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Microsaccades are indeed responsible for most of our visual experience

By St. Joseph's Hospital and Medical Center
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For more than 40 years, a scientific controversy has raged over whether microsaccades, rapid eye movements that occur when a person's gaze is fixated, are responsible for visibility.

Research conducted at Barrow Neurological Institute in Phoenix has recently resolved the debate, establishing that microsaccades are indeed responsible for driving 80 percent of our visual experience.

Even when eyes are fixated carefully on an object, they continue to make tiny movements called fixational eye movements. These movements cause nearly constant stimulation of the retina. "If our eye was perfectly still during fixation, the world would quickly fade from view due to the fact that the neurons in our eyes and brain quickly adapt to non-changing stimulation," said lead researcher Dr. Susana Martinez-Conde.

There are three types of fixational eye movements: microsaccades, which are fast movements that travel in a straight line; drifts, which are slow curvy motions that occur between microsaccades; and tremors, which are very fast, extremely small oscillations of the eye superimposed on drifts.

"It is critical that we know which of these fixational eye movements is primarily responsible for keeping the world from fading because in normal visual conditions we fixate our gaze 80 percent of the time," said Dr. Martinez-Conde. Her lab established the vital role of microsaccades in vision by measuring fixational eye movements in subjects whose gaze was concentrated on one object.

Not only does this new discovery resolve a scientific debate, it also brings new hope to patients who are blind much of the time due to fixational eye movement problems.

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