



Discovery

Spring 2020 Thompson Center Research Newsletter

Trials by Fire

Since its inception in 2005, the Thompson Center has served as a national leader in autism research, advancing the field by improving diagnostic measures, identifying genetic markers that cause autism, and developing effective behavioral treatments for people on the spectrum. Now, in its 15th year of autism discovery, treatment and training, the Thompson Center is concentrating on expanding a different phase of autism research: pharmacological clinical trials.

While the Thompson Center has long been a leader in research for behavioral autism treatment, including areas such as Applied Behavior Analysis (ABA) and Social Competence Intervention (SCI), the center, its research core and its leading researchers are now well positioned to expand its examination of the efficacy of various pharmaceuticals in treatment for specific sub-types of autism.

“One of the most exciting areas of autism research is developing and testing new

pharmacological interventions,” said Dr. Stephen Kanne, the executive director of the Thompson Center.

“The scientific approach to truly understanding whether your treatment is making a difference is called a clinical trial. We are well positioned here, with our amazing combination of expert faculty and staff, to begin pursuit of this type of research.”

“Clinical trials are important in that they can lead to better treatments to address specific symptoms or behaviors,” said Nicole Takahashi, administrator of the Thompson Center research core. “It is important for the Thompson Center to be involved in cutting-edge research that has the potential to benefit a large number of patients.”

Running clinical trials can be very demanding and time consuming, Kanne says. A strong infrastructure is needed to run trials correctly. This infrastructure includes specific equipment needs, collaborations with other hospital entities and the personnel with the required expertise. Several of these requirements are met through the Thompson

What’s Inside?

- Sweating for Science
- Catatonia in Down Syndrome
- Hiding in Plain Sight
- Self-Determination in Adults
- Spotlight: Dr. Christina McCrae
- Behavior Therapy and Sleep
- WISC Away the Time

Center research core. This core of expert autism research staffers provides support to the lead investigators, allowing promising results from clinical trials to be achievable.

“Clinical trials require a great deal of coordination with service operations outside the Thompson Center (i.e. phlebotomy, laboratory, cardiology etc.) as well as access to medical expertise,” Takahashi said. “While most trials involve a small number of participants, they can be quite time-consuming to conduct, there is often a great deal of regulatory documentation required. The research core plays a key role in this coordination and documentation.”

Story continued on page 2.

www.thompsoncenter.missouri.edu



Currently, the Thompson Center has three ongoing clinical trials, all led by Dr. David Beversdorf, a Thompson Center researcher and professor of radiology, neurology and psychology in the University of Missouri School of Medicine. The first clinical trial conducted at the Thompson Center, is funded by the Department of Defense, and is nearing its conclusion, with early results appearing promising.

This trial is examining the use of propranolol, a common blood pressure drug, to help reduce anxiety and improve social functioning in children with certain types of autism. Beversdorf says that while the process of conducting this type of research is challenging, the Thompson Center and its resources are up to the task.

“Beyond the needed infrastructure, recruiting is a second challenge to clinical trials,” Beversdorf said. “The research core also is critical to this mission. The many wonderful families that visit the Thompson Center for clinical treatment are given the option to be considered for potential research opportunities, and we are able to meet the needs for recruitment into studies as a result of their support.”



Beversdorf says access to the entire staff of providers at the Thompson Center makes these types of important studies possible.

“The advantages of having the involvement of our expert nursing staff and physicians, the family resource team, the psychologists, and the behavioral intervention specialists in the care of families also helps keep families engaged by providing a full range of support for their care. This also allows clinical trials to succeed as an added opportunity.”

The third clinical trial is currently in its early stages and involves the testing of a drug developed by the pharmaceutical company, Otsuka, for potential use in treating autism symptoms. Beversdorf says working with his patients on a regular basis drives his passion

“As we learn more about how autism presents, and how truly diverse a disorder it is, we are also learning that different treatments may work better than others depending on a child’s specific autism symptoms,” Kanne said.

While there are currently three ongoing clinical trials, Thompson Center researchers are working to gain funding and approval to begin others in the future. A future that promises to be filled with more and better treatments for all people with autism.

Highlighting the promise of personalized health care and the impact of interdisciplinary collaboration at the NextGen Precision Health Institute, this type of research is part of the systemwide NextGen Precision Health Initiative dedicated to solving the world’s most critical health problems. Partnering together with government and industry leaders, the NextGen Institute at Mizzou empowers bold cross-disciplinary innovation and life-changing precision health advancements targeting individual genetic, environmental and lifestyle factors.



Takahashi’s team manages a large database of potential research participants, providing Thompson Center researchers with access to a large autism population. Takahashi also credits the Thompson Center’s clinical staff, including physicians, a nurse practitioner and nurse clinicians, as well as clinical services made possible through the University of Missouri to support trials as well as train research core staff to perform assessments.

The second ongoing clinical trial is examining the use of minocycline, a common acne drug, as a means to improve social communication among another subset of children with autism.



Sweating for Science

When people become stressed, their bodies can respond by sweating. Now, researchers at the University of Missouri are monitoring how much adolescents severely affected by autism sweat in order to better understand when behavioral issues, such as aggression, are likely to occur.

Bradley Ferguson analyzed the stress levels of eight adolescents who are severely affected by autism spectrum disorder at The Center for Discovery, a residential facility in New York that provides advanced care and research for individuals with complex conditions. Using wrist and ankle monitors, Ferguson found that there was a rise in the body's electrodermal activity – which results from increased levels of sweat – 60% of the time before an individual showed behavioral issues.

“A spike in electrodermal activity is telling us that the individual's body is reacting physiologically to something that is stressful, which could be their internal state, something in the environment, or a combination of the two,” said Ferguson, assistant research professor in the departments of health psychology,

radiology and the Thompson Center for Autism and Neurodevelopmental Disorders. “If parents or caregivers are notified ahead of time that their child's stress levels are rising, they might have a chance to intervene and de-escalate the situation before problem behaviors occur.”

Ferguson explained that possible intervention methods could include removing the child from the environment or activity that is causing the stress, as well as providing access to an item that the child enjoys interacting with in an effort to calm them.

“Individuals who are severely affected by autism spectrum disorder are often unable to verbally communicate their discomfort when they become stressed,” Ferguson said. “However, their body still responds to stressors just like anyone else. Therefore, being alerted of increases in electrodermal activity can allow parents and caregivers to intervene prior to engagement in problem behavior with the goal of ensuring the health and safety of those involved.”

Ferguson collaborated on the study with David Beversdorf, a professor of radiology, neurology and psychology in

the MU College of Arts and Science as well as principal investigator of the Cognitive Neuroscience Laboratory in the MU School of Medicine. Ferguson also collaborated with Theresa Hamlin, Johanna Lantz, and Tania Villavicencio at The Center for Discovery, and John Coles at Calspan-University of Buffalo Research Center and The State University of New York at Buffalo.

“Important work is being done to try to identify predictors for when a person with autism is at greatest risk of having a behavioral episode,” Beversdorf said. “This research highlights the individual variability in this response that must be considered, and may also have implications for individualized treatment approaches moving forward.” “Examining the association between electrodermal activity and problem behavior in severe autism spectrum disorder: A feasibility study,” was published in *Frontiers in Psychiatry*.

The study was funded by the New York State Center of Excellence, New York State Department of Health and Office for People with Developmental Disabilities, as well as private monies donated to The Center for Discovery.

Story by Brian Consiglio, MU News Bureau

Catatonia in Down Syndrome

Down syndrome, due to an extra chromosome 21, occurs in 250,000 children and adults in the United States, making it the country's most common chromosomal disorder. Inherited heart defects, thyroid cancer, celiac disease and developmental disabilities are common Down syndrome complications. Only recently has catatonia, a behavioral condition marked by new onset immobility, mutism, withdrawal and other behavioral abnormalities, been recognized in Down syndrome.

While considerable research has been done on Down syndrome, little is known about associated catatonia. Now, researchers at the University of Missouri have conducted the first longitudinal study of consecutively diagnosed individuals with catatonia in order to identify the most effective treatments and outcomes.

Judith Miles, professor emerita of child health-genetics in the MU Thompson Center for Autism and Neurodevelopmental Disorders, thoroughly assessed seven adolescents with Down syndrome and diagnosed with catatonia between 2013 and 2018.

“As this was the first well-studied group of patients with Down syndrome who developed catatonia, we collected a comprehensive data set of medical, developmental, demographic, family, social and genetic information,” Miles said. “By involving the patients' families throughout the process, we were able to monitor progress over time in a patient-centered way.”

Miles found catatonia in young people with Down syndrome,



for the most part, resembles catatonia complicating other psychiatric and medical disorders. Lorazepam, a sedative drug that helps restore the balance of neurotransmitters in the brain, and electroconvulsive therapy, which involves a brief electrical stimulation of the brain while the patient is under anesthesia, both resulted in reduced behavioral symptoms over time. The research highlights the importance of sustained treatment to help patients with Down syndrome and catatonia maintain recovery long-term.

“This research can help families, physicians and psychiatrists who take care of kids with catatonia,” Miles said. “Our main goal is to enhance medical services and treatment options in order to ultimately improve health outcomes.”

Hiding in Plain Sight

At its roots, autism is a social communication disorder, which often makes it difficult for people with ASD to communicate with others and function appropriately in social situations. To combat these challenges, adolescents and adults with autism often learn how to blend in socially so as not to stick out as awkward or anti-social. This process of blending in socially is referred to as “camouflaging.”

A new study by researchers at the Thompson Center shows that girls and women with autism increase the use of camouflaging as they age, while males with autism actually reduce the practice as they mature. The study also showed that girls have higher levels of camouflaging than boys regardless of age. Understanding how and why people with autism practice camouflaging is important for determining how to best help them integrate successfully and meaningfully into society.

“Previous studies have shown that camouflaging can result in increased levels

of depression and stress, so it's important to understand in what situations people with ASD use camouflaging so we can help provide them with healthy alternatives,” said lead author Courtney Jorgenson, a doctoral student in the University of Missouri Department of Psychological Sciences.

For the study, Jorgenson surveyed adolescents with and without autism between the ages of 13-18 in order to determine when and how they used camouflaging in order to “fit in.” Behaviors she measured included, but were not limited to:

- consciously monitor their body language and eye contact;
- learn appropriate behaviors by watching and imitating peers;
- think about the social impression they are making on others;
- think about how much they are performing and not being themselves.

Jorgenson found that girls with autism used camouflaging more than boys regardless of age. She also found that while

girls increased their use of camouflaging as they aged, boys tended to decrease the use of camouflaging as they matured. Jorgenson says these results are important because they show the need for increased vigilance when looking for which individuals on the spectrum need support.

“Because they increase camouflaging as they age, girls with autism tend to look more like their neurotypical peers,” Jorgenson said. “They grow better at hiding their autism, which makes them harder to identify as needing support. When you feel like you are constantly putting on an act and not being yourself, your levels of stress and depression can understandably increase, so it is important to identify those who are camouflaging and make sure they are receive the support they may need.”

This pilot study used data from 140 participants. Future research will use the newly created SPARK research match program to recruit additional participants. The study is currently under review for publication.

Self-determination helps young adults with autism succeed

The independence that comes with growing up can be scary for any teenager, but for young adults with autism spectrum disorder and their caregivers, the transition from adolescence to adulthood can seem particularly daunting. Tasks such as managing one's own health insurance or applying for a car loan can be especially challenging for individuals with developmental disabilities.

Now, researchers at the University of Missouri are working on improving independence for people with autism by setting personalized goals early in adolescence and providing opportunities to achieve those goals. In the new study, Nancy Cheak-Zamora, associate professor in the MU Department of Health Sciences, School of Health Professions, and researcher at the Thompson Center for Autism and Neurodevelopmental Disorders, measured the self-determination of young adults with autism to better assist their transition to adulthood.

“We found that there was a disconnect between the support the caregivers are providing and what the young adults are doing themselves to become more independent,” Cheak-Zamora said. “We need to allow adolescents, particularly those with disabilities, to take on greater responsibilities at an earlier age and raise their expectations by first asking them about their goals and then providing the resources and support systems to help them achieve those goals.”

Cheak-Zamora partnered with five autism clinics across the country to survey more than 500 caregivers of young

adults with autism between the ages of 16 and 25. She worked with undergraduate and graduate students to analyze the results and found that many young adults with autism are struggling to achieve independence.

Cheak-Zamora explained that increasing self-determination for young adults with autism starts with shifting the perception about what individuals with developmental disabilities can achieve.

“As a society it would be helpful to move away from a focus on deficits and challenges that people with autism and other disabilities face to considering their strengths and skill set. We can then develop ways to help each person build on their strengths,” Cheak-Zamora said. “For example, many with autism are incredibly detail-oriented. So, let's think about job opportunities that require very detailed work so they can use that skill as an asset to succeed in employment. Not only will the individual benefit, but society as a whole will as well.”

Cheak-Zamora recommends that parents and caregivers provide all adolescents, including those with developmental disabilities, with opportunities to experience mastering a task, such as cooking, shopping, managing money or driving. The study, “Self-determination in young adults with autism spectrum disorder,” was published in *Autism*. Funding was provided by the United States Department of Defense IDEA Development Award. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agency.

Recent Research Publications

- Beversdorf DQ. (2019). Neuropsychopharmacological regulation of performance on creativity-related tasks. *Curr Opin Behav Sci* 27:55-63
- Beversdorf DQ, Adams NR. (2019). Attitudes toward animal research among medical students in the United States. *J Am Assoc Lab Anim Sci* Epub ahead of print.
- Beversdorf DQ, Stevens HE, Margolis KG, van de Water J. (2019). Prenatal stress and maternal immune dysregulation in autism spectrum disorders- potential points for intervention. *Curr Pharm Des* doi: 10.2174/1381612825666191119093335. [Epub ahead of print] PMID:31742491
- Bodner, K. E., Cowan, N., & Christ, S. E. (2019). Contributions of filtering and attentional allocation to working memory performance in individuals with autism spectrum disorder. *Journal of Abnormal Psychology*, 128(8), 881-891. <https://doi.org/10.1037/abn0000471>.
- Boland KM, Stichter JP, Beversdorf DQ, Christ SE. (2019). Brief Report: Flanker Visual Filtering Ability in Older Adolescents with Autism Spectrum Disorder. *J Autism Dev Disord* 49(1):422-428.
- Cheak-Zamora, N. C., Maurer-Batjer, A., Malow, B. A., & Coleman, A. (2019). Self-determination in young adults with autism spectrum disorder. *Autism*. <https://doi.org/10.1177/1362361319877329>.
- Cheak-Zamora, N.C., Teti, M., Maurer-Batjer, A. et al. (2019). Sexual and Relationship Interest, Knowledge, and Experiences Among Adolescents and Young Adults with Autism Spectrum Disorder. *Arch Sex Behav* 48, 2605-2615. <https://doi.org/10.1007/s10508-019-1445-2>.
- Contreras BP, Cooper AJ, Kahng S. (2019). Recent research on the relative efficiency of speaker and listener instruction for children with autism spectrum disorder. *J Appl Behav Anal*. doi: 10.1002/jaba.543. [Epub ahead of print] Review.
- Dovgan, K. N., Nowell, K. P., & Aguilar, J. (2019). Influences on Parent Perceptions of Autism Severity. *Focus on Autism and Other Developmental Disabilities*. <https://doi.org/10.1177/1088357618815884>
- Ferguson BJ, Dovgan K, Takahashi N, Beversdorf DQ. (2019). The relationship among gastrointestinal symptoms, problem behaviors, and internalizing symptoms in children and adolescents with autism spectrum disorders. *Front Psychiatry* 10:194. doi: 10.3389/fpsy.2019.00194
- Ferguson, B.J., Hamlin, T., Lantz, Johanna, Villavicencio, T., & Beversdorf, D.Q. (2019). Examining the association between electrodermal activity and problem behavior in severe autism spectrum disorder: A feasibility study. *Frontiers in Psychiatry*, 10, 654.
- First, J. M., Cheak-Zamora, N. C., Teti, M., Maurer-Batjer, A., & L First, N. (2019). Youth perceptions of stress and coping when transitioning to adulthood with autism: A photovoice study. *Qualitative Social Work*, 18(4), 601-620. <https://doi.org/10.1177/1473325018757078>.
- Goin-Kochel, R. P., Scaglia, F., Schaaf, C. P., Berry, L. N., Dang, D., Nowell, K. P., ... Beaudet, A. L. (2019). Side Effects and Behavioral Outcomes Following High-Dose Carnitine Supplementation Among Young Males With Autism Spectrum Disorder: A Pilot Study. *Global pediatric health*, 6, 2333794X19830696. doi:10.1177/2333794X19830696
- Hegarty, J. P., Zamzow, R. M., Ferguson, B. J., Christ, S. E., Porges, E. C., Johnson, J. D., & Beversdorf, D. Q. (2019). Beta-adrenergic antagonism alters functional connectivity during associative processing in a preliminary study of individuals with and without autism. *Autism*.
- Keller-Margulis, M.A., Ochs S., Nowell, K.P., & Mire, S.S. (in press). Role of the school-based professional: Linking systems of care. In. A. Dempsey (Ed). *Pediatric Health Conditions in Public Schools*
- Kercher C, Azinfar L., Dinalankara DMR., Takahashi TN, Miles, JH, Yao, G. A longitudinal study of pupillary light reflex in 6- to 24-month children. *Sci Rep* 10, 1205 (2020). <https://doi.org/10.1038/s41598-020-58254-6>
- Liu D, Baskett W, Beversdorf D, Shyu C-R. (2019) Exploratory data mining for subgroup cohort discoveries and prioritization. *IEEE J Biomed Health Informatics* epub ahead of print DOI: 10.1109/JBHI.2019.2939149.
- Mazurek MO, Stobbe G, Loftin R, Malow BA, Agrawal MM, Tapia M, Hess A, Farmer J, Cheak-Zamora N, Kuhlthau K1, Sohl K. (2019). ECHO Autism Transition: Enhancing healthcare for adolescents and young adults with autism spectrum disorder. *Autism*. <https://doi.org/10.1177/1362361319879616>.

Recent Research Publications (cont.)

- Nair, N., Hegarty II, J. P., Ferguson, B. J., Hecht, P. M., Tilley, M., Christ, S. E., & Beversdorf, D. Q. (2019). Effects of stress on functional connectivity during problem solving. *NeuroImage*, 116407.
- Nowell, K. P., Bodner, K. E., Mohrland, M., & Kanne, S. (2019). Neurodevelopmental disorders in rehabilitation psychology: autism spectrum disorder as a model. In T. Elliott, L. Brenner, S.A. Reid-Arndt, R.G. Frank & B. Caplan (Eds.). *Handbook of Rehabilitation Psychology*, Third Edition. Washington, D.C.: American Psychological Association.
- Spencer M, Khan S, Talebizadeh Z, Shyu CR. Explainable AI: Mining of Genotype Data Identifies Complex Disease Pathways – Autism Case Studies. *Application of Omics, AI and Blockchain in Bioinformatics Research*. World Scientific, Singapore. (in press, July 2019)
- Teti M, Cheak-Zamora N, Bauerband LA, Maurer-Batjer A. (2019). A Qualitative Comparison of Caregiver and Youth with Autism Perceptions of Sexuality and Relationship Experiences. *J Dev Behav Pediatr*. 40(1):12-19. doi: 10.1097/DBP.0000000000000620.
- Yang B, Fritsche KL, Beversdorf DQ, Gu Z, Lee JC, Folk WR, Greenlief CM, Sun GY (2019) Yin-Yang Mechanisms Regulating Lipid Peroxidation of Docosahexaenoic Acid and Arachidonic Acid in the Central Nervous System. *Front. Neurol*. 10:642. doi: 10.3389/fneur.2019.00642
- Yang B, Li R, Woo T, Browning Jr JD, Song H, Gu Z, Cui J, Lee JC, Fritsche KL, Beversdorf DQ, Sun GY, Greenlief CM. (2019). Maternal dietary docosahexaenoic acid alters lipid peroxidation products and (n-3)/(n-6) fatty acid balance in offspring mice. *Metabolites* (in press).

TIPS for Kids Research Projects

The primary goal of Training in Interdisciplinary Partnerships and Services (TIPS) for Kids is to train future leaders who will work with children with special healthcare needs. Current trainees are graduate students in occupational therapy, physical therapy, speech/language pathology, social work, special education, applied behavior analysis, and psychology. In addition to didactic coursework and clinical experiences, TIPS for Kids trainees also complete a leadership project. This year's projects include:

Creating an Implementation Guide for Kindness Clubs

Researchers: Katelyn Sallee, Erin Couch and Morgan Trachsel

The researchers developed a guide for implementation of middle school educators looking to begin a Kindness Club. The plan includes a Kindness Club mantra, schedule of events, noted strengths and suggestions for improvement, resource links and evidence links. This implementation guide may be used by existing Kindness Clubs and other schools seeking to start a similar program.

Social Language

Researchers: Haleigh Fancher, Marla Hernandez and Jessica Lisenbee

The researchers focused on developing resources to promote the use of skills learned at the Thompson Center social language group outside of the clinical setting and to develop a framework that other groups and individuals can use for creating an effective take-home program that encourages generalization.

VR Exposure Therapy

Researchers: Nargiza Buranova, Grant Parks and Melissa Maddox

Virtual Reality has shown promise in decreasing anxiety among individuals with autism through their exposure to anxiety-producing scenarios in VR. The researchers created a virtual reality program that displays various real-life scenarios that trigger anxiety in the hopes of helping those with ASD process and positively adapt to their surroundings when practicing inside the VR environment.

Supporting Grand & Kinship Families Raising Children With Disabilities

Researchers: Todd Koppinger, Rebecca Alten and Sarah DeMarchena

The researchers are assessing the needs of grandparents raising children with disabilities. This population faces unique challenges compared to typical adults in their age group, such as custody issues, unexpected financial burdens, social isolation, and caregiving demands. They hope to gain a proper understanding of grand-families' needs, common concerns, and considerations to inform services.

Callaway Adult Day Program Collaboration

Researchers: Laurel Royer, Haley Homan and Britney Liu

The researchers are working with an agency runs a day program for adults with disabilities to explore adaptive movement curriculum, communication device training, quality of life survey implementation, and staff retention techniques that can be implemented in their facilities. We hope to establish a relationship with this organization to support them in ways they have established will be useful for their program.

Researcher Spotlight: Dr. Christina McCrae



Who are you?

I'm a professor in the MU Department of Psychiatry and director of the MizZzou Sleep Research Lab.

How did you get here?

I grew up in Mifflintown, Pennsylvania and earned my undergraduate degree from Penn State University before earning my masters and doctoral degrees from Washington University in St. Louis. Before I worked at the University of Missouri, I served as a project coordinator and post-doctoral fellow at the University of Memphis and as an associate professor of clinical and health psychology at the University of Florida. I have been at Mizzou since 2015.

What are your research interests?

My work in the area of autism is relatively recent, but stems logically from my longstanding interest in comorbid insomnia and the impact of treatment for insomnia on co-occurring disorders. I am a licensed psychologist who is board certified in behavioral sleep and I have a background in clinical psychology with specialized training and expertise in cognitive behavioral therapy (CBT) and behavioral sleep medicine. In 2005, I completed the NIH/OBSS training program on the conduction of randomized controlled

trials involving behavioral interventions. Since 1999, I have been involved in the conduction of multiple federally-funded RCTs involving CBT.

How did you first get involved with autism research?

When I moved to MU in 2015, I began collaborating with former Thompson Center researcher Dr. Micah Mazurek on adapting a cognitive behavioral treatment for insomnia for typically developing children to children with autism. The treatment we adapted was one that I had developed and used while at the University of Florida.

What is one thing you hope to discover or understand better by the end of your career?

The role of sleep in autism and other chronic disorders that are highly comorbid with insomnia. Perhaps even more importantly, I want to expand my research beyond the development, adaptation and initial testing phases to widespread dissemination to 'real world' patients and providers. Often, treatments are developed and tested and the results are published in a scientific journal....and that's it. By the end of my career, I really want to starting moving those interventions off-the-shelf and out-of-the-journal to reach the patients that need them and train real world providers to deliver them.

What motivates you?

First, I have always valued the importance of sleep as a foundational health behavior. As a society, we have long recognized the importance of diet and exercise, but have only recently started paying more attention to sleep. I hope to see increased awareness of the importance of sleep and the positive effects of improving sleep on health in individuals of all ages with chronic conditions and disorders. Second, in recent

years I've increasingly become interested in sleep in children, particularly children with autism, and the importance of establishing and maintaining good sleep early in life. As part of that work, I'm also motivated to work with families because improving the sleep of children can have important carryover effects to parents as well as other family members. Finally, while medical and pharmacological interventions are important aspects of health care, I am very motivated to develop and research non-drug, behavioral treatments and to demonstrate that those can also prompt significant and long-lasting, positive changes in the functioning of the body and the brain.

Learn more about the Mizzou Sleep Research Lab

The Mizzou Sleep Research Lab investigates the mechanisms underlying normal and pathological sleep, the link between sleep and cognition, the daily variability inherent in sleep and sleep-related behaviors and the efficacy and effectiveness of cognitive-behavioral interventions to treat insomnia in diverse populations. Those populations include children with Autism Spectrum Disorders, overweight and obese people of all ages, senior citizens, dementia caregivers and sufferers of ailments that include pain, cardiac disease, cancer, and end-stage renal disease. As a result of these research emphases, we collaborate with a broad range of investigators that specialize in aging, autism, cardiology, cognition, immunology, neuroimaging, neurology, nursing, obesity, pain, psycho-oncology, rheumatology and sleep medicine. The Mizzou Sleep Research Lab, directed by Dr. Christina McCrae, is part of the Department of Psychiatry at the University of Missouri School of Medicine.

Behavioral Therapy for Insomnia Shows Benefit for Children with ASD

Insomnia is the most common sleep disorder in children with autism and affects up to 80% of children with ASD, with a strong link between insomnia and the severity of ASD-related symptoms, including social impairment, communication difficulties and anxiety. Insomnia's impact on children with ASD can affect the entire family, causing sleep loss and additional stress for parents. Now, researchers from the University of Missouri School of Medicine and the Thompson Center have found cognitive behavioral therapy (CBT) can improve child and parent sleep, child behavior and parent fatigue.

"You can't make yourself sleep better," said Dr. Christina McCrae, professor in the Department of Psychiatry at the MU School of Medicine. "Sleep is a natural process. It's not an intentional activity. The first step to curing insomnia for children with ASD involves setting the stage for the circadian clock and the sleep rhythm to work the way they are meant to work."

McCrae's study involved children ages

6 to 12 with ASD who were also diagnosed with insomnia. Parents of the children also participated in the study. Both parents and children completed daily electronic sleep diaries which detailed how long it took to fall asleep, total sleep time and other factors. They also wore electronic devices on their wrists to measure limb movement, which is an objective way to measure sleep quality. Each family also completed eight CBT sessions with therapists designed to address the barriers preventing sleep.

"Instead of a uniform plan for all participants, we targeted each family's most pressing concerns and organized our therapy to address those key issues early on," McCrae said. "That provided more time in later sessions for families to refine their techniques with help from their therapist."

Following the eight CBT sessions, data showed the children who participated showed sleep and behavior improvements. After one month, 85% no longer experienced insomnia. Parents involved in the study experienced less fatigue and better sleep,

according to the monitors and self-reporting diaries.

"We looked at how many sessions the families attended, how well the families understood the treatment, and the subjective and objective outcomes," McCrae said. "As the paper shows, the outcomes are amazing. While it makes sense that child sleep impacts parental sleep, I didn't expect the parents to see as much improvement as they did in the study."

McCrae hopes to expand this pilot study into a randomized controlled trial with an active control group and a more diverse sample.

The study, "Cognitive Behavioral Treatment of Insomnia in School-Aged Children with Autism Spectrum Disorder: A Pilot Feasibility Study," was recently published in the journal *International Society for Autism Research*.

This story was written by MU Health strategic communications office.

WISC Away the Time

For decades, neuropsychologists have used the Wechsler Intelligence Scale for Children (WISC) test as the gold-standard IQ test to determine the intellectual abilities of children with special needs. However, this comprehensive test takes more than hour—sometimes two hours—to complete and many children with special needs have a difficult time participating in such long tests.

Now, researchers from the University of Missouri and the Thompson Center have succeeded in shortening the current version of the WISC test, the WISC-V, while still maintaining its accuracy in determining a child's IQ.

For the study, John Lace, a doctoral student at Saint Louis University who is completing an internship in clinical neuropsychology in the MU School of Health Professions, studied data from Thompson Center neuropsychological evaluations where the WISC-V was utilized. Lace and colleagues were able to identify which measures of the WISC-V were vital for accurate results and were able to remove as many as 4-5 measures that appeared to be repetitive. When recalculating the results of the tests after removing those repetitive measures, Lace found that the results remained similar.

"We think that by removing these measures, we can shorten the WISC-V while maintaining efficacy," Lace said. "Even 15 or 20 minutes shorter would make a huge difference for children with special needs and their ability to complete the test. It would greatly increase the accessibility for children and make their evaluation process much easier."



Neuropsychologists use the WISC-V as an important part of their evaluation of children with special needs. They use the results to help inform decisions about treatment and educational plans. Dr. Mike Mohrland, a neuropsychologist at the Thompson Center, says the WISC-V is often the most important test in both diagnostics and treatment planning.

"Decreasing the time it takes to test kids is an ever-increasing need in today's culture," Mohrland said. "Testing kids faster helps with their motivation and optimal stamina. Another benefit is that it allows more time to test other vital cognitive skills. This study is a showcase of the impressive caliber of trainees we get to work alongside at the Thompson Center."

The researchers say the next step is to expand their shortened WISC-V version into clinical application. The study has recently been accepted for publication pending revisions. Co-authors include Zachary Merz, Dylan Seitz, Tara Austin, Erin Kennedy, Bradley Ferguson and Mike Mohrland.

WANT TO HELP? JOIN A STUDY!

SPARK

SPARK is a free online study with a simple mission: to speed up research and advance the understanding of autism. By building a community of tens of thousands of individuals with autism and their biological family members who provide behavioral and genetic data, SPARK is the largest national autism research study to date. Participation in SPARK can be done entirely at home. You can register online in 20-30 minutes at: <https://sparkforautism.org/MUTC>.

Enrollment includes completing a few questionnaires and providing a saliva DNA sample using collection kits sent directly to your home. Receive a gift card valued up to a total of \$50 for participation. Find out more about what's involved on our SPARK page: <https://thompsoncenter.missouri.edu/autism-research/spark/>.

Questions? Contact Samantha Hunter at: 573-882-6479 or huntersg@health.missouri.edu

Trial of Minocycline in Children and Youth with ASD

The purpose of this study is to learn more about how a medication called minocycline could be used to treat some impairments related to Autism Spectrum Disorder. Minocycline is an antibiotic that is currently used for the treatment of acne.

- Eligibility: Age 12-22 with a diagnosis of ASD
- Time required: Up to 5 visits and 6 phone calls over the course of 3 months
- Location: Thompson Center
- Compensation: up to \$500 for time and effort
- Contact: Violeta Douce, (573) 884-3501, douceav@health.missouri.edu
- Research study director: David Beversdorf, MD

Trial of Propranolol in Children and Youth with ASD

The purpose of this study is to investigate how propranolol—a drug generally prescribed for high blood pressure—might improve social communication in those with autism. Researchers also will be looking into possible relationships between autism symptoms and how well someone responds to propranolol.

- Eligibility requirements: Age 7-24 with ASD diagnosis
- Time required: 3 visits over the course of 14 weeks
- Location: Thompson Center
- Monetary compensation: Yes
- Contact: Kathy Hirst, 573-882-5643 or hirstka@health.missouri.edu

Validation of a Salivary miRNA Diagnostic Test for Autism Spectrum Disorders

The purpose of this study is to validate the ability of a salivary RNA panel (diagnostic test) to differentiate children diagnosed with Autism Spectrum Disorder (ASD) from those with developmental delays. This study will help to further aid in diagnosing individuals with ASD.

- Eligibility requirements: Age 18-48 months with diagnosis of ASD or developmental delay
- Time required: 1-2 visits over the course of 12 months
- Location: Thompson Center
- Monetary compensation: Yes
- Contact: Kathy Hirst, 573-882-5643 or hirstka@health.missouri.edu

AutismEYES

The purpose of this study is to validate the ability of a remote eye gaze tracker to differentiate children diagnosed with Autism Spectrum Disorder (ASD) to those with developmental delays. We will also be looking at how well eye gaze correlates with autism symptom severity and language ability.

- Eligibility: Age 2-17 years presenting for an evaluation of ASD.
- Time required: 1-3 visits over the course of 4 months
- Location: Thompson Center
- Compensation: Yes
- Contact: Julie Muckerman, 573-884-6838, muckermanju@missouri.edu
- Research study director: Stephen Kanne, PhD, ABPP

Interested in being contacted for future studies?
Call 573-303-8405 or email tcresearch@missouri.edu.

Stay Connected.

Keep in touch with all that's happening at the Thompson Center. Find us:
thompsoncenter.missouri.edu



@thompsoncenter



@mutcautism



@thethompsoncenter



@mutcautism

205 Portland St.
Columbia, MO 65211
573.884.6052
thompsoncenter@missouri.edu



Thompson Center for Autism
& Neurodevelopmental Disorders

University of Missouri