

Brain scientist continues exploring the brain

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A Montana State University assistant professor in neuroscience is part of a team that has made progress understanding how the brain processes visual information. In addition to adding to the basic understanding of brain function, the research may also have implications for understanding schizophrenia and attention deficit disorders.

MSU's Behrad Noudoost was a co-author with Marc Zirnsak and other neuroscientists from the Tirin Moore Lab at Stanford University in publishing a recent paper on the research in *Nature*, an international weekly journal for natural sciences.

Noudoost and the team studied saccadic eye movements—those movements where the eye jumps from one point of focus to another—in an effort to determine exactly how this happens without us being overcome by our brains processing too much [visual information](#).

To introduce the study, Noudoost first gets his audience to think about eye movements at the most basic level. "Look in the mirror and stare at one eye," Noudoost said. "Then look at the other eye. We are essentially blind during eye movement as we cannot see our eyes move, even though we know they did."

According to Noudoost, scientists have been trying to learn exactly how the [brain](#) processes these visual stimuli during saccadic eye movement and this research offers new evidence that the [prefrontal cortex](#) of the brain is responsible for visual stability.

"Visual stability is what keeps our vision stable in spite of changing input. It is similar to the stabilizer button on a video camera," Noudoost said.

"We wanted to know what causes the brain to filter out un-necessary information when we shift our vision from one focal target to another," Noudoost said. "Without that filter the visual information would overwhelm us."

According to the scientists, the study offers evidence neurons in the prefrontal cortex of the brain start processing information in anticipation of where we are going to look before we ever do it, suggesting that selective processing might be the mechanism for visual stability.

Noudoost said this new information can help scientists better understand the underlying causes of problems such as dyslexia and attention deficit disorders.

According to Frances Lefcort, the head of the Department of Cell Biology and Neuroscience, the team's basic research may have implications for understanding a myriad of mental health issues.

"Schizophrenia and [attention deficit](#) disorders have been linked to visual stability, so the work Behrad is doing offers valuable knowledge to other scientists working in [cognitive neuroscience](#)," Lefcort said.

"Understanding how a healthy brain works is important in terms of knowing its impact on cognitive functions such as memory, learning and in this case attention," Noudoost said. "By exploring normal [brain function](#), we can better understand what happens in someone with a mental illness."

According to Lefcort, Noudoost and neuroscience professor Charles

Gray are strengthening MSU's contribution to the field of cognitive neuroscience.

"Behrad is an exquisitely trained neuroscientist. He offers students a viewpoint as both scientist and a physician," Lefcort said. "We are thrilled to have him and he has already brought new energy and is bolstering our impact on the growing field of brain research."

Noudoost joined MSU's Department of Cell Biology and Neuroscience last summer from Stanford University and has already been awarded a \$225,000 Whitehall Foundation grant for neuroscience. Whitehall Foundation grants are awarded to established scientists working in neurobiology.

"I am colorblind and I wanted to see the world as others could see it," Noudoost said explaining why he was first drawn into this type of research. "Although I still don't see the world in the same colors as everyone else, I am more amazed everyday by the brain."

Provided by Montana State University

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