Individual differences in free recall and intelligence

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Introduction

Existing work on individual differences in memory has focused on the correlation between overall recall probability and fluid intelligence.

Here, we

- investigate correlational structure between measures of memory search in free recall
- use regression-based analyses to investigate underlying factors behind recall success
- correlate measures of free recall with IQ and investigate positive correlation between IQ and recall success

Methods

Penn Electrophysiology of Encoding and Retrieval Study (PEERS), Experiment 1:

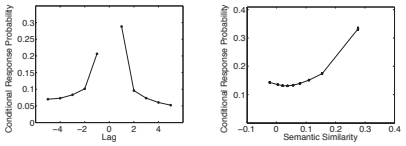
- 109 college-aged participants
- 1 practice session, 6 experimental sessions
- 16 lists of 16 words (common nouns)
- Each list constructed of pairs of words with varying semantic relatedness
- Varying encoding task: size, animacy, switch-task, no-task
- 75-second recall period following list presentation
- WAIS IQ data collected on subset of 69 participants

Terminology

CRP asymmetry ratio: ratio of values at +1 lag and -1 lag in the conditional response probability curve

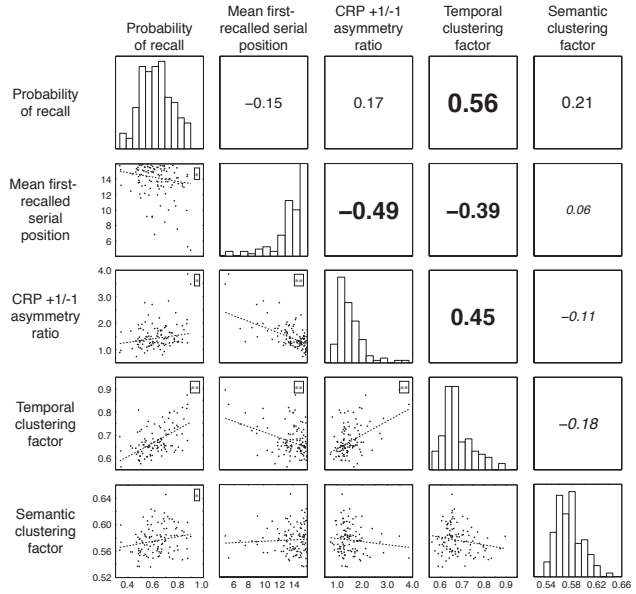
Temporal clustering factor: percentile-based measure of temporal contiguity

Semantic clustering factor: percentile-based measure of tendency to recall semantically-related words consecutively

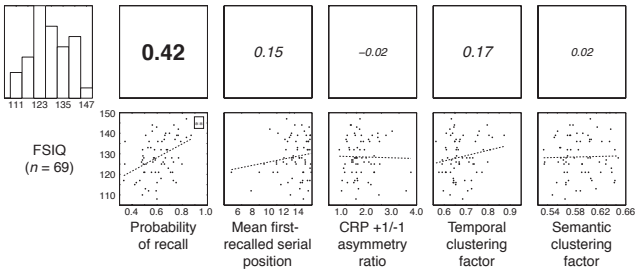


Correlational structure

Correlations between memory measures



Correlations with IQ



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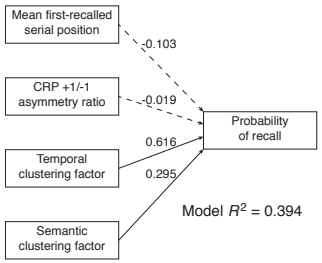
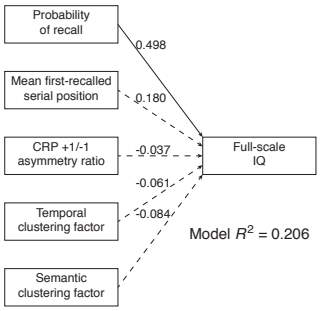
Multivariate linear regressions

How much variance in probability of recall is accounted for by recall initiation, asymmetry, and temporal and semantic clustering?

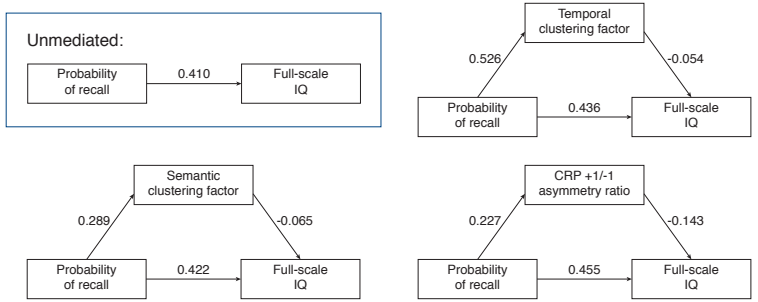


How much variance in FSIQ is accounted for by measures of memory behavior?



Mediation

Is the relationship between probability of recall and FSIQ mediated by clustering or recall asymmetry?



Conclusions

Of the measures of recall dynamics (clustering, initiation, asymmetry) examined here, temporal and semantic clustering measures are the strongest predictors of overall recall probability.

There exists a strong correlation between recall probability and full-scale WAIS IQ

Despite being predictors of recall probability, clustering measures are poor predictors of FSIQ

Furthermore, none of the memory measures used here mediates the correlation between recall probability and full-scale IQ.