

Scientists discover brain's anti-distraction system

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Ashley Livingstone, an SFU first year master's student, models a cap that is fitted with 128 electrodes. They are hooked up to monitor the wearer's brain activity.

(Medical Xpress)—Two Simon Fraser University psychologists have made a brain-related discovery that could revolutionize doctors' perception and treatment of attention-deficit disorders.

This discovery opens up the possibility that environmental and/or genetic factors may hinder or suppress a specific [brain](#) activity that the researchers have identified as helping us prevent distraction.

The *Journal of Neuroscience* has just published a paper about the discovery by John McDonald, an associate professor of psychology and his doctoral student John Gaspar, who made the discovery during his master's thesis research.

This is the first study to reveal our brains rely on an active suppression mechanism to avoid being distracted by salient irrelevant information when we want to focus on a particular item or task.

McDonald, a Canada Research Chair in Cognitive

Neuroscience, and other scientists first discovered the existence of the specific neural index of suppression in his lab in 2009. But, until now, little was known about how it helps us ignore visual distractions.

"This is an important discovery for neuroscientists and psychologists because most contemporary ideas of attention highlight brain processes that are involved in picking out relevant objects from the visual field. It's like finding Waldo in a Where's Waldo illustration," says Gaspar, the study's lead author.



This brain, which belonged to an adult woman, is used in SFU psychology classes and labs to teach students about neuroanatomy.

"Our results show clearly that this is only one part of the equation and that active suppression of the irrelevant objects is another important part."

Given the proliferation of distracting consumer devices in our technology-driven, fast-paced society, the [psychologists](#) say their discovery could help scientists and health care professionals better treat individuals with distraction-related attentional

deficits.

"Distraction is a leading cause of injury and death in driving and other high-stakes environments," notes McDonald, the study's senior author. "There are individual differences in the ability to deal with distraction. New electronic products are designed to grab attention. Suppressing such signals takes effort, and sometimes people can't seem to do it.

"Moreover, disorders associated with attention deficits, such as ADHD and schizophrenia, may turn out to be due to difficulties in suppressing irrelevant objects rather than difficulty selecting relevant ones."

The researchers are now turning their attention to understanding how we deal with distraction. They're looking at when and why we can't suppress potentially distracting objects, whether some of us are better at doing so and why that is the case.

"There's evidence that attentional abilities decline with age and that women are better than men at certain visual attentional tasks," says Gaspar, the study's first author.

The study was based on three experiments in which 47 students performed an attention-demanding visual search task. Their mean age was 21. The researchers studied their neural processes related to attention, distraction and suppression by recording electrical brain signals from sensors embedded in a cap they wore.

More information: Paper:

[jn.sfn.org/press/April-16-2014 ...
e/zns01614005658.pdf](https://www.jn.sfn.org/press/April-16-2014...e/zns01614005658.pdf)

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