

The role of working memory capacity in visual search and search of visual short term memory

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We can perform goal-directed search for currently visible objects (*visual search*) and for objects recently seen (“Was that an eagle?” *Visual short term memory (VSTM) search*). Observers working memory capacity (WMC) might influence either. In visual search, it could modulate selection by influencing the target template, held in memory. In VSTM search, it could influence the quality of the memory for the stimuli. Observers searched for a specific target among 6 items. Of these, 2 - 4 were from the target category (bird or cake). The other 2 - 4 were from the other category. In visual search, category was precued for 200 msec. After an 800 – 1300 msec delay, the specific target image was shown (200 msec). After another 800 – 1300 msec delay, the search display was shown (200 msec). In VSTM search, the cues were shown after the search display.

Thirteen observers had their WMC assessed using measures adapted from different authors (e.g., Luck and Vogel, 1997). Visual search was much easier than VSTM search (d' : 3.11 vs .76). High WMC observers performed better than low (d' : 2.20 vs. 1.78; $t(11) = 2.496$, $p < .05$). Performance interacted with WMC and the number of items in the target category (setsize). Setsize had a bigger effect on VSTM search performance for low WMC. Curiously, setsize had a bigger effect on visual search performance for high WMC, though low WMC remained worse overall. The results suggest that these two searches may not share the same underlying processes.