Visual Short-Term Memory for Abstract Patterns: Explored with a Local Recognition Task and a Change-Detection Task

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The present study investigated visual short-term memory for abstract patterns with two different paradigms: A local recognition task (Exp. 1) and a change-detection task (Exp. 2). Experiment 1 adopted a local recognition task to test whether pattern symmetry, element scatteredness, and probe location would affect the accuracy of visual recognition memory. The results on group accuracy and response time revealed significant and robust main effects for symmetry, element connectedness, and probe quadrant, showing that the memory was more accurate and faster when the pattern was symmetrical, had a higher connectedness, and was more error-prone for probes located in the low-right quadrant. In Experiment 2, we tested the same effects with a change-detection task that encourages subjects not only memorize local parts but also the whole pattern. The results also showed significant main effects for symmetry, element connectedness, and the changing quadrant. As compared to Experiment 1, the symmetry advantage in the change-detection task was augmented while the effect of element connectedness was decreased. Taken together, our study suggests that the representations in visual short-term memory are robustly affected by global (symmetry) and local complexity (element connectedness), but the weights can be flexibly adjusted according to the task demand.

Keywords: *change-detection task, local recognition task, perceptual complexity, symmetry, visual short-term memory*