Task dependent memory recall performance of naturalistic scenes: *Incidental memorization during search outperforms intentional scene memorization*

Dejan Draschkow[1]*, Melissa L.-H. Võ*[2]*,*
Ray Farmer[3]*, & Jeremy M. Wolfe*[2]

[1]*Ludwig Maximilans University*
[2]*Harvard Medical School, BWH*
[3] *Union College*

Memorizing critical objects and their locations is an essential part of everyday life. In the present study, incidental encoding of objects in scenes during search was compared to explicit memorization of those scenes. Participants were shown 10 different, indoor scenes. 150 objects (15/scene) were preselected. Regions of interest were defined around each object for eye tracking analysis. Observers searched for ten objects in each of five scenes (50 trials, mean RT=3550ms). For the other five scenes, observers spent 15 seconds memorizing as much as possible of each scene for later recall (task order and scenes assignments counterbalanced). We subsequently tested explicit scene memory in two ways. Global scene representation / boundary extension was assessed by showing observers previously-presented scenes and asking if the scene was closer-up or further away than the "original". Detailed scene memory was assessed by asking participants to redraw each of the 10 scenes and their objects. We found no indication of boundary extension for these complex, indoor scenes. Inferences about the scene beyond the image border did not become part of scene memory. Overall, a rather small percentage of the objects were subsequently drawn. Interestingly, even though participants in the search condition were not explicitly asked to memorize the scenes, they reproduced a substantially greater number of objects (22%) compared to the memory condition (11%). This advantage was produced by 29% recall of search targets, which received highest gaze durations (2600ms). Only 9% of all distractors were recalled despite mean gaze durations of 1730ms. Objects in the memorize condition were only looked at for 700ms, but 11% of these objects were recalled suggesting differential, task-dependent encoding strategies. Instructions to search for specific objects produced stronger encoding than the general request to memorize the scene even though the critical objects were repeatedly fixated in both conditions.

Acknowledgements:
This work was supported by ONR N000141010278 to JMW and F32EY022558 to MLV.