Study illuminates human's unique ability to perceive a scene

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What we see and understand about the visual world is tightly tied to where our eyes are pointed. In an article in the August issue of *Current Directions in Psychological Science*, a journal of the Association for Psychological Science, University of Edinburgh psychologist, John Henderson discusses current approaches and new empirical findings that are allowing investigators to unravel how human gaze control operates during active real-world scene perception.

Gist theory of psychology explains how humans are able to apprehend the full context of a scene merely be glancing at it. Research on this unique human ability has also shows that when looking at a scene, viewers move their eyes through several different fixation points.

Previous research shows that fixation is critical for perceptual and cognitive processing during scene perception. But, what drives our gaze? There are two theories to explain how we get the gist of a scene. A good deal of research has been devoted to studying whether fixation is "pulled" by the stimulus or "pushed" by cognitive processes.

Henderson explains that "we can think of fixation as either being 'pulled' to a particular scene location by the visual properties at that location, or 'pushed' to a particular location by cognitive factors related to what we know and what we are trying to accomplish."

Human gaze control is intelligent in that it draws not only on currently available visual input but also on cognitive knowledge structures, including short-term and episodic memory for the current scene. For example, where would you look if you wanted to know the time? You would not look at the brightest or the most colorful thing in your visual field, but rather the location likely to provide the time (like your wrist or a clock on the wall). This implies that gaze control draws on stored knowledge structures, which must somehow be integrated with a representation of the specific image that is currently in view.

Henderson also points out that much of what we know about scene perception comes from the study of photographs, which are static and, ultimately, "stand-ins for the real environment. Future research in this domain will focus on how active scene perception operates in the real world itself.