

INTRODUCTION

Similarity and overlap of information play a role in learning and memory in two well-established yet conflicting ways:

- Overlap of information can lead to interference^{1,2,3,4}
- Overlap of information can facilitate new learning^{5,6}

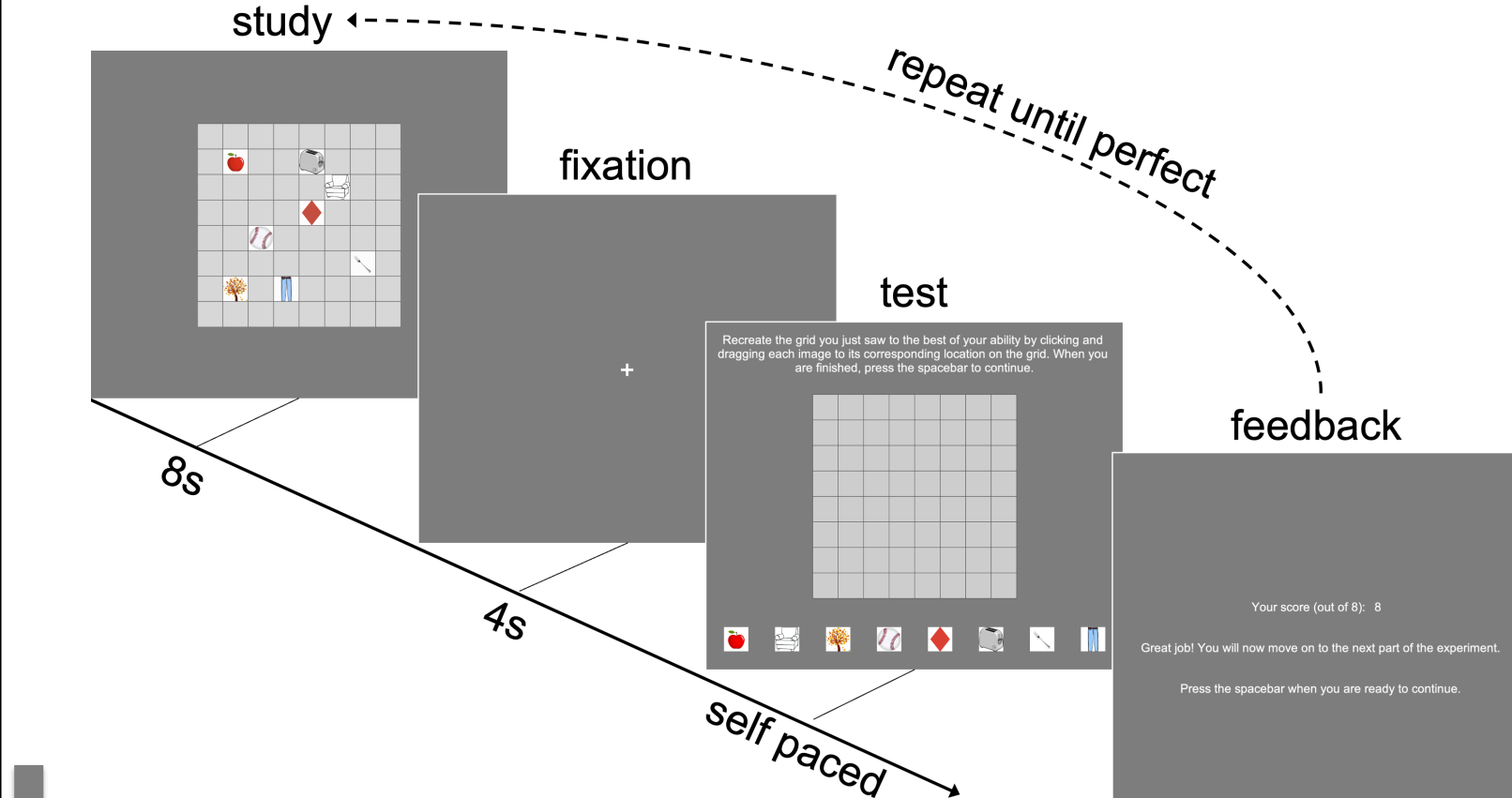
We explored two dimensions of overlap:

- Content overlap (same stimuli)
- Location overlap (same locations)

Do content overlap and location overlap differentially affect learning and memory?

GRID TASK

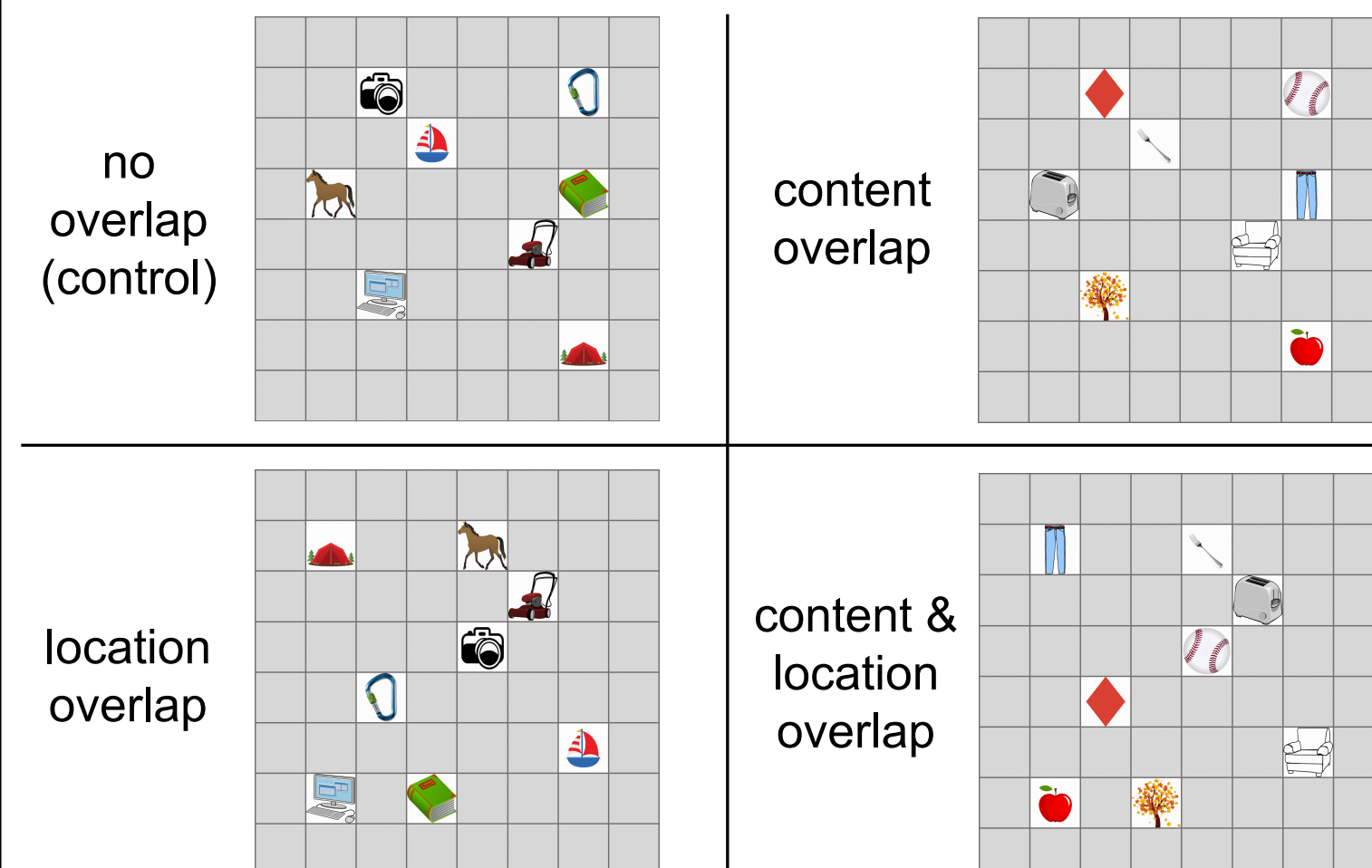
Grid 1: Eight object-location associations



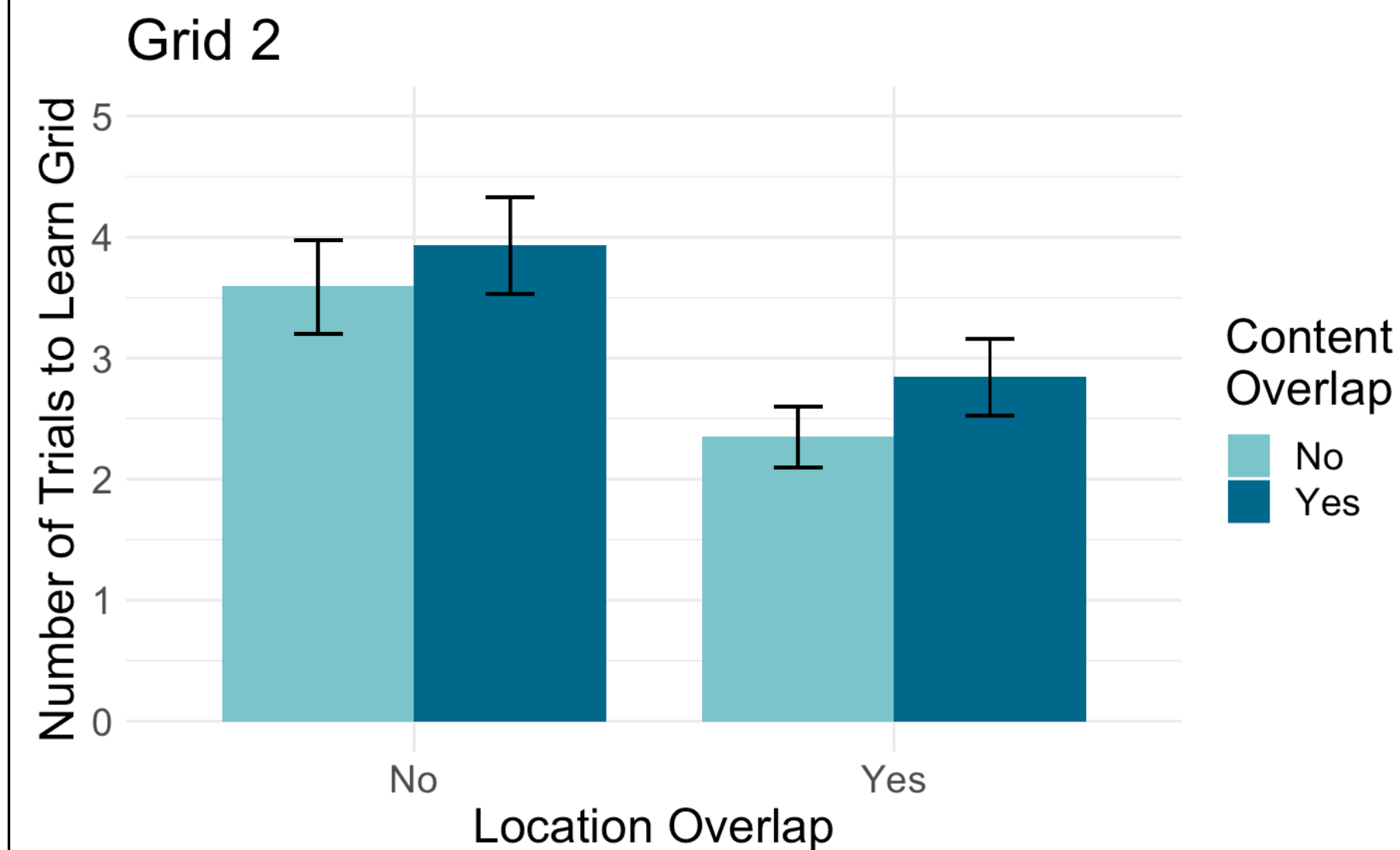
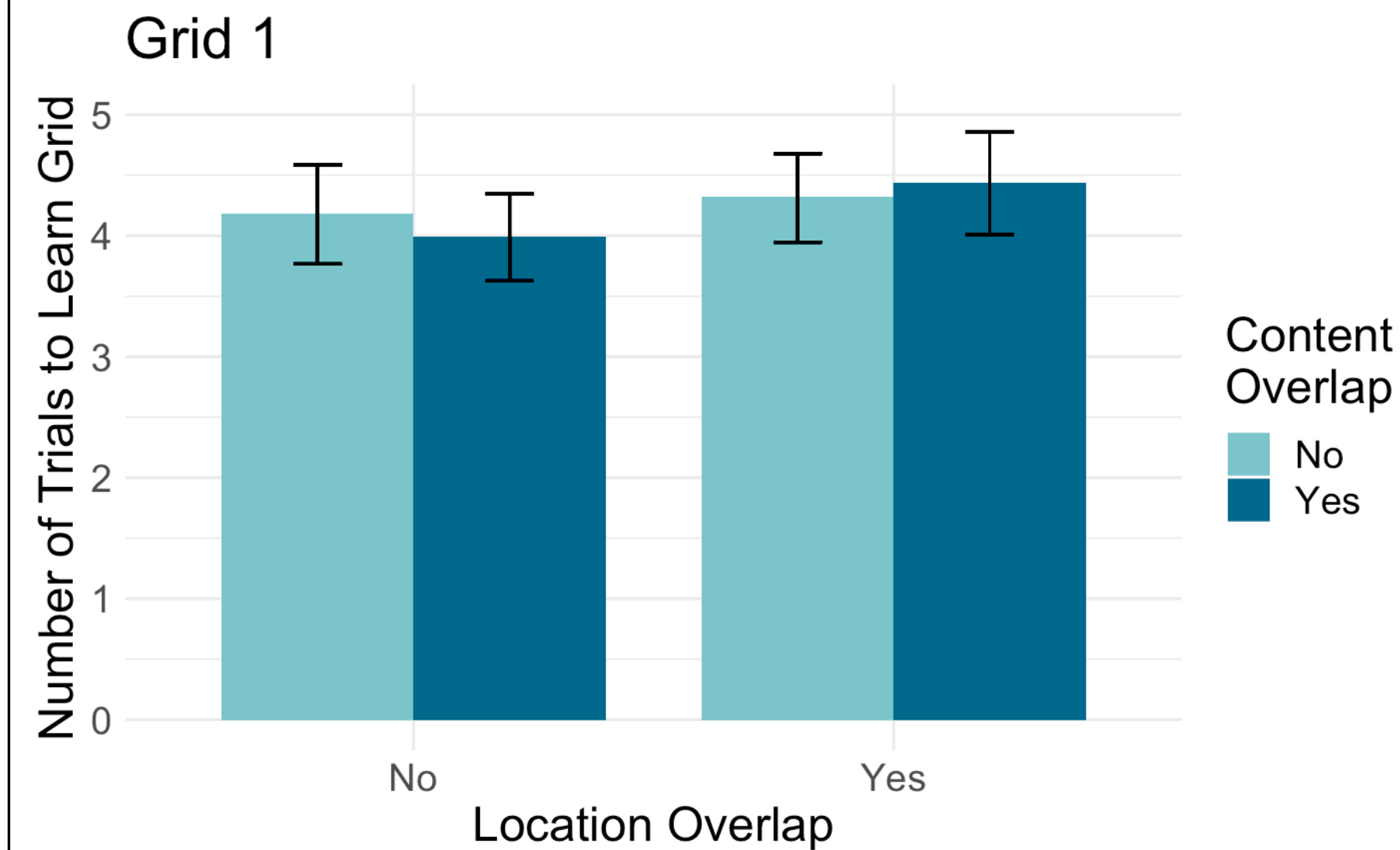
Distractor Math Task: Attention Check and WM Flush

Grid 2: Eight new object-location associations

Second grid differed from first by one of the ways shown below:

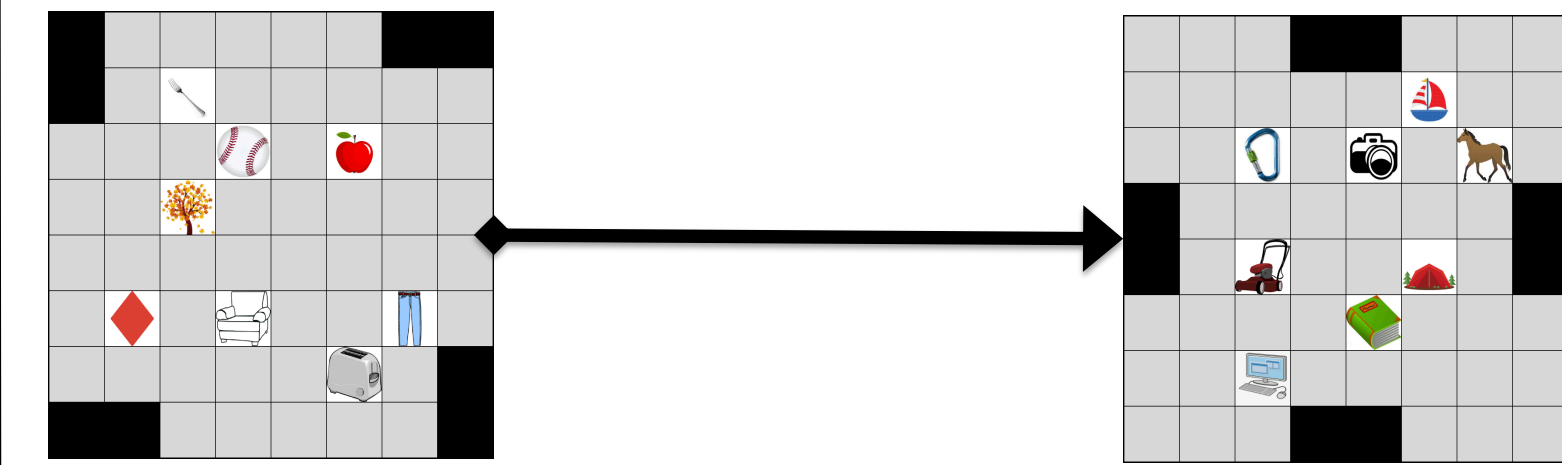


RESULTS: DIFFERENTIAL EFFECTS OF OVERLAP



- Content overlap → slower learning of the second grid
- Location overlap → faster learning of the second grid; the beginnings of a spatial schema?⁵
- No interaction: the effects are independent and additive

FUTURE EXP. 2: Do interference and facilitation generalize across environments?



Three factors: content overlap x location overlap x grid shape

- Does the same facilitatory effect emerge for global spatial pattern (grid shape)?
- Does global spatial pattern (grid shape) interact with the effect of content overlap and/or location overlap?

SUMMARY

- Content overlap can cause interference and hinder learning and memory
- Location overlap can facilitate learning
- Spatial schemas may serve as a scaffolding for new information

REFERENCES

¹Bunting, M. (2006). Proactive interference and item similarity in working memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 32 (2), 183.

²Goggin, J., & Wickens, D. D. (1971). Proactive interference and language change in short-term memory. *Journal of Verbal Learning and Verbal Behavior*, 10 (4), 453–458.

³Unsworth, N., Brewer, G. A., & Spillers, G. J. (2013). Focusing the search: Proactive and retroactive interference and the dynamics of free recall. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 39 (6), 1742.

⁴Wickens, D. D., Born, D. G., & Allen, C. K. (1963). Proactive inhibition and item similarity in short-term memory. *Journal of Verbal Learning and Verbal Behavior*, 2 (5-6), 440–445.

⁵Tse, D., Langston, R. F., Kakeyama, M., Bethus, I., Spooner, P. A., Wood, E. R., Morris, R. G. (2007). Schemas and memory consolidation. *Science*, 316 (5821), 76–82.

⁶van Kesteren, M. T., Ruitter, D. J., Fernández, G., & Henson, R. N. (2012). How schema and novelty augment memory formation. *Trends in Neurosciences*, 35 (4), 211–219.