

# Factors affecting the emotional enhancement of memory

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## Introduction

**Emotion-enhanced memory (EEM):** Mnemonic advantage for emotional stimuli in comparison to neutral stimuli

*Which of these is most memorable?*



OR



**Mediation-Modulation model:** Demonstrates the effect of emotion on early long-term memory when mediated by cognitive factors including semantic relatedness and distinctiveness.

**Semantic relatedness:** The interrelatedness of images shown together; emotional stimuli are inherently more semantically related than neutral stimuli

**Distinctiveness:** How much an image stands out relative to the rest of the images presented; emotional stimuli are rendered more prominent when presented alongside neutral stimuli

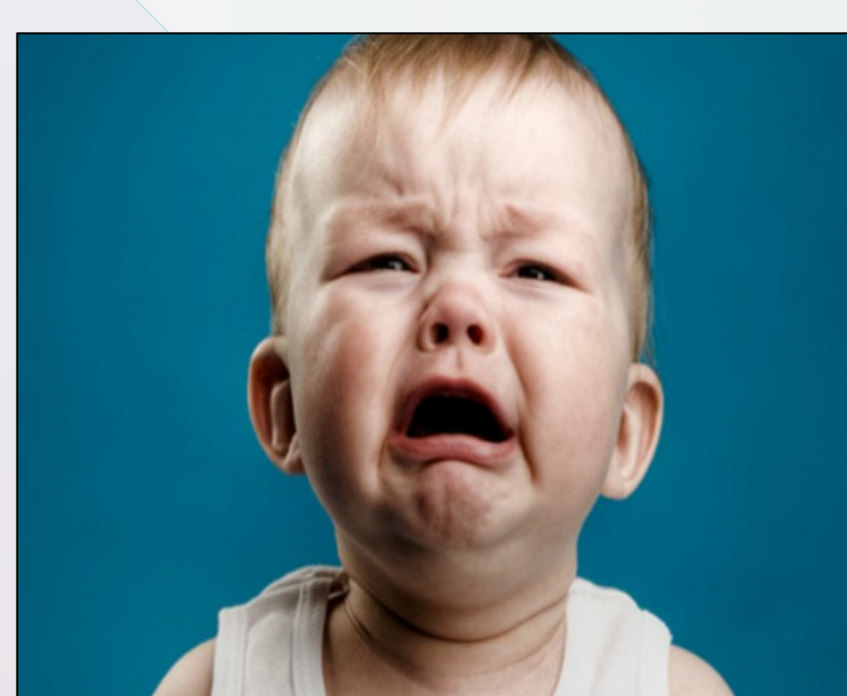
## Goal of the study

**Assess the role of semantic relatedness and distinctiveness on immediate and delayed memory recall in young adults**

Examples of Stimuli:



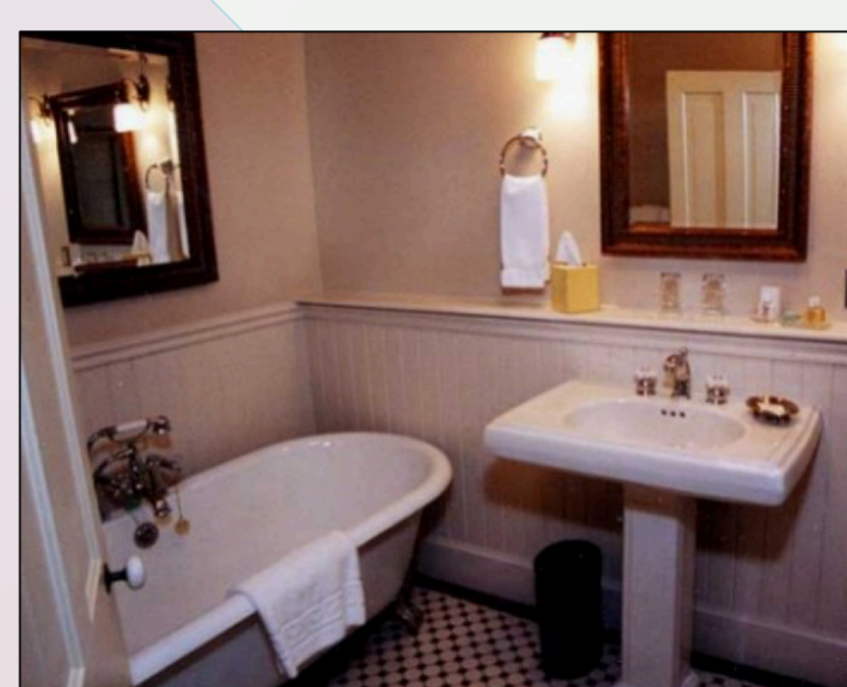
Neutral-Random



Negative



Positive



Neutral-Related

## Materials & methods

Stimuli:

16 positive, 16 negative, 16 neutral-random (low relatedness), 16 related-neutral (relatedness similar to that of emotional stimuli)

Procedure:

1. 4 blocks with 16 stimuli/block. Each block:

[Stimuli (2s)  
+ Blank screen(4s)]  
X 16

Arithmetic Task (1min)

3-min recall of stimuli presented

2. Health, sleep, mood questionnaires to assure the participants memory is not compromised.
3. Mental cognition assessments: MOCA, WCST, Digit span, etc.
4. 45 minutes after step 1: Delayed recall of all presented stimuli
5. Recognition task

2 participant conditions:

**Blocked:** Stimuli shown within each block are of the same emotional valence and relatedness

**Mixed:** Stimuli within each block are in randomized order.

## Participants

20 University of Ottawa students

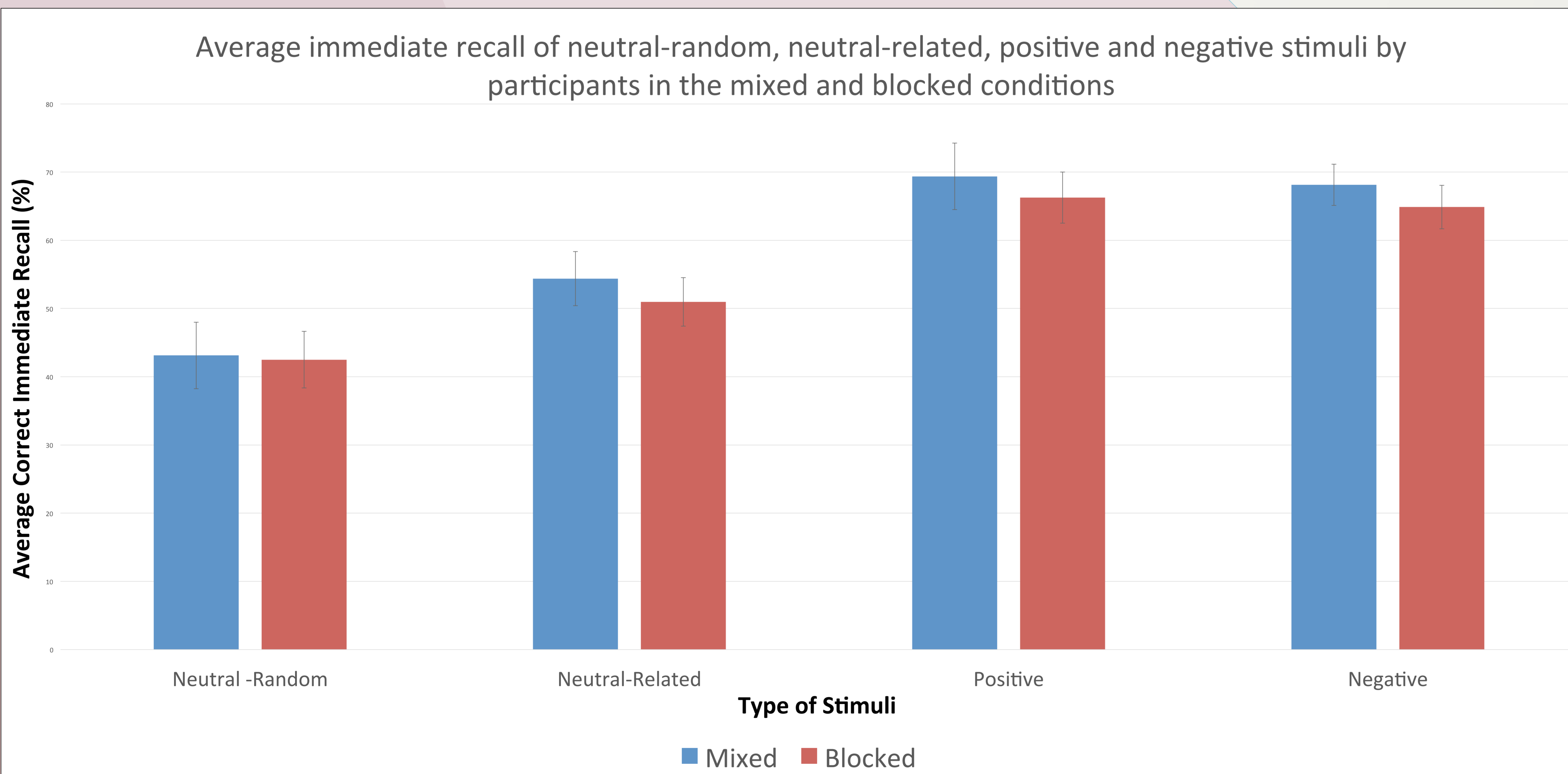
10 blocked

10 mixed

Mean age: 18.85 years old

## Results

- **In comparing conditions:**
  - There is no significant difference in the memory recall of stimuli between blocked and mixed conditions
- **In comparing types of stimuli:**
  - Neutral-random stimuli were recalled less often than neutral-related stimuli
  - Neutral-related stimuli were recalled significantly less often than emotional images



## Acknowledgements

A special thank you to volunteers Laurence and Vivian for all of their help with data collection and scoring

## References

- Talmi, Deborah. "Enhanced Emotional Memory Cognitive and Neural Mechanisms." *Current Directions in Psychological Science* 22.6 (2013): 430-436
- Talmi, Deborah, and Lucy M. McGarry. "Accounting for immediate emotional memory enhancement." *Journal of Memory and Language* 66.1 (2012): 93-108.

## Conclusion

- Classic EEM effect shown between neutral-random and emotional stimuli
- Although an increase in semantic relatedness appears to have increased recall performance for the neutral-related pictures, the emotional pictures were still better recalled than the former. This suggests that at least one other factor contributes to the difference in recall between emotional and neutral pictures.
- There is no significant effect of distinctiveness on the ability to recall stimuli