



# Joint Effects of Self-Referencing and Emotion on Memory in Aging and aMCI

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## Introduction

Memory performance can be enhanced by certain types of information:

- information related to the self (self-reference effect)<sup>1,2</sup>
- that which is emotional (emotional enhancement effect)<sup>3,4</sup>.

Older adults (OAs) have shown both self-reference and the emotional enhancement effects. There is some evidence for the self-reference effect among people with amnesic mild cognitive impairment (aMCI)<sup>1,2</sup>. However, there has been little work showing the joint benefits of these two strategies in these population groups.

## Goal of Present Study

- Does emotional information (positive or negative) influence the self-reference effect in memory?
- If effects are present, do those influences differ across OAs and aMCIs?

## Methods

### Participants

22 people with aMCI and 22 age and education matched healthy OA controls

### Task<sup>5</sup>

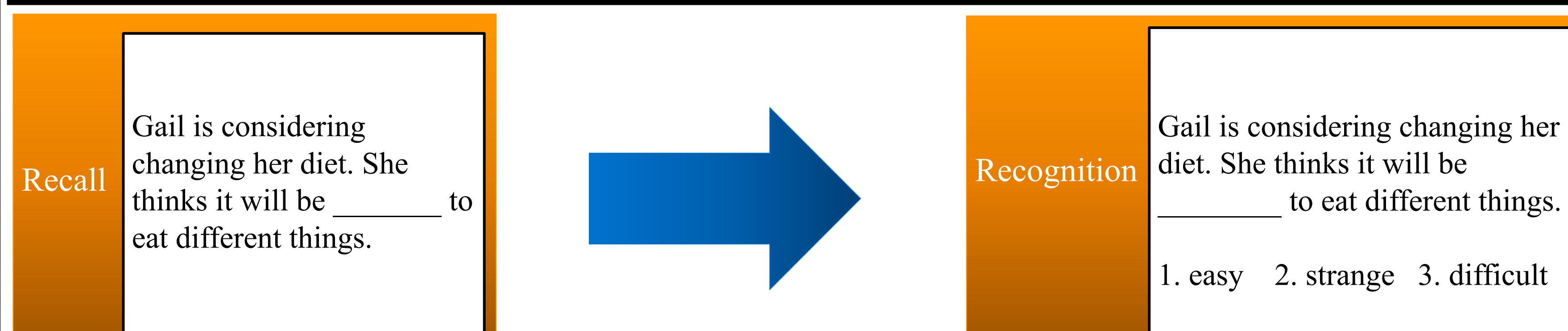
#### Sentence Encoding

##### Reference Manipulation

##### Emotion Manipulation

Reference Manipulation	Emotion Manipulation		
SELF	POSITIVE	NEUTRAL	NEGATIVE
You are considering changing your diet. you think it will be easy to eat different things.	Gail is considering changing her diet. She thinks it will be <u>easy</u> to eat different things.	Gail is considering changing her diet. She thinks it will be <u>strange</u> to eat different things.	Gail is considering changing her diet. She thinks it will be <u>difficult</u> to eat different things.
OTHER			
Gail is considering changing her diet. She thinks it will be easy to eat different things.			

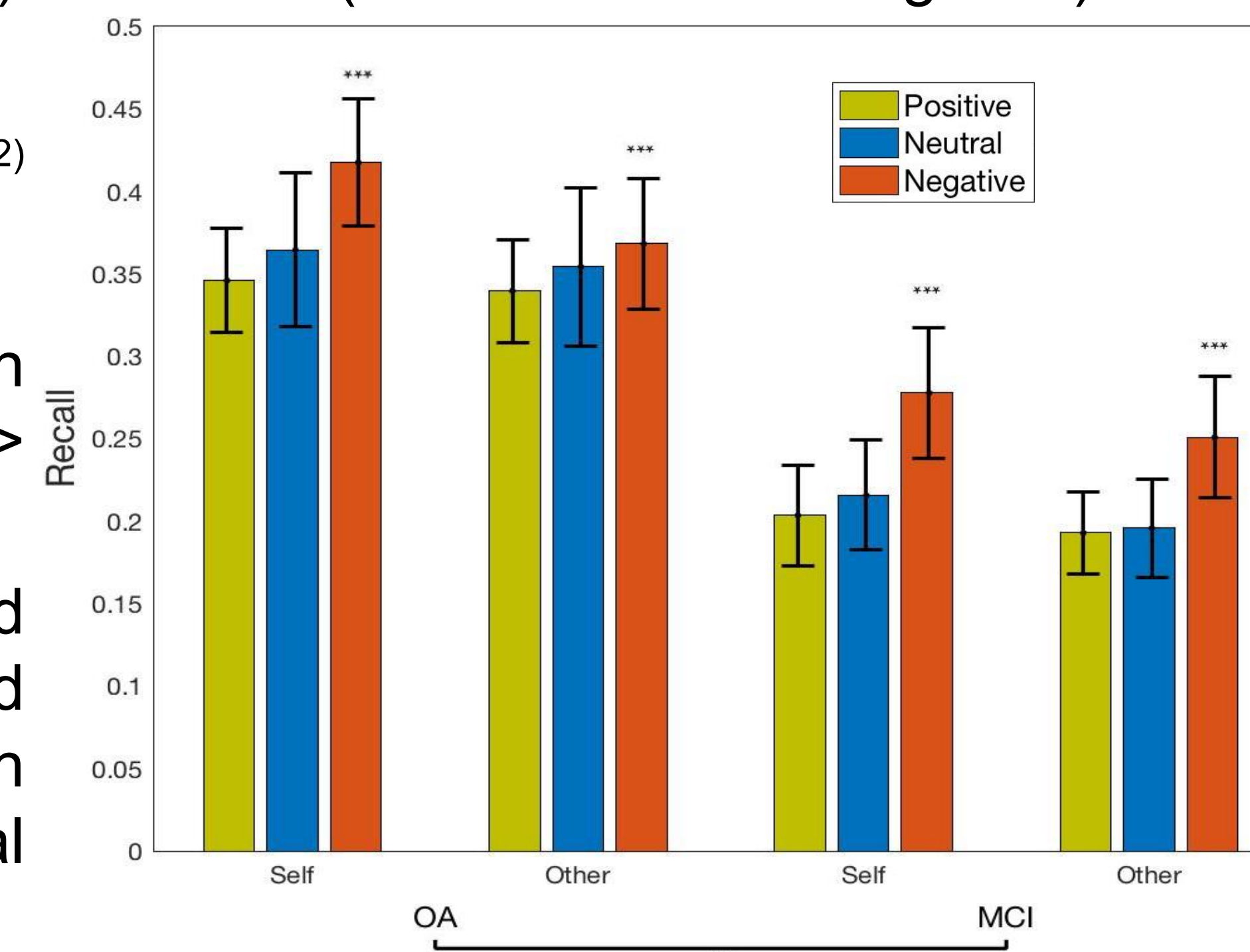
#### Cued Retrieval



## Recall Results

Group (OA/aMCI) x Reference (Self/Other) x Emotion (Positive/Neutral/Negative)

- Significant main effect of group ( $F_{(1, 42)} = 10.29, p = .003$ ): OA > aMCI
- Significant main effect of emotion ( $F_{(2, 84)} = 7.60, p = .001$ ): Negative > Positive and Neutral
  - Pairwise comparisons showed that negative items were recalled at a higher rate than both positive ( $p < .001$ ) and neutral ( $p = .005$ ) items



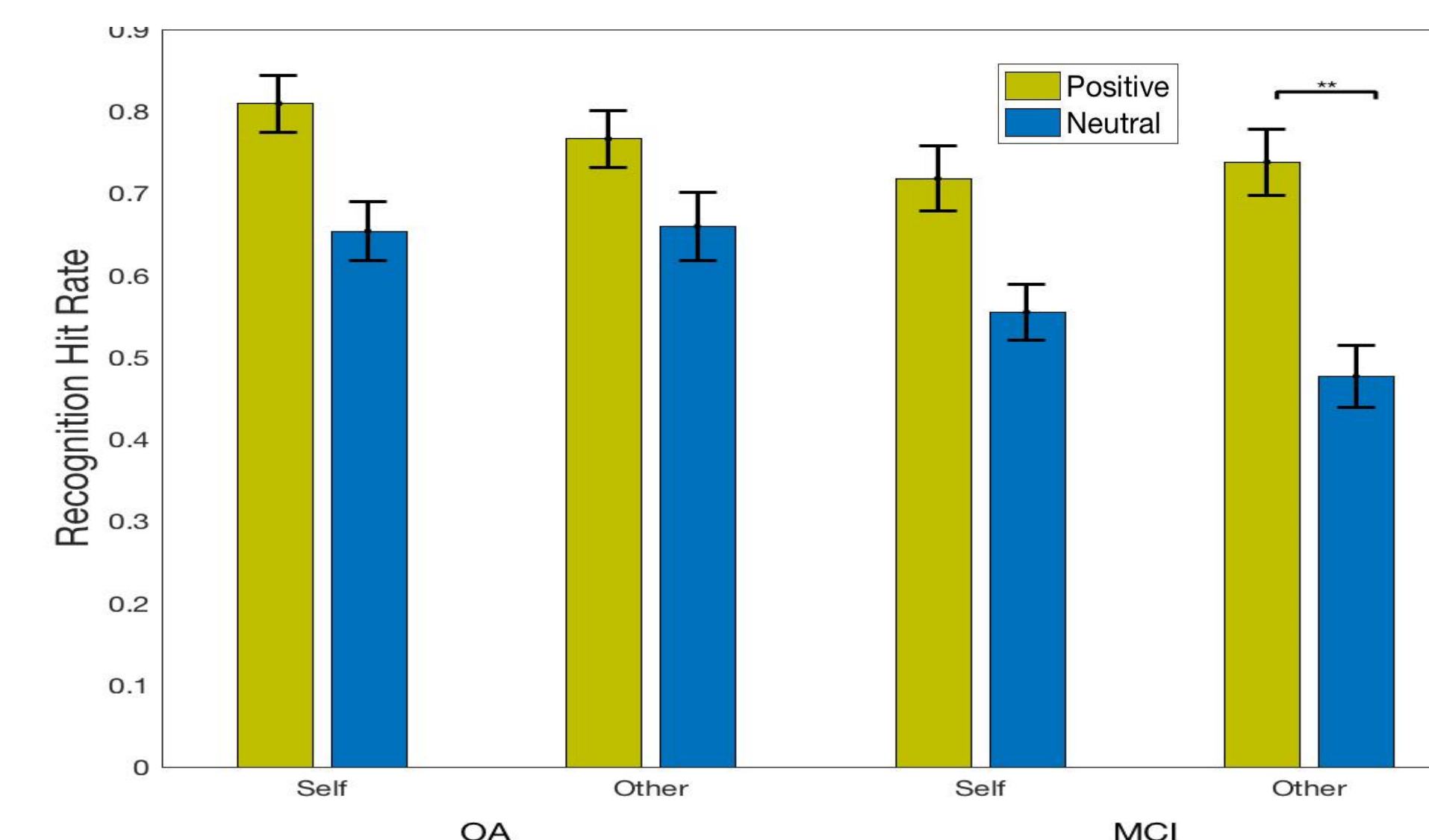
## Recognition Results

2 Group (OA/aMCI) x 2 Reference (Self/Other) x 3 Emotion (Positive/Neutral/Negative)

$$F_{(2, 84)} = 3.35, p = .04$$

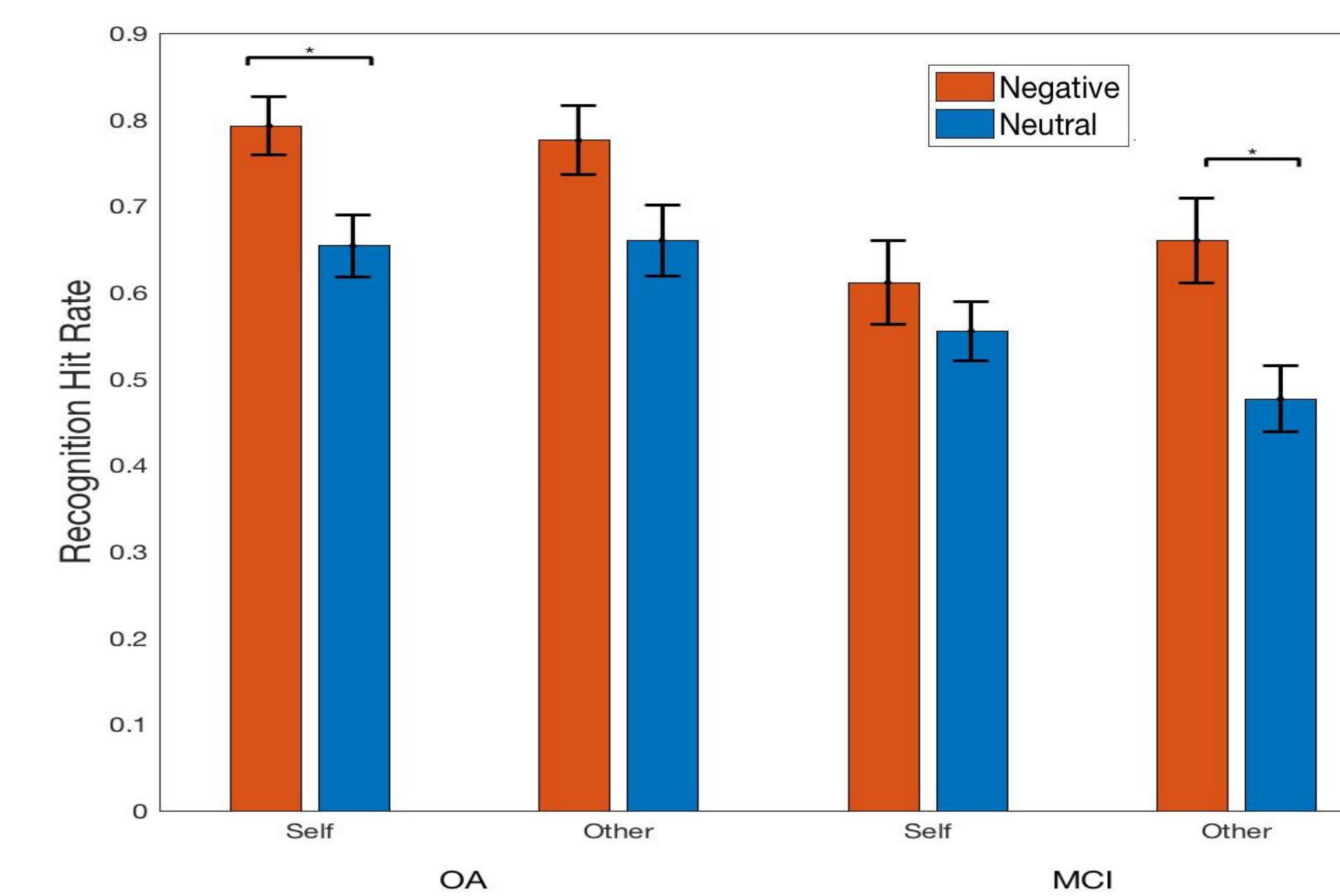
**2 Group X 2 Reference X 2 Emotion: Positive v/s Neutral ( $F_{(1, 42)} = 5.75, p = .02$ )**

- There was a larger difference between positive and neutral emotion for the other reference condition for aMCIs compared to OAs.



**2 Group X 2 Reference X 2 Emotion: Negative v/s Neutral ( $F_{(1, 42)} = 4.15, p = .048$ )**

- aMCIs showed a larger advantage for negative > neutral emotion compared to OAs for the other reference condition.
- OAs showed a larger advantage for negative > neutral emotion compared to aMCIs for the self-reference condition.



## Discussion

### Recall:

- OAs > aMCIs on the free recall task
- For both groups, Negative > Positive and Neutral, contradicting the "positivity bias"<sup>6,7</sup>
- No significant interactions -> emotional information did not influence the self-reference effect for OAs and aMCIs

### Recognition:

- Significant interaction of group, reference and emotion
- aMCIs showed a larger enhancement from positive and negative information compared to neutral when referenced to another person
- In comparison, OAs remembered negative > neutral when referenced to the self
- The way emotion influences the self-reference effect appears to differ between OAs and aMCIs. Emotional information does not have an effect on self-reference recognition for aMCIs, but OAs remember negative self-referenced information better than neutral self-referenced information
- Thus, self-reference and emotion both can enhance memory in aMCI, but the effects combine in different ways

## References

- Carson, N., Rosenbaum, R. S., Moscovitch, M., & Murphy, K. J. (2018). Self-Reference Effect and Self-Reference Recollection Effect for Trait Adjectives in Amnesic Mild Cognitive Impairment - Erratum. *J Int Neuropsychol Soc*, 24(8), 892. doi:10.1017/S1355617718000899
- Rosa, Deason, Budson, & Gutches. (2016). Source Memory for Self and Other in Patients With Mild Cognitive Impairment due to Alzheimer's Disease. *Journals of Gerontology Series B-Psychological Sciences and Social Sciences*, 71(1), 59-65. doi:10.1093/geronb/gbu062
- Kensinger, E. A. (2004). Remembering emotional experiences: the contribution of valence and arousal. *Rev Neurosci*, 15(4), 241-251
- Waring, J.D., Dimsdale-Zucker, H.R., Flannery, S., Budson, A.E., Kensinger, E.A. Effects of mild cognitive impairment on emotional scene memory. *Neuropsychologia*. 2017;96:240-8. doi:10.1016/j.neuropsychologia.2017.01.011
- Fields, E.C., Kuperberg, G.R. It's All About You: An ERP Study of Emotion and Self-Relevance in Discourse. *NeuroImage*. 2012;62:562-574. doi: 10.1016/j.neuroimage.2012.05.003
- Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: the positivity effect in attention and memory. *Trends in Cognitive Sciences*, 9(10), 496-502. doi:10.1016/j.tics.2005.08.005
- Reed, A. E., & Carstensen, L. L. (2012). The theory behind the age-related positivity effect. *Front Psychol*, 3, 339. doi:10.3389/fpsyg.2012.00339

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