

## Object-based attention during scene perception elicits boundary contraction in memory

Two types of boundary transformation, contraction and extension, are equally likely to occur in memory. In extension, viewers will extrapolate information beyond the edges of the image, whereas in contraction, viewers will forget information near the edges of the image. Recent work suggests that the direction of transformation is dependent on image composition. However cognitive factors, such as object-based attention, may also influence how scenes are encoded into memory. Here, participants (N=36) searched for target objects in 15 scenes, while a separate group (N=36) were asked just to memorize the images. Both groups drew the scenes from memory after a delay. Search participants foveated significantly less of the scene (4.48% vs. 6.19%), but spent more time fixating the target. Across the 518 scenes drawn from memory, regression-analyses found that participants engaged in search were more likely to draw targets, and for both groups, object size was highly predictive of recall. However, only search drawings had a significant tendency to show boundary contraction, with 64.66% of drawings showing contraction and 28.6% showing extension, compared to 41.81% of memorize drawings showing contraction and 47.8% showing extension. These results are especially dramatic given that participants studied the same images in both conditions for roughly the same amount of time. Contraction took the form of a “zoom-in” effect in the search drawings – while targets were drawn in the accurate location, the point of view was zoomed in on the target so that it was drawn significantly bigger than it originally appeared, and the farther an object was from the target, the less likely it was to be remembered. These results support the recently proposed dynamic-tension model (Park et al., 2021), suggesting that both cognitive factors, like attention, and static properties, like image composition, may influence whether a scene contracts or extends in memory.