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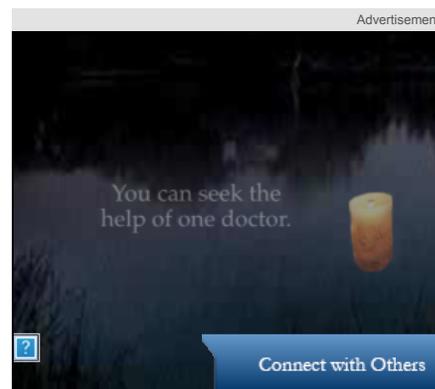
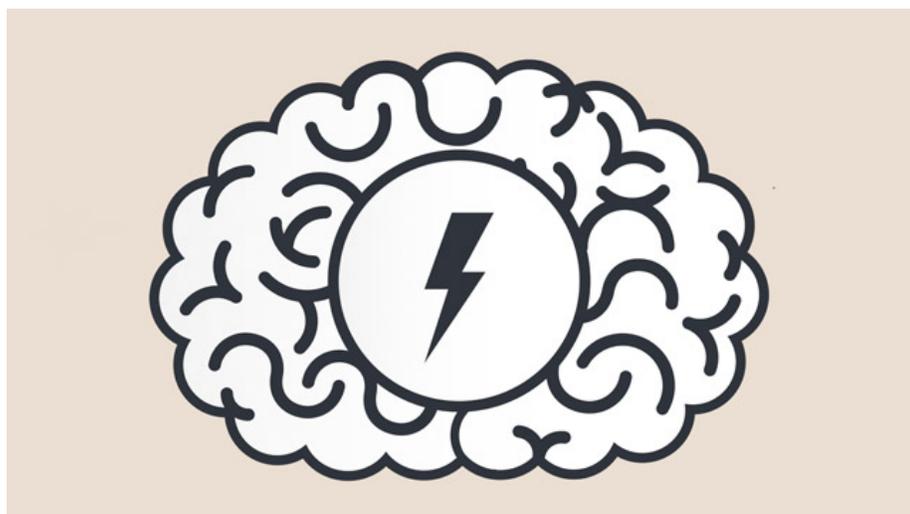
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Attention! Here's How the Brain Focuses Thoughts

Written by Chuck Green | Published on October 7, 2015



Researchers say the attention component of our brain is the basis for all other cognitive function.



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The average person is bombarded with a seemingly infinite amount of stimuli — loud noises, flashing billboards, traffic, voices, sensations, even our own thoughts — in the course of a day. But to function, one must be able to focus on just a few of these, and filter out the ones that aren't useful.

How the brain manages to do this, and why it does so better for some people than for others, has been the focus of years of neuroscience study.

In a [Neuron special issue on "cognitive architectures,"](#) researchers propose an integrated model that maps where and how the brain selectively amplifies certain stimuli to focus our attention.



"Attention's place is to help us structure our internal world so that the thoughts,

emotions, or motivations that are most relevant to our goals will get preferential processing through the brain," the researchers stated in a press release.

The researchers sifted through the thousands of papers published on the science of attention the past three years, in an attempt to integrate this ocean of findings into a single theory.

"Attention is a cascade of effects beginning when a relevant stimulus, like a flash of light, grabs the attention of the front of the brain," Princeton University neuroscientist and study co-author Timothy Buschman, Ph.D., said in the press release.

From there, other neurons suppress competing stimuli. That leads to an increased focus on what's relevant and what is just distracting "noise."

Once the need to focus has passed, the brain resets so attention doesn't get stuck on a single thing, the researchers explained.

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Trying to Filter Flood of Information

The brain's capacity to cope with and manage almost infinite stimuli is one of its most fundamental abilities, upon which everything from critical thought to memory is built.

"Attention's our ability to filter this flood of information in order to select only the particularly important information," Buschman told Healthline. "Attention's a central part of cognition because it helps us focus our cognitive abilities. When our ability to control attention is disrupted, through disease or injury, it's devastating."

The researchers said that without attention, the brain would be like an overflowing river with logs and other debris rolling quickly past.

"Almost all high-order cognitive functions, such as memory, language, or decision-making generally depend on 'attentive state.' That is, attention is a core cognitive ability without which other cognitive functions are quite impaired," said Dr. Sabine Kastner, Ph.D., a Princeton University neuroscientist and study co-author, in a press statement. "Could the brain function without attention? Yes. It does in people with attention deficits, but this is a very difficult state to be in."

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How the Research Can Be Used

Jesse Rissman, Ph.D., labeled the study's approach as "a very productive approach to understanding how a complex organ like the brain works."

Rissman, an assistant professor in cognitive psychology and behavioral neuroscience at the University of California, Los Angeles, works in a lab where people are administered tests measuring the speed and accuracy with which they can focus on relevant information while ignoring distractions.

"Like other researchers across the world, we watch what's happening in the brain as this takes place," Rissman told Healthline. "And technological developments in scientists' ability to record and analyze brain activity have led to new insights into the neural mechanisms of cognition."

He said the research by Buschman and Kastner could assist in understanding, diagnosing, and treating brain disorders.

"Their synthesis of the scientific literature will help researchers and clinicians better understand the nature of attentional control, which in turn may inform our ability to diagnose and treat disorders like ADHD," Rissman continued.

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Other Interesting Brain Facts

In another part of the Neuron special edition, researchers in France unveiled some interesting facts about the brain and memory.

They said the brain records a group of successive data as a chunk of information. That's how it combines letters into words.

They added that the brain also remembers specific delays between information. For example, if a buzzer rings every nine seconds, the brain records that silence as part of the memory. That allows the brain to make predictions the next time the sequence occurs.

The brain records sequences such as A, B, C as ordered lists of individual data. In addition, it stores patterns of repetition. For example, it's easier to remember "7, 7, 5" than "7, 6, 5" because of the repetition of the first two numbers in the first sequence.



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When my brain gets over flooded with thoughts and sounds(which I have battled a lot in my lifetime) and I can not seem to pick out or sort through what is relevant and important and what is not is something that gets very bothersome for me. It can disrupt and overwhelm my daily life in a big way! I have definately found an effective remedy for myself. This improves my overall cognitive functioning and quiets down the anxiety that can be brought on by different noises and sounds coming from around me. Earplugs are an answer for me. As someone with very good hearing and overactive sensory glands, I could easily feel as though I am going mad in the area of attention. Meditation, exercise and breathing exercise helps but this alone does not do the trick for focusing attention all the time. Earplugs are a no fail way for me to give my brain the boost it needs for healthy cognition and attention.

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