Visual free recall of real-world scenes reveals high capacity and exquisite detail in memory
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Research over the past several decades has characterized the impressive storage capacity in visual long-term recognition memory and the characteristics of verbal free recall. However, little work has examined the capacity and resolution of visual free recall using a purely visual task, in spite of evidence that recognition and recall may utilize separate neural mechanisms. In the current study, we conducted a quantification and characterization of visual recall for complex real-world images using a visual recall task - drawing. Participants (N=30) studied real-world scene images and, after a distractor task, drew as many images as possible from memory. To serve as benchmarks, separate participants created 1) drawings from the scene category names to estimate the canonical representations of a category, and 2) drawings from each image with no memory component. We leveraged online crowd-sourced experiments on Amazon Mechanical Turk to score these drawings along several properties. Participants' drawings were highly diagnostic of their specific corresponding photographs rather than their scene categories, and the objects they remembered were predictable by graph-based visual saliency maps. Participants remembered 151.3 objects on average across all images, yet drew surprisingly few additional objects (false alarms). Additionally, we find evidence for different mechanisms of recognition and recall, through differences in which images tend to be recalled versus recognized. Overall, these results provide new insight into the capacity and detail with which people recall complex visual images.