Research may lead to treatment of a variety of mental disorders

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One of the first studies published from the University of Missouri Brain Imaging Center (BIC) gives researchers insight into the brain and memory and may provide researchers clues to treating a variety of debilitating disorders.

Nelson Cowan, director of the BIC and Curator's Professor in the Department of Psychological Sciences, used the BIC's magnetic resonance imaging (MRI) to produce graphics that depict the structure and function of the brain during various mental tasks in an effort to understand abstract working memory. People use their abstract working memories to assign meaning when trying to recall facts – for example, when someone dials a set of phone numbers, their abstract memory brings forth an image of the person they are calling.

Previous studies identified an area of the brain responsible for holding abstract working memory, although it was assumed by some researchers to hold only visual information. At the BIC, Cowan found that this same part of the brain can hold auditory information as well. For example, when people hear "Jingle Bells" they relate it to the Christmas season and retain the meaning of the song temporarily.

"This research has given us better understanding of an area of the brain that may be affected in people with various learning disabilities, autism and schizophrenia," said Cowan. "For example, recent research has shown that people with schizophrenia simply hold fewer items in their working memories, rather having an inability to disregard unimportant

items, as previously thought. Thus, discovering more about working memory will enable scientists to better target schizophrenia, among other disorders."

Cowan's research will be published in the *Journal of Cognitive Neuroscience*, and his related research on the childhood development of working memory has been funded by the National Institutes of Health since 1985.

The study is one of many research projects that are currently underway at the BIC.

For example, researchers from the Department of Nutrition and Exercise Physiology in the College of Human Environmental Sciences are studying the neurological effects of eating breakfast on obese people. That research team is also studying the effects of eating breakfast on working memory. Cowan said psychiatry researchers are studying the effects of medications on the brain, and researching addictive behaviors is enhanced by the BIC.

"The center enables us to conduct interdisciplinary research that can advance the field of psychology," Cowan said. "Brain imaging makes our behavioral research more powerful because we can better understand the brain and how it functions during different activities and conditions."

In addition, Nelson says the ability to do brain imaging makes grant proposals stronger. He says the facility attracts new faculty members and makes for better research.

Provided by University of Missouri-Columbia

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