Modeling intralist and interlist effects in free recall

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Introduction

* Most memory models address only single-trial phenomena

* The challenge is to explain both intralist and interlist phenomena using a single model

* We attempt to account for prior-list and extra-list recalls in immediate free recall and the list-before-last paradigm

Continuous-memory version of the context maintenance and retrieval model (CMR2)
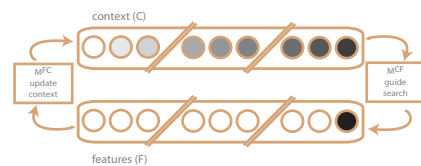
* For each simulated participant, all items in the session are represented in the model

* Memory is not reset between trials

* Input to context: driven by studying or recalling an item, or by a delay between lists
$$c_i^{IN} = M^{FC} f_i$$

* Update context and context-item associations
$$c_i = \rho_i c_{i-1} + \beta c_i^{IN}$$
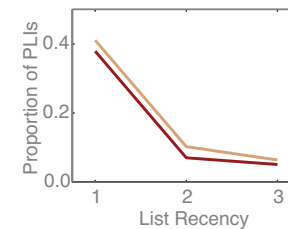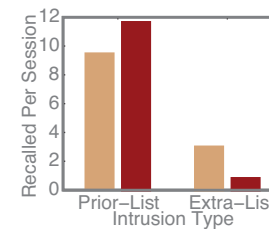$$\Delta M_{exp}^{FC} = (\Delta M_{exp}^{CF})^\top = c_{i-1} f_i^\top$$

* Recall process
$$x_s = (1 - \tau\kappa - \tau\lambda N)x_{s-1} + \tau f_r^{IN} + \varepsilon, \quad \text{where} \quad f_r^{IN} = M^{CF} c_r$$
Each item has a dynamic threshold $\theta = 1 + \omega\alpha^j$
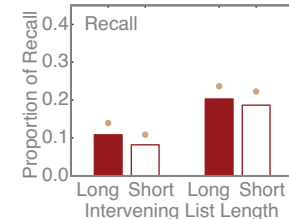Determine if the retrieved item is from the correct list $c_{r+1}^{IN} \cdot c_r$
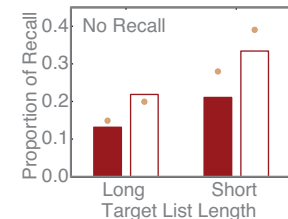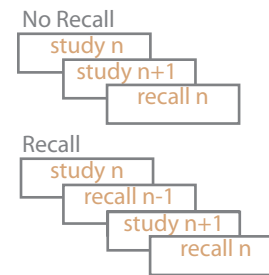
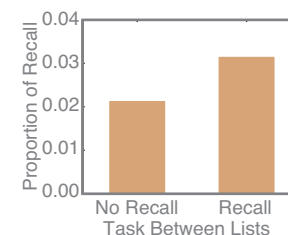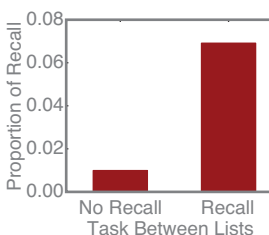## Interlist effects in immediate free recall

* Reliable number of prior-list and extra-list intrusions

* Prior-list intrusions tend to be recalled from recent lists

Interlist effects in the list-before-last paradigm

No Recall
study n
study n+1
recall n

Recall
study n
recall n-1
study n+1
recall n

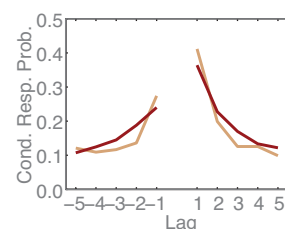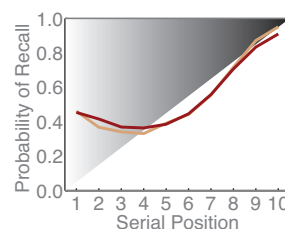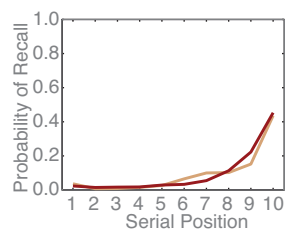## Intralist effects in the list-before-last paradigm

* Target-list recalls less for
  - longer target list-length
  - longer intervening list-length with no recall

* Intervening-list recalls less with no recall between lists

Intralist effects in immediate free recall

Data
CMR2

Conclusions

* CMR2 accounts for interlist and intralist effects in immediate free recall and the list-before-last paradigm

* Slowly evolving temporal context, semantic context, and noisiness in the recall process control interlist recall levels

References
Jang, Y. and Huber, D. E. (2008). Context retrieval and context change in free recall: Recalling from long-term memory drives list isolation. JEP: LMC, 34(1), 112-127.
Kahana, M.J., Howard, M.W., Zaromb, F. and Kahana, M.J. (2002). Age dissociates recency and lag recency effects in free recall. JEP: LMC, 28(3), 530-540.
Polyn, S.M., Norman, K.A. and Kahana, M.J. (2009). A context maintenance and retrieval model of organizational processes in free recall. Psychological Review, 116(1) 129-156.