Working Memory Removal

What is working memory?

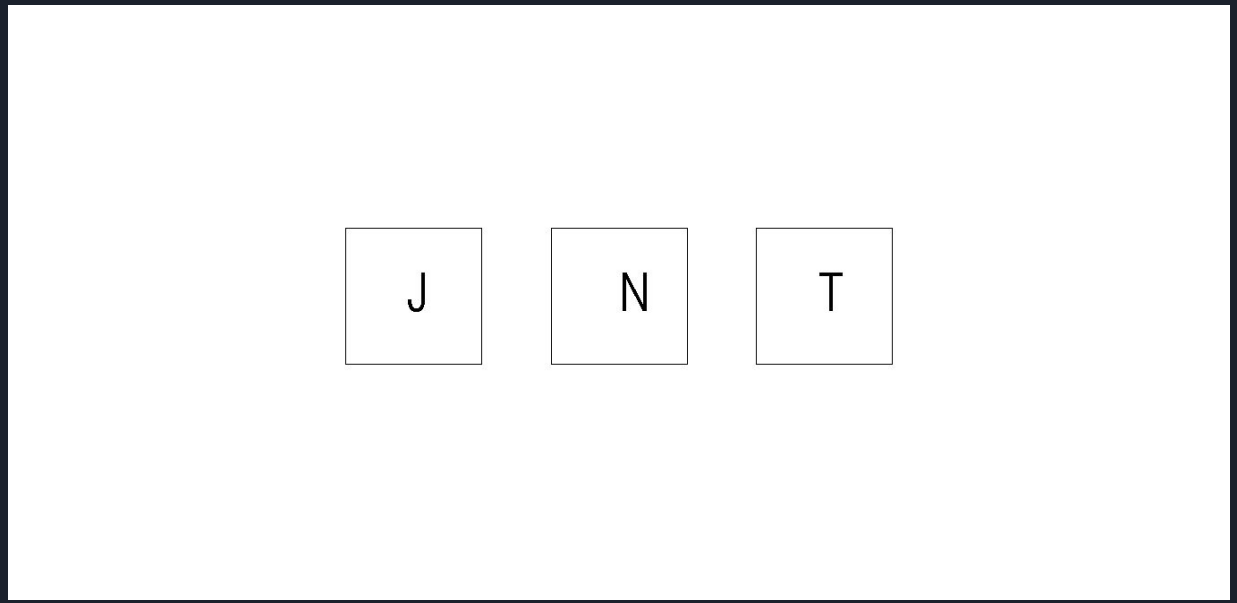
“A capacity-limited system responsible for the temporary maintenance and manipulation of a select set of representations for ongoing cognition”

(Baddeley, 2000)

In order to function within the context of higher-level cognition, working memory needs to create representations that are stable enough to be withheld, while at the same time flexible enough to be adapted to new information.

- Maintenance function: is information in WM lost primarily due to decay or to interference from competing information?
- Updating function: Removal of outdated information and substitution of newer information

Kessler and Meiran (2008) developed a paradigm to measure updating in working memory. The paradigm presented three items that were updated individually in steps and then tested recall. At the end, recall of the final sequence was tested.



Problem:

Since participants don’t know which is the next item to be updated, does this confound updating with general working memory processes such as attention reorienting and coding?

Solution:

Cue presentation of next cue with a red box, and vary the CTI (time between cue and stimulus) to be too short to allow removal on some trials

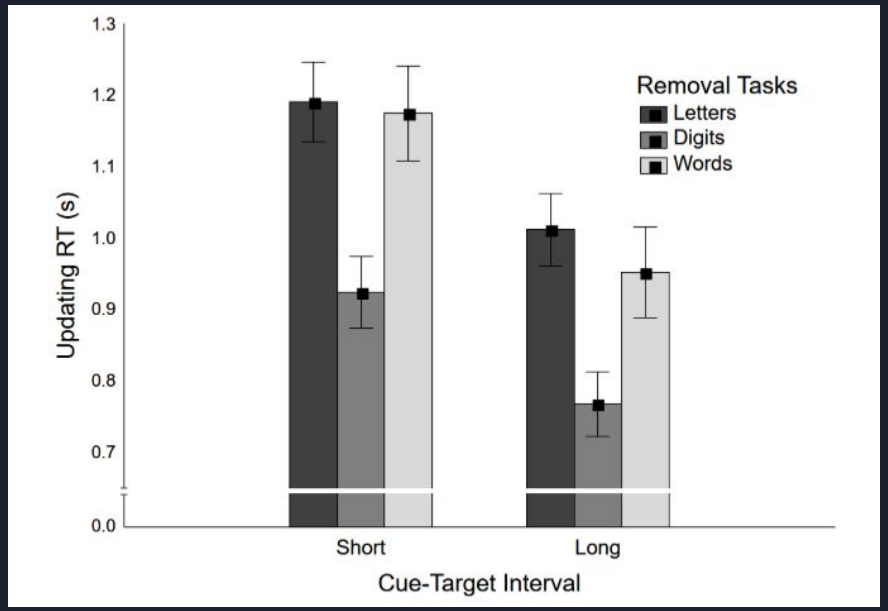
Then compare reaction times between trials which allow enough time for removal and those that don’t

Ecker et al. hypothesized that the short CTI did not allow participants enough time for removal, and therefore an increased reaction time to stimulus encoding would result in these conditions, since removal would take place when the stimulus was presented in addition to encoding

Recall accuracy was expected to be high, and to be used primarily as an exclusion factor when lower than expected

Updated paradigm by Ecker et al.

Three separate versions of the memory updating task with cues and varying CTI were created involving letters, words, and digits. All three showed an effect of CTI, in which the trials with shorter intervals resulted in longer reaction times.



This result serves as evidence for extra working memory load associated with the removal of outdated information