Medical Xpress

New study suggests the brain predicts what eyes in motion will see

August 25 2009

When the eyes move, objects in the line of sight suddenly jump to a different place on the retina, but the mind perceives the scene as stable and continuous. A new study reports that the brain predicts the consequences of eye movement even before the eyes take in a new scene.

The study, "Looking ahead: The perceived direction of gaze shifts before the eyes move," published in the Association for Research in Vision and Ophthalmology's peer-reviewed *Journal of Vision*, asked subjects to shift their eyes to a clock with a fast-moving hand and report the time on the clock when their eyes landed on it. The average reported time was 39 milliseconds before the actual time. As a control task, the clock moved instead of the eyes, and the reported arrival times averaged 27 milliseconds after the actual time.

"We've revealed a moment in time when things are not perceived as they actually are," said lead researcher Amelia Hunt, PhD, of the University of Aberdeen's School of Psychology. "These findings serve as a reminder that every aspect of our experience is constructed by our brains."

The report suggests that the prediction is a result of remapping, where neurons involved in visual perception become active or dormant to help the brain maintain a stable visual environment despite the constant shift of images on the retina.

According to the report, "Remapping allows locations to be continuously represented across the eye movement by maintaining both current and expected locations simultaneously, facilitating the transition between the two." Hunt added: "The finding implies that we experience the predicted consequence of an eye movement as though it is actually occurring, albeit just for a moment."

Hunt said the research might lead to more investigation of the brain's ability to predict and its role in perception, as well as the link between brain activity and actual experience. The next step may be to examine under what circumstances predictive processes occur, what function they serve and to what degree they influence our perception of events, she said.

Source: Association for Research in Vision and Ophthalmology (news : web)