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Individual Differences in Working Memory Capacity Are Unrelated to the Magnitude of Benefits from Object- and Dimension-Based Retro-Cues

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Footnotes

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Abstract

Previous studies have associated visual working memory (VWM) capacity with the ability to use internal attention. Internal attention's effect on VWM has been studied mostly using object-based retro-cues, which can direct internal attention to particular objects. In addition, by using dimension-based retro-cues recent studies have found that directing internal attention to a feature dimension in VWM can improve memory recall performance. Although the mechanism of object-based retro-cues has been studied for over ten years, no study to date has investigated the relationship between VWM capacity and the benefits of dimension-based retro-cues. The present study aims to explore individual differences in VWM capacity and their relationship with the use of dimension- and object-based retro-cues. We first measured participants' VWM capacity and then asked them to conduct a dimension-based cue task and an object-based cue task. We found that

performed better than low-VWM-capacity participants in both dimension- and object-based cue tasks. In addition, although we identified certain RCBs obtained from both dimension- and object-based cues, we did not find any significant correlation between individual VWM capacity differences and the magnitude of the RCB obtained from object- or dimension-based cues. These results suggest that VWM capacity is not related to RCBs' magnitude, and thus VWM storage and the use of internal attention are independent mechanisms. Moreover, we found that the participants who benefitted the most from object-based retro-cues also benefitted the most from dimension-based retro-cues in color reports; however, this pattern was not found in the orientation report trials. This finding suggests a partly overlapping mechanism between the use of the two retro-cue types. The present study provides the first evidence of the relationship between VWM capacity and the dimension-based internal attention process.