

Introduction

- Short-term memory tasks predict general intellectual ability (Jacobs, 1987)
- But why is memory predictive?
- Recent work has shown that variation in the ability to recall from episodic memory contributes to the correlation (Unsworth, 2009)
- Which episodic processes are critical?
- We examine individual differences in the order of recalls in free recall to determine which processes predict IQ

Penn Electrophysiology of Encoding and Retrieval Study

Experiment 1:

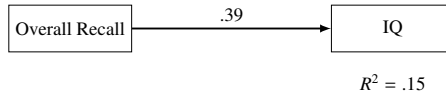
- 141 participants
- 7 sessions
- 16 16-word lists with immediate free recall

Experiment 2:

- 126 of the Exp 1 participants
- 7 sessions
- 12 16-word lists
- Mix of immediate, delayed, and continual distractor recall

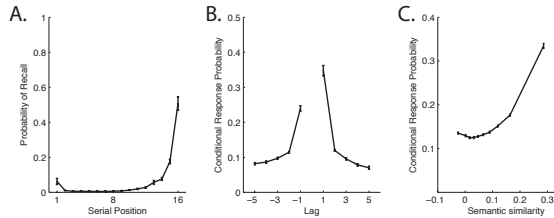
WAIS IQ on 101 participants.

Does overall recall predict full-scale IQ?



Which processes underlie variation in overall recall?

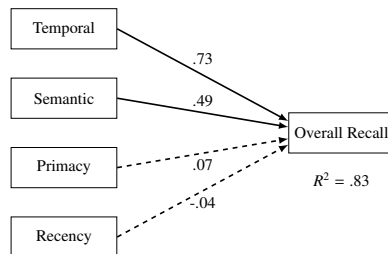
Order of recall described by: A) initiation; B) temporal contiguity; C) semantic contiguity



Individual differences in recall order described by 4 factors:

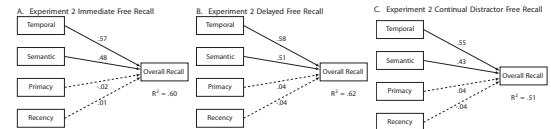
- **Temporal** contiguity
- **Semantic** contiguity
- **Primacy** initiation pattern
- **Recency** initiation pattern

These factors account for almost all variation in overall recall:



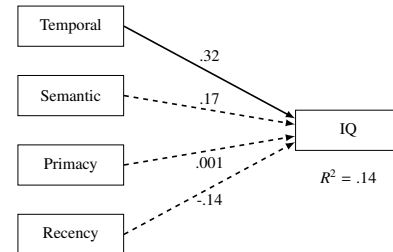
Does this factor structure generalize?

Yes, factors calculated from Exp 1 predict recall in the three different conditions of Exp 2:



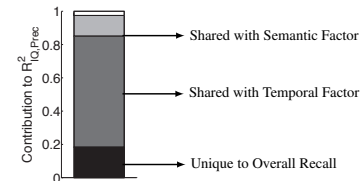
Which of these processes predict IQ?

Only the **temporal** factor:



Do the processes explain why overall recall predicts IQ?

Partition the variance shared between overall recall and IQ:



Conclusions

- Individual differences in recall ability accounted for by **Temporal** and **Semantic** processes
- The correlation between recall and IQ largely accounted for by **Temporal** processes

References

Jacobs, J. (1987). *Mind*, 12, 75–79; Unsworth, N. (2009). *Memory and Cognition*, 37, 837–849.