

Concurrent Inhibition and Facilitation by the Contents of Visual Working Memory During Visual Search

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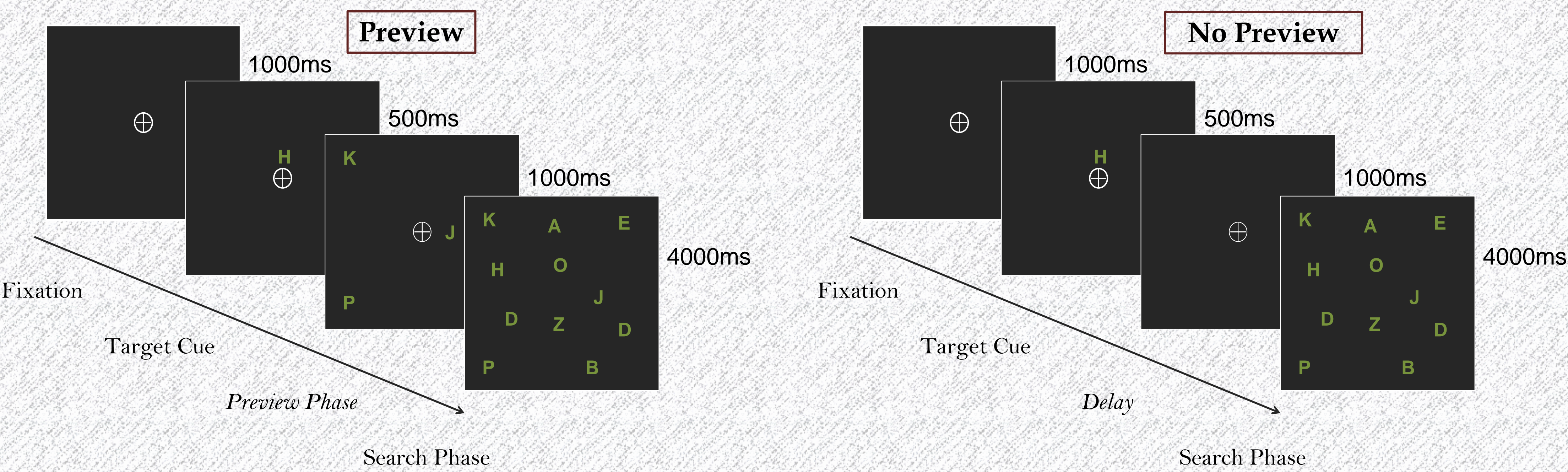
Background

Visual working memory contributes to visual search in 2 distinct ways:

- 1) Records distractors processed during search, subsequently *inhibiting* them¹
- 2) Stores the identity of the search target, *facilitating* stimuli resembling this target template^{2,3}

Can VWM simultaneously support both processes?

Experiment 1



Set Size: 0, 1, 2, 3, 4, 5, 7 previewed items + 8 additional search items
BLOCKS:

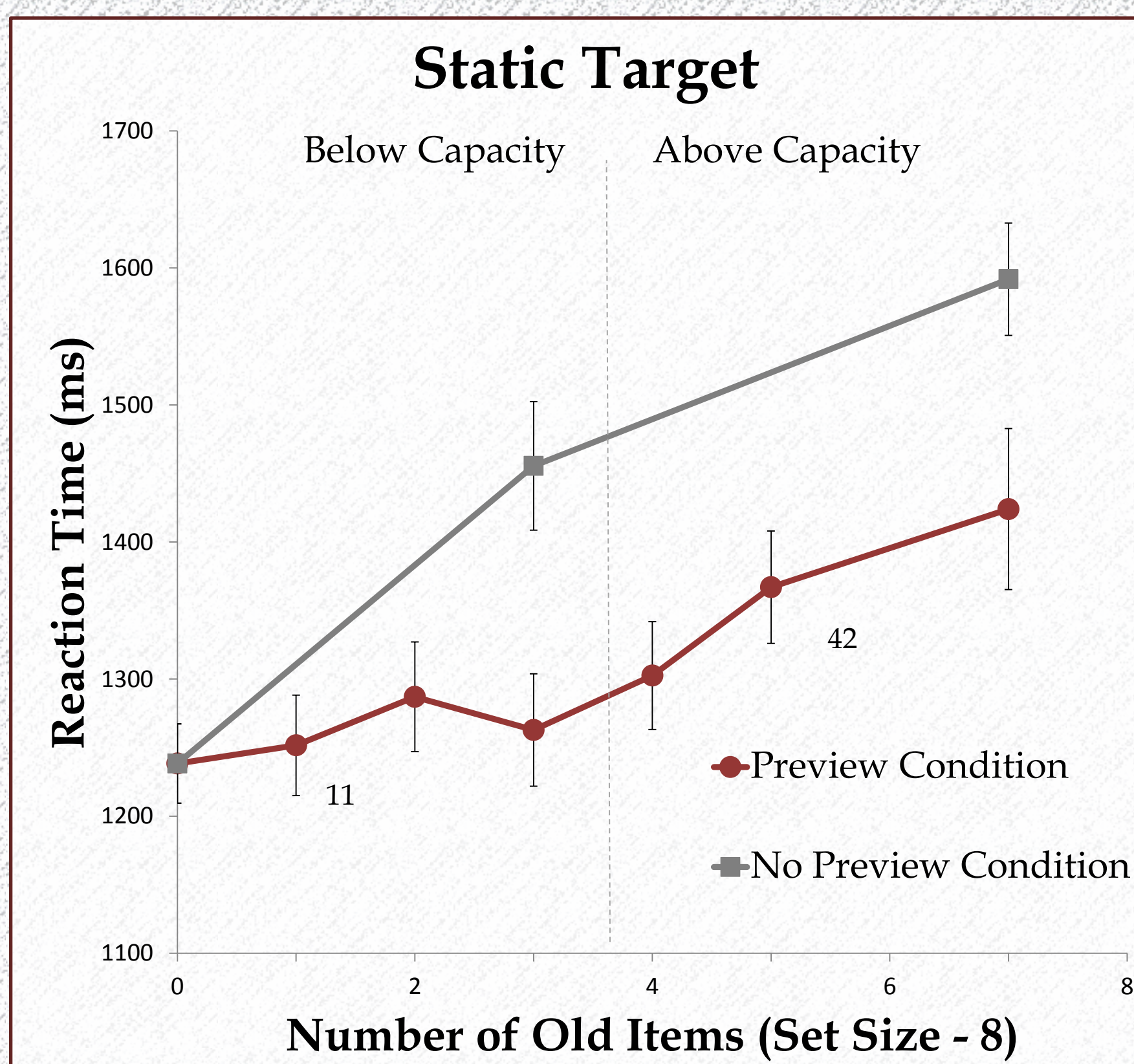
Static Target: Search target is the same on every trial (LTM)

Variable Target: Search target changes on each trial (VWM)

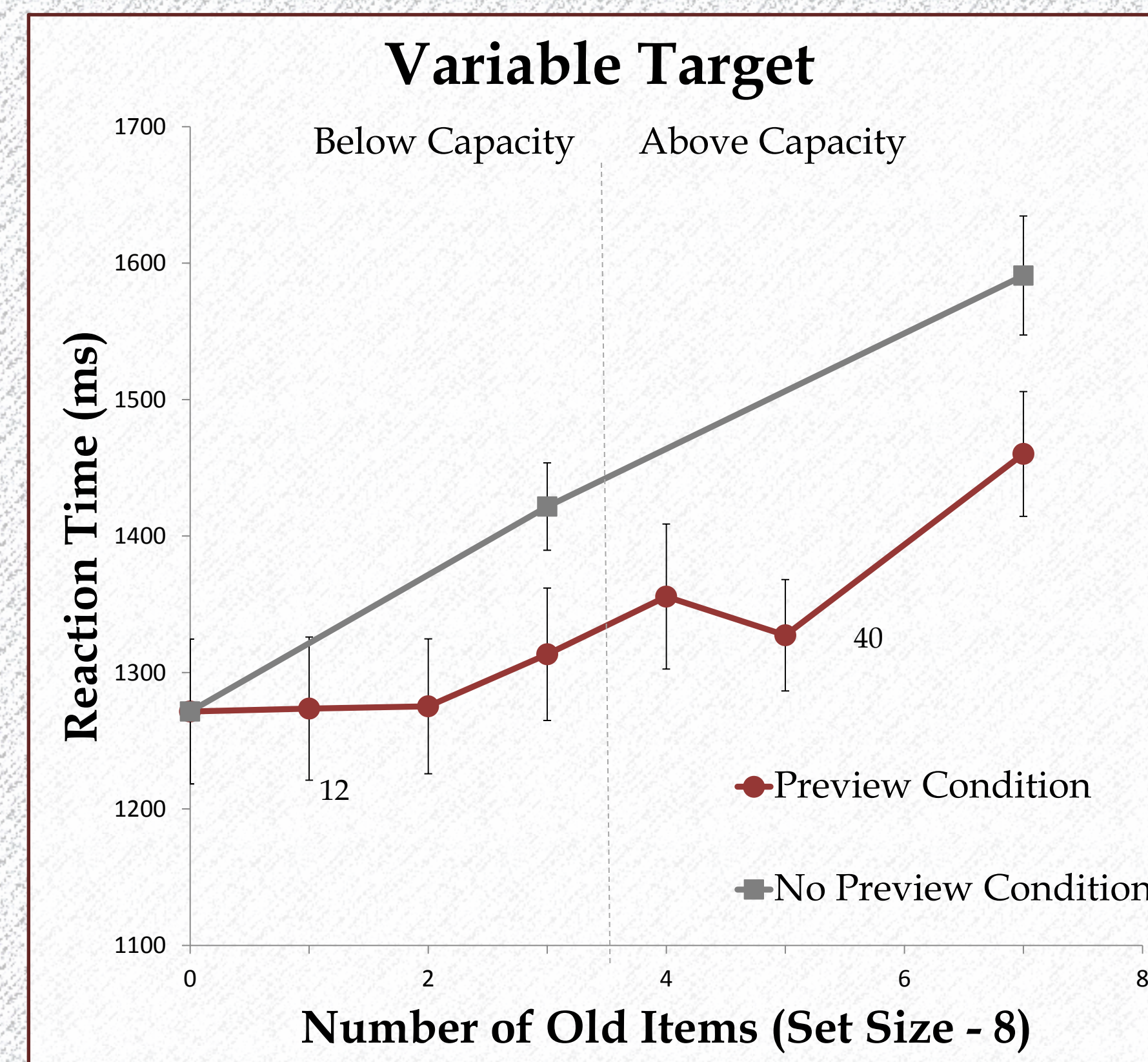
Set Size: 3 + 8 search items or 7 + 8 search items
BLOCKS:

Static Target

Variable Target



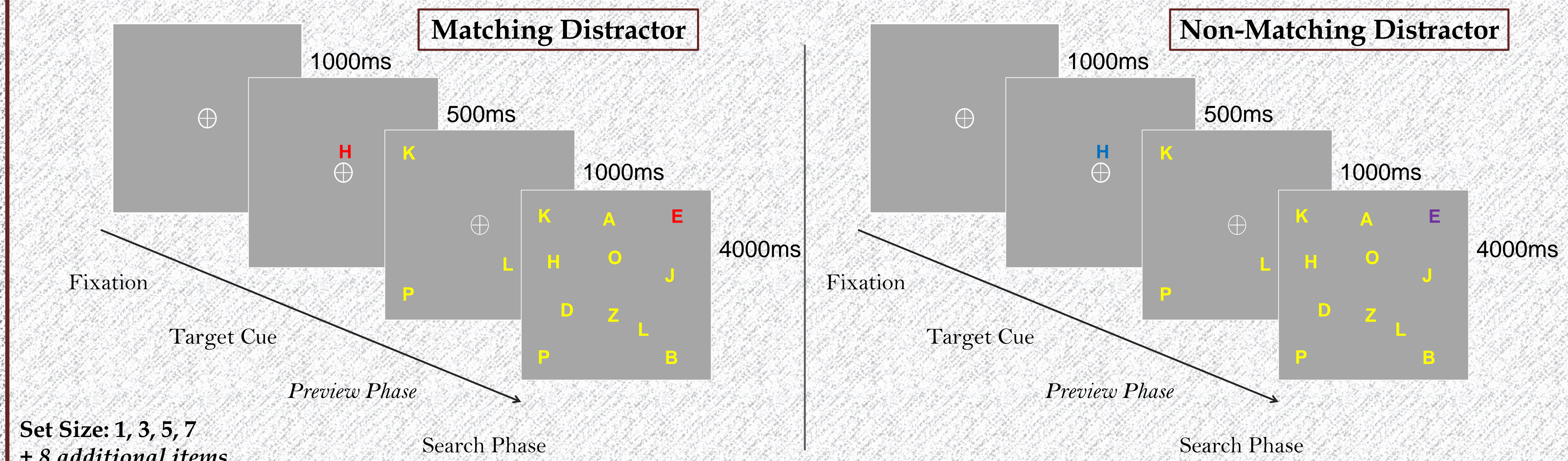
Replication of working memory based preview inhibition with a static target (supported by LTM)



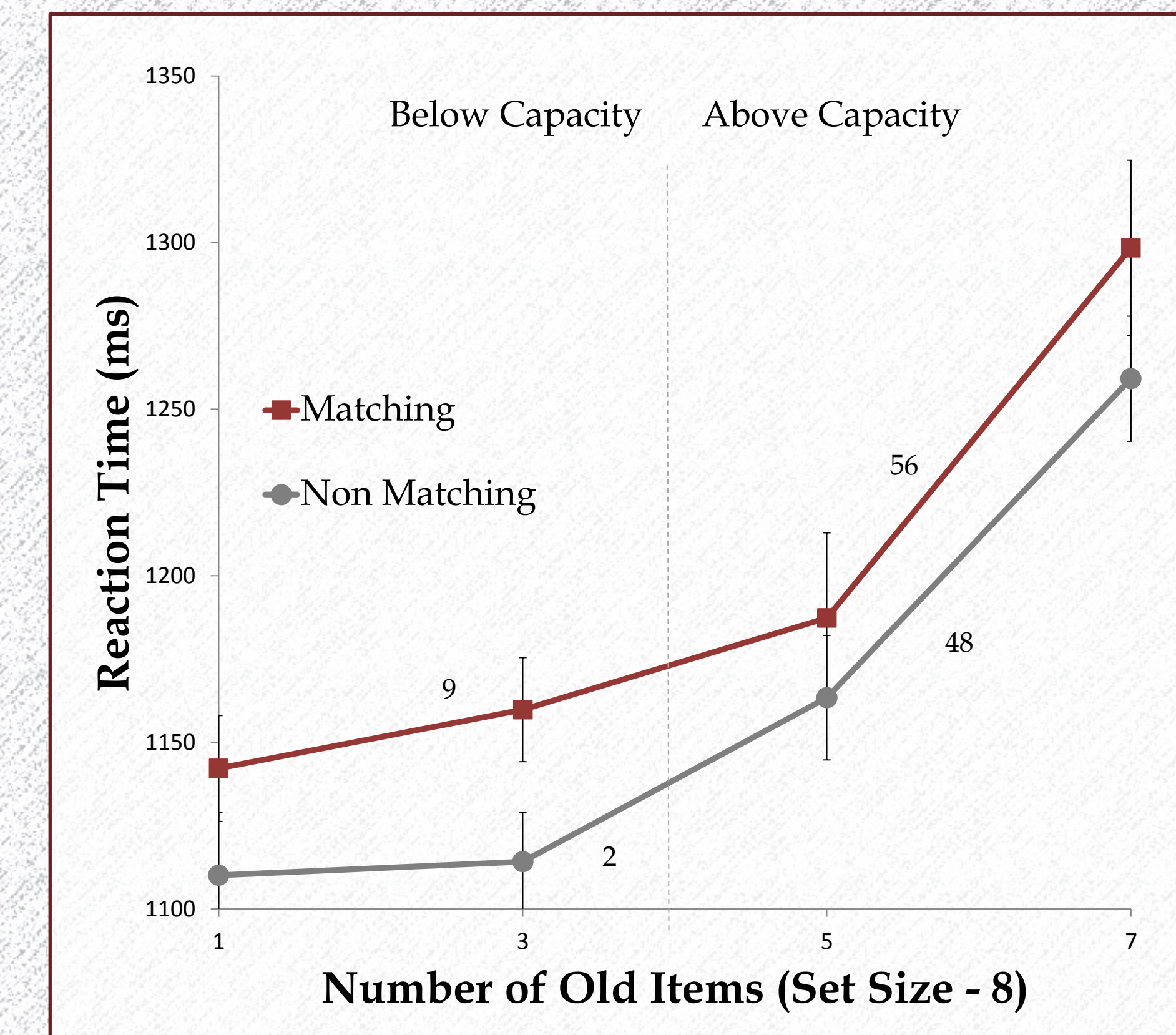
Working memory based preview inhibition is still evident when target is variable (supported by VWM).

Experiment 2

Are items that share features with the target *facilitated*? Evidence from attentional capture.



Set Size: 1, 3, 5, 7 + 8 additional items



Matching distractors capture attention. Simultaneous *facilitation* of stimuli that share features with the target and VWM based *inhibition* of previewed items.

Conclusions

VWM can simultaneously support the inhibition of previewed distractors as well as the facilitation of stimuli resembling a search target:

- Working memory based preview inhibition with a variable target
- Attentional capture of distractors sharing features with variable target template

References

- ¹ Al-Aidroos, N., Emrich, S.M., Ferber, S., & Pratt, J. (2012) Visual working memory supports the inhibition of previously processed information: Evidence from preview search. *JESP: HPP*, 38, 643-663.
- ² Woodman, G.F., Luck, S.J., & Schall, J.D. (2007). The role of working memory representations in the control of attention. *Cerebral Cortex*, 17, 118-124.
- ³ Olivers, C.N.L., Meijer, F., & Theeuwes, J. (2006). Feature-based memory-driven attentional capture: Visual working memory content affects visual attention. *JESP: HPP*, 32, 1243-1265.