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Drug could improve working memory of people with autism, study finds

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People with an Autism Spectrum Disorder (ASD) often have trouble communicating and interacting with others because they process language, facial expressions and social cues differently. Previously, researchers found that propranolol, a drug commonly used to treat high blood pressure, anxiety and panic, could improve the language abilities and social functioning of people with an ASD. Now, University of Missouri investigators say the prescription drug also could help improve the working memory abilities of individuals with autism.

Working memory represents individuals' ability to hold and manipulate a small amount of information for a short period; it allows people to remember directions, complete puzzles and follow conversations. Neurologist David Beversdorf and research neuropsychologist Shawn Christ found that propranolol improves the working memory performance of people with an ASD.

"Seeing a tiger might signal a fight or flight response. Nowadays, a stressor such as taking an exam could generate the same response, which is not helpful," said Beversdorf, an associate professor in the Departments of Radiology and Neurology in the MU School of Medicine. "Propranolol works by calming those nervous responses, which is why some people benefit from taking the drug to reduce anxiety."

Propranolol increased working memory performance in a sample of 14 young adult patients of the MU Thompson Center for Autism and

Neurodevelopmental Disorders but had little to no effect on a group of 13 study participants who do not have autism. The researchers do not recommend that doctors prescribe propranolol solely to improve working memory in individuals with an ASD, but patients who already take the prescription drug might benefit.

"People with an Autism Spectrum Disorder who are already being prescribed propranolol for a different reason, such as anxiety, might also see an improvement in working memory," said Christ, an associate professor in the Department of Psychological Sciences in the MU College of Arts and Science.

Future research will incorporate clinical trials to assess further the relationship between cognitive and behavioral functioning and connectivity among various regions of the brain.

The study, "Noradrenergic Moderation of Working Memory Impairments in Adults with Autism Spectrum Disorder," was published in the *Journal of the International Neuropsychological Society*. Kimberly Bodner, a psychological sciences doctoral student at MU, and Sanjida Saklayen from the Ohio State University College of Medicine co-authored the study.

Beversdorf also has an appointment in the MU Department of Psychological Sciences. Beversdorf and Christ conduct research at the Thompson Center. As the largest center in Missouri specializing in ASD and other developmental disorders, the Thompson Center is a national leader in confronting the challenges of autism and other developmental conditions through its collaborative programs that integrate research, clinical service delivery, education and public policy.

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