

Compound cueing in free recall

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1 Introduction

* In serial recall, participants use an amalgam of previously presented items as a compound cue

* We used recall sequences and response times to examine this phenomenon in free recall

2 Methods

Make conditional response probability and latency curves as a function of lag (lag-CRP and lag-CRL) separately depending on the lag of the *previous* transition

9 10 5 4 2

standard lag-CRP / lag-CRL
calculate for every transition

9 10 5 4 2

+1 compound lag-CRP / lag-CRL
transition contributes only if prior lag = +1

9 10 5 4 2

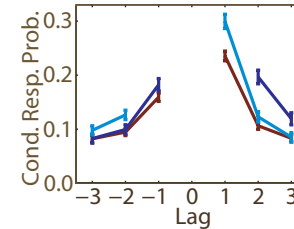
-1 compound lag-CRP / lag-CRL
transition contributes only if prior lag = -1

9 10 5 4 2

"control" compound lag-CRP / lag-CRL
transition contributes only if |prior lag| > 3

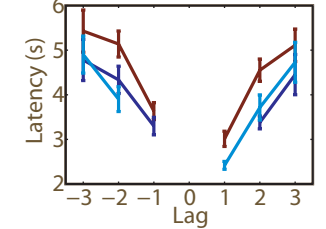
3 Participants exhibit compound cueing

Compound lag-CRP

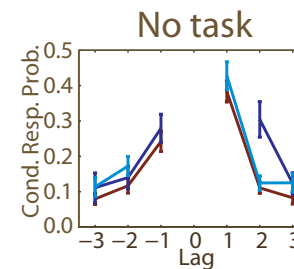
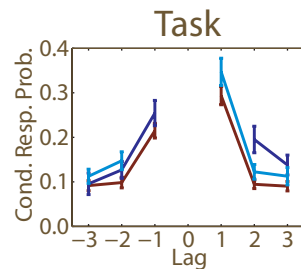


+1: tend to another +1
-1: tend to another -1
larger lags: standard

Compound lag-CRL



4 Encoding task promotes compound cueing



5 Context maintenance and retrieval model

* Input to context: driven by studying or recalling an item

$$c_i^{IN} = M^{FC} f_i$$

* Update context and context-item associations

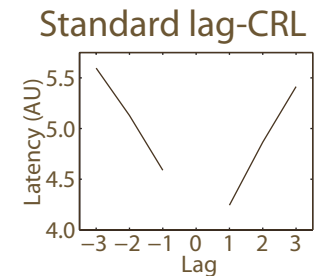
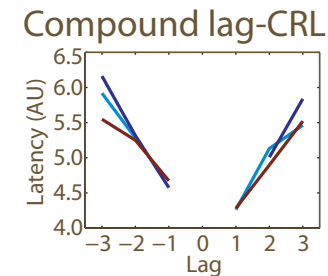
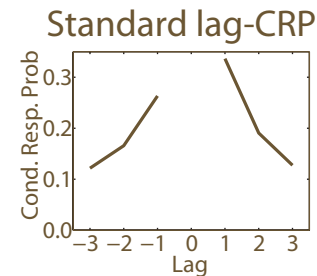
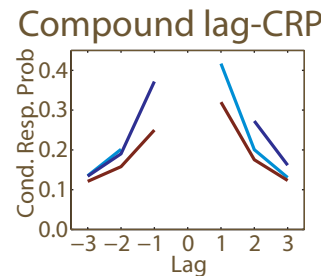
$$c_i = \rho_i c_{i-1} + \beta c_i^{IN}$$

$$\Delta M_{exp}^{FC} = (\Delta M_{exp}^{CF})^T = c_i f_i^T$$

* Recall process

$$x_j = (1 - \tau\kappa - \tau\lambda N)x_{j-1} + \tau f_j^{IN} + \epsilon, \text{ where } f_j^{IN} = M^{CF} c_j$$

6 CMR predicts compound cueing



7 Conclusions

Participants exhibit compound cueing:

- * as reflected in recall probabilities and latencies
- * when they use internally-generated cues
- * when they do not need to remember items in serial order
- * as predicted by the CMR model

8 References

- Kahana, M.J. (1996). Associative retrieval processes in free recall. *Memory & cognition*, 30, 823-840.
- Polyn, S.M., Norman, K.A., Kahana, M.J. A context maintenance and retrieval model of organizational processes in free recall. *Psychological Review*, 116 (1), 129-156.
- Posnansky, C.J. (1972). Probing for the functional stimuli in serial learning. *Journal of Experimental Psychology*, 96(1), 184-193.