Macaque monkeys categorize images by their ordinal number

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Abstract:

The recall of a list of items in a serial order is a basic cognitive skill. However, it is unknown whether a list of arbitrary items is remembered by associations between sequential items or by associations between each item and its ordinal position. Here, to study the nonverbal strategies used for such memory tasks, we trained three macaque monkeys on a delayed sequence recall task. Thirty abstract images, divided into ten triplets, were presented repeatedly in fixed temporal order. On each trial the monkeys viewed three sequentially presented sample stimuli, followed by a test stimulus consisting of the same three images and a distractor image (chosen randomly from the remaining 27). The task was to touch the three images in their original order without touching the distractor. The most common error was touching the distractor when it had the same ordinal number (in its own triplet) as the correct image. Thus, the monkeys' natural tendency was to categorize images by their ordinal number. Additional, secondary strategies were used eventually to avoid the distractor images. These included memory of the sample images (working memory) and associations between sequence triplet members. Thus, monkeys use multiple mnemonic strategies according to their innate tendencies and the requirements of the task.

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