

Owl study expands understanding of human stereovision

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Using owls as a model, a new research study reveals the advantage of stereopsis, commonly referred to as stereovision, is its ability to discriminate between objects and background; not in perceiving absolute depth. The findings were published in a recent *Journal of Vision* article, Owls see in stereo much like humans do.

The purpose of the study, which was conducted at RWTH Aachen (Germany) and Radboud University (Nijmegen, Netherlands), was to uncover how [depth perception](#) came into existence during the course of evolution.

"The reason why studying owl vision is helpful is that, like humans, [owls](#) have two frontally placed eyes," said author Robert F. van der Willigen, PhD, of Donders Institute for Brain, Cognition and Behavior at Radboud. "As a result, owls, like humans, could appreciate the 3-dimensional shape of tangible objects through simultaneous comparison of the left and right eye."

van der Willigen studied two trained barn owls (*Tyto alba*) by conducting a series of six behavioral experiments equivalent to those used on humans. He used computer-generated binocular random-dot patterns to measure stereo performance, which showed that the owl's ability to discriminate random-dot stereograms is parallel to that of humans despite the owl's relatively small brain. The results provided unprecedented data on stereovision, with findings that debunk the long-held consensus that the [evolutionary advantage](#) of seeing in stereo must

be depth vision.

He contends the findings demonstrate that while binocular disparity, the slight difference between the viewpoints of the right and left eyes, does play a role in perceiving depth, it allows owls, like humans, to perceive relative depth rather than absolute distance. "It is useful, therefore, not so much in controlling goal-directed movements as it is in recognition."

In looking at future studies, van der Willigen hopes that scientist will consider that human or primate vision is not the only way to examine the stereovision experience. "My present work on the owl highlights underappreciated, but fundamental aspects of stereopsis," he says. "Nonetheless, final proof should come with behavioral demonstration of equivalent stereoscopic abilities in animals other than the owl. Hopefully, my current work will encourage scientists to investigate other animal species."

Provided by Association for Research in Vision and Ophthalmology

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