What happens if selective attention is occupied while viewing pictures? (e.g. colors, orientations, spatial envelope; Oliva & Torralba, 2001).

Of attended objects and memory for pre-attentive visual properties remember the “gist” of an image, but what is the gist? What processes underlie this ability? It is thought that observers degree of accuracy (Standing, 1973).

Scenes can be identified in 45-135 ms (Potter, 1976; Schyns & Oliva, 1994) and we can remember thousands of rapidly presented scenes with a high degree of accuracy (Standing, 1973).

We hypothesized that “gist” consists of two components: memory for a set of attended objects and memory for pre-attentive visual properties (e.g. colors, orientations, spatial envelope; Oliva & Torralba, 2001). What happens if selective attention is occupied while viewing pictures?

### Experiment One

**Does visual search interfere with picture memory?**

Presented images with a superimposed visual search array for 900 ms to 14 participants.

#### Stimuli

- **Meaningful Scenes**
- **Textures** - images with no attendable objects or layout
- **Shuffled Scenes** - images with intact objects but no layout
- **Shuffled Textures** - images with no attendable objects or layout

**Stimuli**

- **Textures** - images with no attendable objects or layout
- **Shuffled Textures**
- **Scenes**

**Predictions:**

Single task memory for scenes will be superior to textures. Adding a search task should eliminate the component of memory, making scene memory equivalent to textures. Adding a search task should disrupt scene memory while leaving texture memory intact.

#### Results

**Picture Memory during Test Phase**

- Significantly greater interference with visual dual-task
- New Images

**Shuffled Images**

- No greater interference with visual dual-task

In the present experiments the visual search task led to more interference than the auditory task. However, the auditory task was easier than the search task. Future research will replicate these findings using visual and auditory tasks matched for difficulty.

Further conclusions:

- Memory for all stimulus classes was reduced in dual-task conditions. This suggests that selective attention is required for memory consolidation. Hypothesized memory model was not supported.

**GENERAL CONCLUSIONS**

Memory for all stimulus classes was reduced when visual attention was occupied. Hypothesized memory model was not supported.

### DISCUSSION Experiment One

There was substantial dual-task interference on picture recognition for all stimulus types.

Extracting the gist of the scene demands selective attention.

The interference was significantly larger with a visual dual-task than with an auditory dual-task, suggesting a role for visual selective attention.

### DISCUSSION Experiment Two

Given 125 ms to encode images, memory performance in dual-task conditions was still impaired.

Suggests selective attention is required for memory consolidation.

**GENERAL CONCLUSIONS**

Memory for all stimulus classes was reduced when visual attention was occupied. Hypothesized memory model was not supported.

No support for “pre-attentive” picture memory.

Attention is critical for consolidation rather than encoding.

### References


For questions and/or comments contact me at kristin@search.bwh.harvard.edu

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