

From: American Psychological Association

Date sent: 02/13/2014 10:02:06 am

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Particularly Exciting Experiments in Psychology (PeePs) is a free summary of ongoing research

SCENE GIST IN THE BLINK OF AN EYE

People can determine the semantic content of a scene—beach, bedroom, person raking leaves—within a single fixation, via a process known as *scene gist recognition*. Because relevant information may appear in different locations depending on whether a scene is a mountain or a busy street, rapid extraction of scene gist facilitates attentional selection and object recognition.

Although rapid scene gist recognition has been established in a number of studies, how visual processing unfolds over time and space during a single fixation remains unknown. [Larson et al. \(2013, JEP:HPP\)](#) presented participants with scene images in either a window (circular viewable region encompassing the central portion of the scene) or a scotoma (where the central window is blocked out and only peripheral information is presented). These were presented very rapidly (24 ms) and followed by a mask after a variable interstimulus interval (ISI). Participants had to then decide whether a basic-level category label (e.g., *beach*) matched the image. Critically, ISIs were chosen such that visual processing would be truncated within the time frame of a single fixation, allowing the authors to investigate the time course of processing within this very short time period. They found that there was an advantage for the window condition relative to the scotoma condition, but only during the first 100 ms of processing, suggesting that processing basic-level scene gist begins in central vision and expands outward to include peripheral visual information over time. However, this early advantage for window images was abolished when participants' attention was strategically allocated to the periphery by including a greater proportion (80%) of



Window **Scotoma**
Example of a scene image in the window and scotoma conditions used by Larson et al. (2013, *JEP:HPP*). From "The Spatiotemporal Dynamics of Scene Gist Recognition," by A. M. Larson, T. E. Freeman, R. V. Ringer, and L. C. Loschky, 2013, *Journal of Experimental Psychology: Human Perception and Performance*, advance online publication, p. 4. Copyright 2013 by the American Psychological Association.

trends common to six APA journals that focus on experimental psychology.

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scotoma images in the experiment. The authors interpret this result as support for the idea that the central-to-peripheral nature of gist extraction reflects expansion of covert attention within the first eye fixation on a scene.

The same factors that make rapid scene gist recognition advantageous in humans also apply to other animal species. For example, detecting scene gist could provide a survival advantage by allowing rapid detection of predators or food items within a scene. Perhaps not surprisingly, then, [Kirkpatrick et al. \(2013, JEP:ABP\)](#) found that pigeons were able to rapidly categorize scenes on the basis of gist. Pigeons were trained to discriminate between two basic-level (beaches vs. mountains) or superordinate-level (natural, e.g., beaches, vs. manmade, e.g., streets) scene categories. Learning in both cases generalized to new scene images, demonstrating that pigeons learned the category discrimination and not the specific training images. It is important to note that pigeons were able to discriminate scene gist with high accuracy when images were presented for durations as rapid as 350 ms, and performance was above chance for presentation durations of 100 ms. Although this is an order of magnitude longer than the presentation time required for scene gist processing in humans (20–25 ms), fixation durations in pigeons are also an order of magnitude longer than human fixation durations. In other words, pigeons may still be processing scene gist within a single fixation, just like humans.

One interesting question is whether the ability to recognize scene gist in a single fixation in birds and humans is based on shared ancient brain structures or whether selective pressures in the environment influenced both species to develop this ability independently, using different brain structures.

Other interesting reading: Motor simulation is involved in understanding a speaker's gestures ([Ping et al., 2014, JEP:G](#)) and a character's linguistic actions during reading ([Gunraj et al., 2013, JEP:LMC](#)).

Journal of Experimental Psychology: Animal Behavior Processes is now *Journal of Experimental Psychology: Animal Learning and Cognition*. Read more about this change in the editorial by [Ralph Miller \(2014, JEP:ALC\)](#).

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