How our brains can track a 100 mph fastball

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By Denise Chow

LiveScience (http://www.livescience.com/)

When a baseball player hits a home run off a 100-mph fastball, how can the slugger's brain track such a fast-moving object? Scientists may now have the answer.

In a new study, they discovered how the brain can predict the path of a moving object, even one traveling so fast humans can barely see it.

Vision scientists at the University of California, Berkeley, studied how the brain processes visual information, and located the specific region of the brain (http://www.livescience.com/29230-aging-controlled-by-brain.html) responsible for calculating where a moving object will most likely end up.

Al Behrman / AP

Barry Larkin could see a baseball. He spent his entire major league career with the Cincinnati Reds from 1986-04 and hit .295 with 198 home runs, 960 RBIs and 2,340 hits..

When human eyes see an object, it takes one-tenth of a second for the brain to process that information, said Gerrit Maus, a postdoctoral fellow in psychology at UC Berkeley, and lead author of the new study detailed Wednesday in the journal Neuron. So how does the brain compensate for the slight delay? [10 Odd Facts About the Brain (http://www.livescience.com/12916-10-facts-human-brain.html)]

"The brain does not think the object is in the position where the eye tells us it (that it) is," Maus told LiveScience. "The object is shifted forward in the direction that it's moving, so we're actually predicting where things are going to be."

This means the brain perceives moving objects to be farther along in their trajectory than what a person actually sees with their eyes, he explained.

"The fundamental problem is that our brain doesn't work in real-time," Maus said. "The brain actually works rather slow, compared to some electronics or computers that we have today. Information that the brain receives from the eye is already out of date by the time it gets to the visual cortex."

Maus and his colleagues studied the brains of six volunteers using functional magnetic resonance imaging (fMRI), which indirectly measures brain activity (http://www.livescience.com/27721-brain-activity-map-project-launch.html) by measuring changes in the blood flow in the brain.

The volunteers' brains were scanned as they watched an illusion called the "flash-drag effect," in which brief flashes of light shift over a moving background.

"The background is moving at the same time, so we perceive the flash being dragged along by the motion," Maus explained. "The brain interprets the flash as part of the moving background, and therefore engages the prediction mechanism to shift the position of the flash."

In another part of the exercise, the light flashes over a still background. When the scientists compared the patterns of neural activity (http://www.livescience.com/13262-researchers-crawl-neural-network.html), they found that in both cases, the activity occurred in a region called V5, which is located in the middle temporal region of the visual cortex — an area at the back of the head and to the side.

This suggests that the V5 region is involved in tracking moving objects, pushing them along in their trajectories so that a person, such as a baseball player hoping to hit a fastball, is not constantly processing out-of-date information, the researchers said.

"What we perceive doesn't necessarily have that much to do with the real world, but it is what we need to know to interact with the real world," Maus said.

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Get hit by an incoming one a time or two. You'll probably learn to track them pretty quick.

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Are there any posts where some whiny @!$%# doesn't spout off on Obama or Republicans? My goodness, keep it relevant or go listen to more talk radio.

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Both steroids and HGH can improve this process (and therefore hand-eye coordination) by speeding up the processing in the vsual cortex. It is why so many baseball players and people like Tiger Woods were doping. What I have found interesting is that when steroids/HGH are discontinued, the hand-eye coordination does not return to what it was

before, but drops well below that point. It takes a couple of years for the visual cortex to return to normal. But many athletes start doping when they feel themselves starting to slip because of age. They do better while doping, but then drop off when the doping is stopped. But they never really return to where they would have been without the doping because age is causing decline faster than the return from what is called "steroid rebound."

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Doug950479 (http://doug950479.news/2013/05/03/#3.g(http://science.nbcnews.com/_news/2013/05/03/18129836-how-our-brains-can-track-a-100-mph-fastball?lite#th3720226-c76122969)

If that's true, they should permit steroids in baseball. But only for umpires.

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#4 Ellen Henegar (http://ellenhenegar.news/2013/05/03/#4(http://science.nbcnews.com/_news/2013/05/03/18129836-how-our-brains-can-track-a-100-mph-fastball?lite#th3720226-c82061449)

When I studied voice lessons, my teacher asked me to turn away from the piano, listen for the note, and then reproduce it. I was able to do this very quickly. He said that I Hear Fast. Later I went to the movies with a friend to see a musical. I hummed all the tunes throughout the movie. My friend accused me of having seen the movie before. I said No. I just hear fast. My teacher said that I could probably fake people out making them think that I already knew the music. It's been a lot of fun over the years. It drives people crazy. Something tells me that Seeing "fast" is maybe related to also Hearing "fast." Something to ponder. Thank you. Ellen Henegar. Anybody else See or Hear fast?? What does it feel like for you???

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