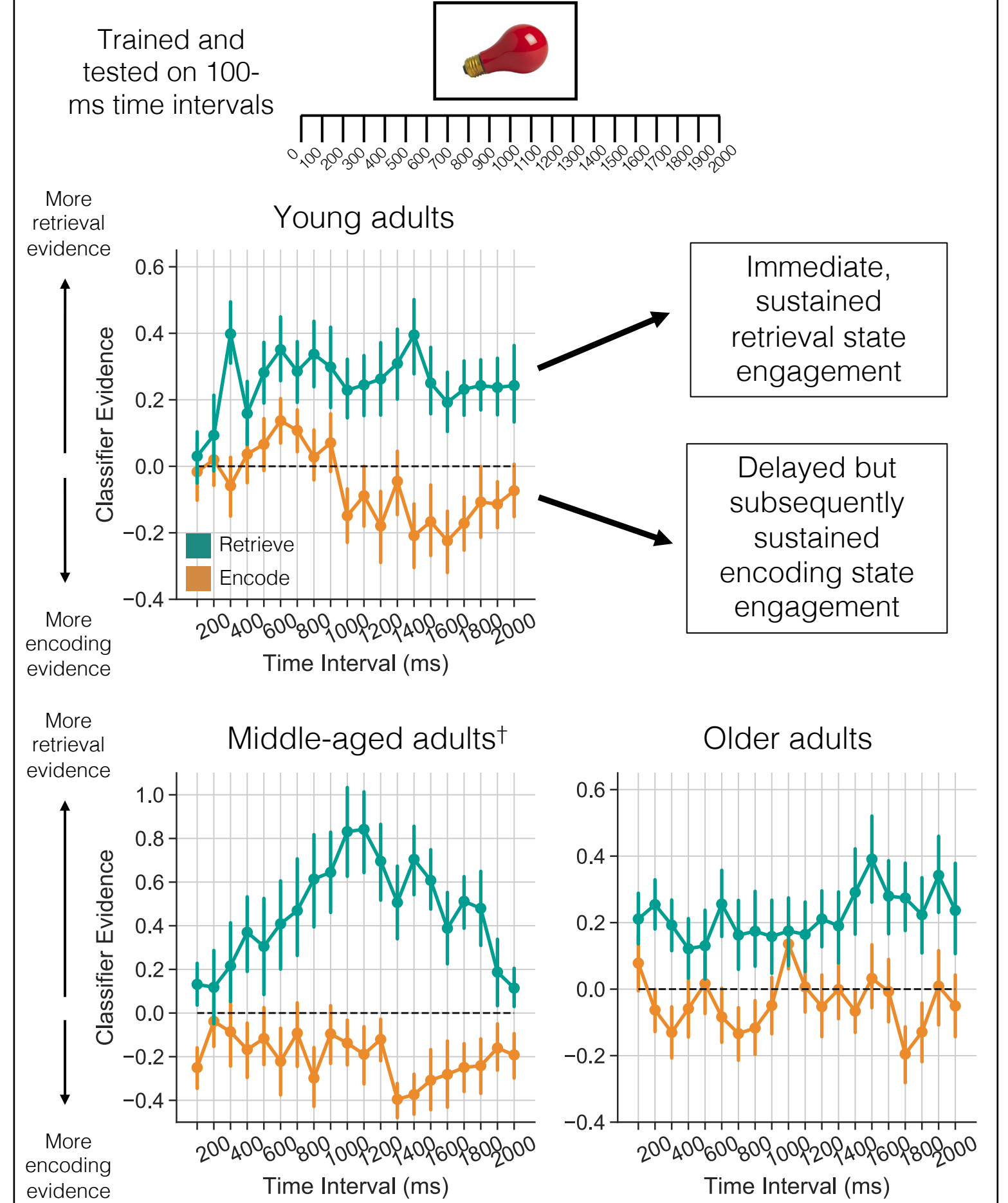
Memory brain states can be decoded via MVPA



[†]Data collection is ongoing

* p < 0.05, ** p < 0.01, *** p < 0.001

Memory brain state engagement over time



Summary

- All age groups shift between memory encoding and retrieval
- Encoding and retrieval states can be distinguished using MVPA in middle-aged and older adults
- Whereas young and middle-aged adults increasingly engage in an encoding state over time, older adults do not

Future directions

- Finish middle-aged adult data collection
- Directly link memory brain states to memory performance
- Assess which features drive classification and if feature weights differ across age groups