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Brain repositions eyeballs during blink: study

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New research led by the University of California, Berkeley, shows that when our eyelids automatically shutter and our eyeballs roll back in their sockets every few seconds, our brains repositions our eyeballs so we can stay focused on what we're viewing.

When our eyeballs roll back in their sockets during a blink, they don't always return to the same spot when we reopen our eyes. This misalignment prompts the brain to activate the eye muscles to realign our vision, said study lead author Gerrit Maus, an assistant professor of psychology at Nanyang Technological University in Singapore, who launched the study as a postdoctoral fellow in UC Berkeley's Whitney Laboratory for Perception and Action.

"Our eye muscles are quite sluggish and imprecise, so the brain needs to constantly adapt its motor signals to make sure our eyes are pointing where they're supposed to," Maus was quoted as saying in a news release from UC Berkeley. "Our findings suggest that the brain gauges the difference in what we see before and after a blink, and commands the eye muscles to make the needed corrections."

In a related experiment, a dozen healthy young adults sat in a dark room for long periods staring at a dot on a screen while infrared cameras tracked their eye movements and eye blinks in real time.

Every time they blinked, the dot was moved one centimeter to the right. While study participants failed to notice the subtle shift, the brain's oculomotor system registered the movement and learned to reposition the line of vision squarely on the dot.

After 30 or so blink-synchronized dot movements, the participants' eyes adjusted during each blink and shifted automatically to the spot where they predicted the dot to be.

From a big-picture perspective, researchers said, if we didn't possess this oculomotor mechanism, particularly when blinking, our surroundings would appear shadowy, erratic and jittery.

"We perceive coherence and not transient blindness because the brain connects the dots for us," said David Whitney, a psychology professor at UC Berkeley and co-author of the study published Thursday in the online edition of the journal Current Biology.

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