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JEP: Human Perception and Performance

JEP: Learning, Memory and Cognition

Journal of Comparative Psychology

JEP: General

JEP: Animal Learning and Cognition

Behavioral Neuroscience

Particularly Exciting Experiments in Psychology (PeePs) is a free summary of ongoing research trends common to six APA

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WHAT DO WE SEE WHEN WE SEE SHAPE?

A remarkable aspect of human vision is our ability to recognize familiar objects across variations in size, viewpoint, and lighting. Moreover, people can recognize objects at different levels of classification: An object might be identified as a vehicle, a car, or a Honda Civic. However, little is known about the contribution of basic image-based features (e.g., curvature) as opposed to semantic features (e.g., wheels) in these visual recognition processes.

Davitt et al. (2013, *JEP:HPP*) used eye tracking with novel objects to probe the role of shape-based features in object recognition and categorization. Participants were trained to recognize novel objects at either the basic (e.g., "car") or the subordinate (e.g., "Honda Civic") level. After training, they were tested on a sequential matching task, in which they were asked to determine whether two objects belonged to the same category (basic-level classification group) or were the same individual (subordinate-level classification group). Fixation patterns during the sequential matching task were compared against three algorithmically generated models based on either external-convex regions, external-concave regions, or internal part boundaries. Results showed fixation preferences for internal part boundaries and for concave over convex contours in both tasks. However, saccade amplitudes were shorter in basic- versus subordinate-level matching. These results suggest that although the same shape representations mediate basic- and subordinate-level recognition, the type of categorization task constrains the speed with which information in those representations is sampled.

Object shape features are important for recognizing objects. However, it may be useful to extract other information besides that required for identification from object shape. For example, when one is trying to cross a busy street, it is certainly important to recognize the objects on the street as cars, but it is arguably more important to recognize their direction and speed of motion. Processing dynamic input requires using the current state of the environment to predict where important objects will be in the future. Sigurdardottir, Michalak, and Sheinberg (2014, *JEP:G*)hypothesized that such inferences might be facilitated by information from object shapes. They found that the shape of novel objects reliably cued directionality, and this information was automatically used to guide the allocation of attention. For example, participants were quicker to detect targets when the directionality of a central novel object pointed to the target's location. Directionality derived from object shape also influenced eye movements. When participants were asked to simply follow a row of moving shapes journals that focus on experimental psychology.

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with their eyes, tracking was faster and more accurate if the shape of the objects being tracked cued directionality that matched the actual direction of motion. Unlike in Davitt et al., participants received no prior training with the novel objects, suggesting that directionality is extracted from object shape and used automatically in the absence of prior experience.

Related reading: Object shape influences the relationship between object size and perceived rotational speed (Blair et al., 2014, *JEP:HPP*).

Other interesting reading: Experimental parameters influence conclusions about visual working memory. Proactive interference when the same objects are used across trials limits estimates of visual working memory capacity (Endress & Potter, 2013, *JEP:G*). Whether memory items are presented simultaneously or sequentially influences rates of forgetting from working memory because of differences in the time available for consolidation (Ricker & Cowan, 2014,*JEP:LMC*).