The Precision of Short-Term Memory Items Retained Inside and Outside the Focus of Attention

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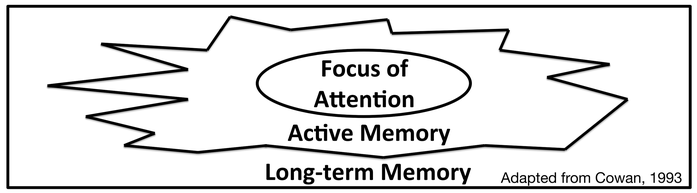
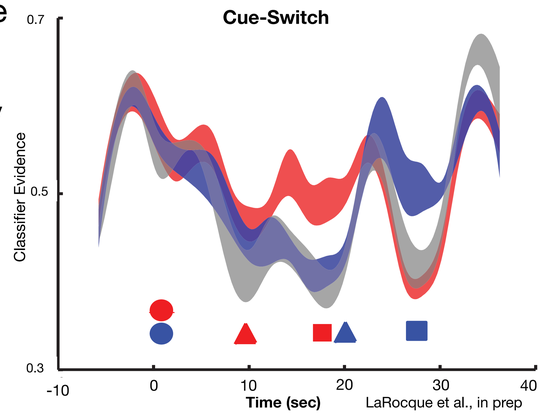
Background

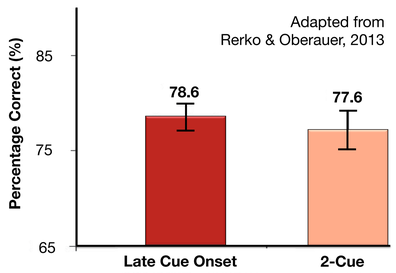
- Recent models of short-term memory (STM) distinguish between information in or out of the focus of attention (FoA).



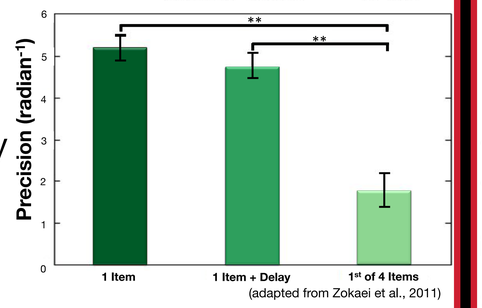
- Neural evidence only present for attended memory items (**AMIs**), but not unattended memory items (**UMIs**).



- Recognition scores equal for AMIs and UMIs

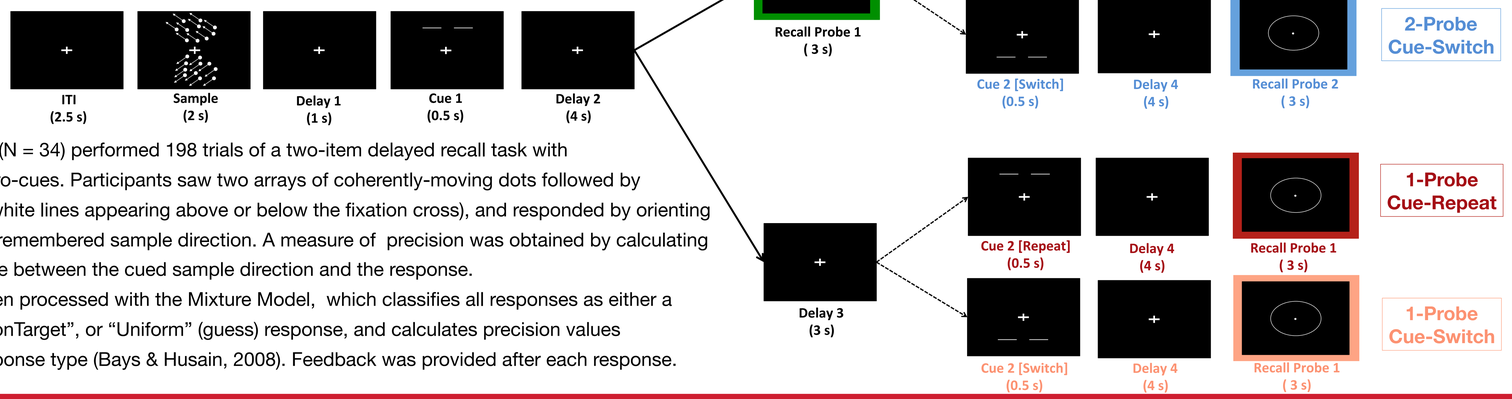


- Precision of memory items in STM is known to decrease as memory load increases.



Do memories retained inside and outside the focus of attention vary in precision?

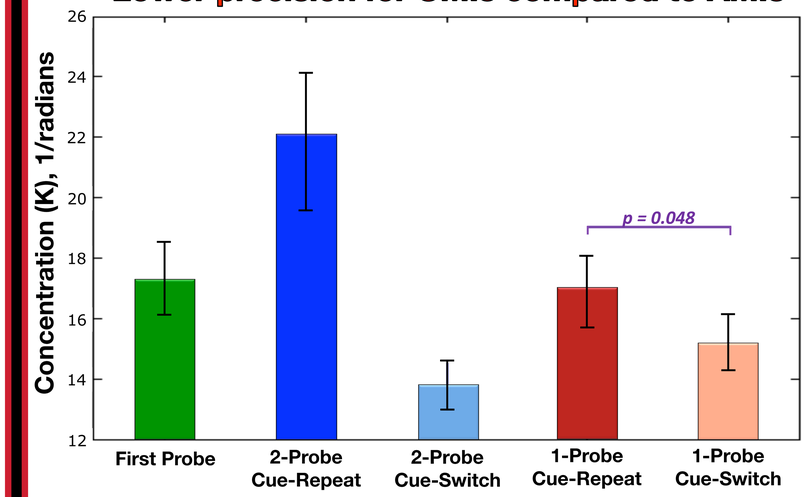
Method / Task



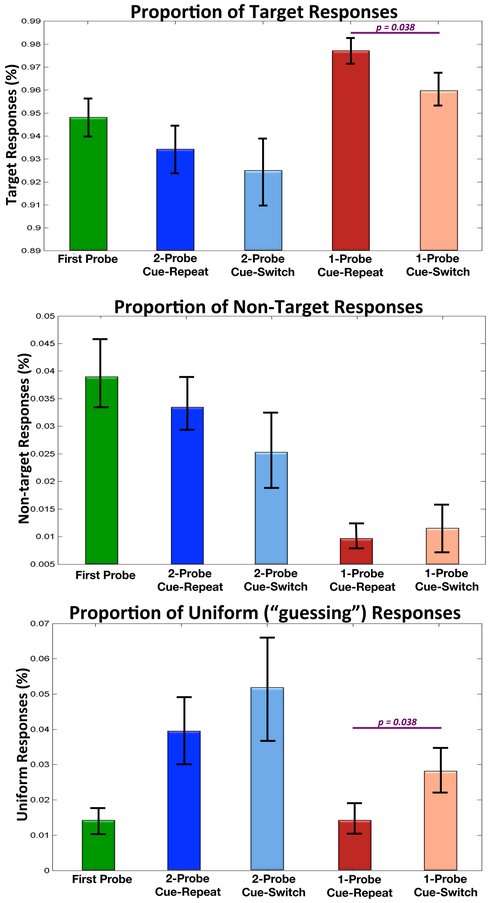
Participants (N = 34) performed 198 trials of a two-item delayed recall task with attention retro-cues. Participants saw two arrays of coherently-moving dots followed by retro-cues (white lines appearing above or below the fixation cross), and responded by orienting a line to the remembered sample direction. A measure of precision was obtained by calculating the difference between the cued sample direction and the response.

Data was then processed with the Mixture Model, which classifies all responses as either a "Target", "NonTarget", or "Uniform" (guess) response, and calculates precision values for each response type (Bays & Husain, 2008). Feedback was provided after each response.

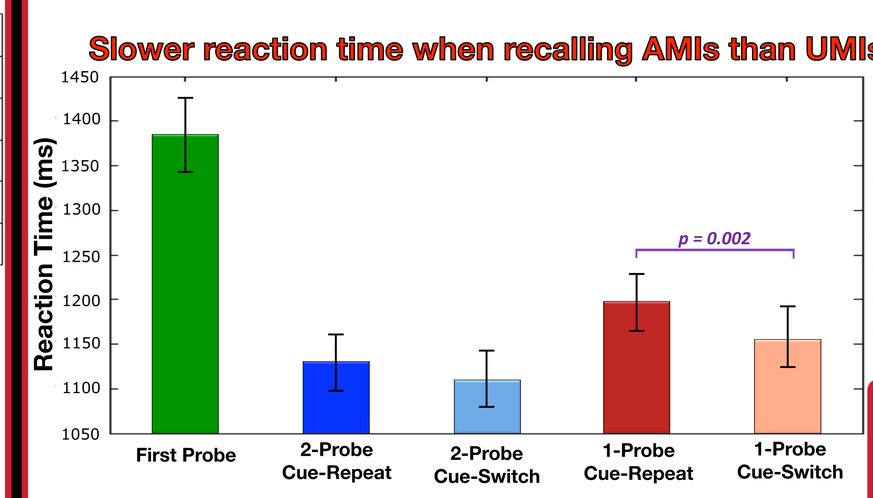
Lower precision for UMIs compared to AMIs



We present precision scores for all conditions; but the main comparison of interest was between Cue-Repeat and Cue-Switch trials in the 1-Probe conditions. This comparison suggests that participants recalled UMIs with less precision than AMIs.



Slower reaction time when recalling AMIs than UMIs



Whereas one would think that rehearsal of the sample would facilitate the recall process, we instead see that participants are faster to respond when recalling previously unattended information (UMIs) compared to content within the FoA

Conclusions

Moving memory items in and out of the internal focus of attention reduces the precision with which they are stored. Current work is focused on understanding the neural bases of these precision gradations.

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