**The efficiency of memory search depends on categorical target-distractor similarity**

Linlin Shang, Yuan-Fang Zhao, Marius V. Peelen

Donders Institute for Brain, Cognition and Behavior; Radboud University

Funding acknowledgements: This project has received funding from the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme (grant agreement No. 725970).

During memory search, a single visually presented item is compared against multiple items in memory. Memory search can be considered the inverse of visual search, in which a single memory item is compared against multiple visually presented items. Previous research has shown that memory search time increases logarithmically with memory set size, unlike visual search, where the relationship with visual set size is linear. Here, we test how the relationship between memory set size and reaction time (RT) depends on the categorical similarity between target (memorized) and distractor objects, both in short- and long-term memory tasks. Participants memorized 1, 2, 4, or 8 objects, all from one category (animate or inanimate). Subsequently, they performed an old/new recognition task, in which they had to indicate, for each object, whether it was part of the memory set. Analyses focused on RT to new (distractor) objects, which made up 80% (Experiment 1) or 50% (Experiment 2) of the presented objects. Importantly, half of the distractors were from the same category as the memorized set, and half were from the other category. Across conditions, results showed that reaction time (RT) varied logarithmically with set size. However, the slopes differed significantly between conditions, with steeper slopes for within-category than between-category distractors. Nearly identical results were found for long-term (Experiments 1 and 2) and short-term (Experiment 3) memory search. These results demonstrate that the efficiency of memory search depends on the categorical similarity between targets and distractors.