

# Psychology researchers extend knowledge of visual misperception

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Using abstract images instead of real photographs, University of Georgia researchers are one step closer to understanding visual misperceptions and discovering just why people experience a phenomenon known as boundary extension.

Boundary extension happens when someone takes a look at a scene, glances away and remembers seeing a more wide-angle view than was actually present. In just a few short seconds, the [human brain](#) helps most people extend the scene beyond what is actually seen.

Scientists at the University of Delaware discovered this concept in 1989 when they showed study participants real photographs of 20 scenes for 15 seconds and then had participants draw a picture of what they'd viewed. Ninety-five percent of the drawings included information that wasn't physically present but would have been just outside the camera's field of view.

This phenomenon has been consistently demonstrated since that time, but researchers have not been able to explain why it occurs.

James Brown, an associate professor in the Franklin College of Arts and Sciences department of psychology, and graduate students Benjamin McDunn and Aisha Siddiqui decided to study whether the use of an abstract image—instead of a photograph—would produce different results.

They found that showing subjects geometrical images on random-dot or white backgrounds had similar results. The study was published recently in the journal *Psychonomic Bulletin & Review*.

"This study is consistent with many areas of perception, demonstrating the natural tendency for our perceptual systems to go beyond, fill in and extrapolate from the current sensory input," Brown said. "Here we show this tendency as it relates to scene perception. Even with completely novel 'scenes' where we have no experience with or knowledge about them, we still tend to extrapolate beyond what was originally seen when our memory is tested soon after viewing them."

Familiarity with an environment or an object may have much less of an effect than was previously thought on whether or not people remember viewing things through a wide-angle lens.

"The most valuable finding is support for the idea that boundary extension is likely happening constantly during our perception of close-up views of the world, regardless of context," he said. "We showed evidence that people may be automatically priming themselves with expectations of what lies just outside their current view even with images depicting an unrealistic and abstract setting. This suggests that our familiarity with an environment doesn't have as much effect on whether or not extension occurs as current theory would have expected."

McDunn, who completed his master's degree in psychology earlier this year, is now working on his doctorate and continuing his study of this concept.

"Subtracting out different pieces of the puzzle—conceptual knowledge of view and object recognition—has helped tease out key characteristics of our ability to make sense of the world visually," he said.

For Brown and his team, "the real challenge has been finding different kinds of stimuli that don't elicit [boundary extension](#)," he said. "Doing so will help establish the parameters of the effect and, hopefully, lead to a better understanding of its causes."

McDunn and Brown are now examining spatial perception by constructing a study in which participants view scenes depicting the real world—with similar object features such as size and spatial attributes—to see if the phenomenon exhibits with the same pattern.

"Spatial vision in general is somewhat enigmatic and difficult to study in isolation," McDunn said. "Boundary extension may provide a means of determining what characteristics of a stimulus cause us to perceive it as depicting space."

While researching spatial vision is difficult, Brown said, it's important to understand more about how people see the world.

"Boundary extension," he said, "seems to be strongly tied to our perception of a continuous spatial expanse around us, knowing a given view depicts a truncated portion of the world, a characteristic that is common to all scenes in the real world."

**More information:** [www.ncbi.nlm.nih.gov/pubmed/23921509](http://www.ncbi.nlm.nih.gov/pubmed/23921509)

Provided by University of Georgia

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