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Thompson Center for
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DISCOVERY

Fall 2024 Research Newsletter

Driving Innovation Through Multisite Studies

To maximize efficiency and foster expertise, the Thompson Center has developed a unique research structure that supports our mission of supporting individuals and families impacted by autism and other neurodevelopmental diagnoses. Our centralized Research Core allows our dedicated faculty to work on a wide range of studies with professional support, ensuring that the complexities of autism are met with the utmost care. This structure, alongside our access to the Thompson Center clinic and partnerships with other clinics across the MU Health Care system, allows

us to be a leader in large, multisite studies, which can offer invaluable benefits to our patients and their families.

Why Multisite Studies Matter

Large, multisite studies allow researchers to access a more diverse group of participants, making the results more reliable and applicable across a broader range of settings. A larger pool of participants means that we can analyze subgroups more effectively—whether by age, gender, or other factors—providing

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more personalized insights. For families, this means that the findings from these studies are more likely to reflect real-world experiences and can ultimately lead to better services and supports.

Let's take a closer look at some of the impactful multisite studies happening at the Thompson Center.

EarliTec: Eye Tracking for Early Autism Diagnosis

One of the innovative projects currently underway at the Thompson Center is the EarliTec study, developed by EarliTec Diagnostics Inc. This study uses a tablet device called the EarliPoint Evaluation for Autism Spectrum Disorder. The device shows videos depicting social interactions and tracks what the child is attending to by measuring their eye movements. An algorithm analyzes the data, and calculates the likelihood of autism.

To validate the device, participants undergo cognitive or developmental testing conducted by trained staff. This comprehensive approach aims to create a valid, reliable, easy-to-use autism screening tool that can be applied across clinical settings.

Since joining the EarliTec study in 2023, the Thompson Center has recruited about 70% of the typically developing participants needed for the research. These participants also undergo developmental and IQ testing, and parents are notified if the results suggest the need for further evaluation.

Our team has also consulted on aspects like IQ test administration and case management,

Want to Participate?



Learn more about joining these studies and others on the back of this newsletter

helping to guide best practices for other participating research sites.

SPARK: The Largest Genetic Study of Autism

Another large-scale project happening at the Thompson Center is SPARK, the world's largest genetic study of autism. With more than 100,000 individuals with autism and 175,000 of their family members enrolled, SPARK aims to better understand the genetic causes of autism and to use this knowledge to inform therapies, treatments, and support systems.

SPARK's broad participant base has allowed researchers to identify more than 100 genes linked to autism. Families identified to have specific genetic links to autism receive personalized reports, providing crucial insights for roughly 10% of the participants. Additionally, through SPARK Research Match, participants are connected with other relevant research opportunities.

The Thompson Center is in its ninth grant year for SPARK and was the top recruiter out of 17 clinical sites last year, contributing to the vast scale that allows researchers to identify patterns and subgroups in autism with more accuracy than smaller studies could.

The Early Years Study: Exploring the Earliest Signs of Autism

The Early Years Study, originally launched at Brown University, focuses on identifying early indicators of autism in infants. This study collects data from infants and their families, including recordings of infant cries, developmental milestones, temperament, and behaviors. The goal is to understand early markers of autism that could lead to earlier and more effective interventions.

As recruitment for the Early Years Study wraps up, researchers are preparing for the next phase of the project. Children whose screening results at age two indicate the possibility of autism will be invited to come to the Thompson Center for a comprehensive evaluation. The results of this testing will be given to families in order to support and find resources for their children. The results will also help the research team to identify a set of infant characteristics

Researcher Spotlight: Dr. Kerri Nowell

Kerri Nowell, Ph.D., joined the Thompson Center health psychology team as a postdoctoral fellow in 2016. Dr. Nowell stayed on as a faculty member after the completion of her training and became the Director of Health Professions at the Thompson Center in May. She is an Associate Clinical Professor in the Department of Health Psychology in the University of Missouri College of Health Sciences. Dr. Nowell is the principal investigator on the EarliTec and SPARK studies at the Thompson Center.



Tell us about your educational background.

I earned my bachelors in psychology and pre-med with a minor in biology from the University of Texas at Arlington. Then, I completed my masters degree in school psychology at Sam Houston State University in Huntsville, TX. I got my Ph.D. in school psychology from the University of Houston.

How did you first get involved with autism research?

I worked for seven years as a school psychologist before taking a position at Baylor College of Medicine's Texas Children's Hospital in the Department of Genetics. While at Texas Children's, I became a site supervisor for the Simons Simplex Collection (SSC), a national autism genetics study which had another site at the Thompson Center. Though I loved my work with youth identified with neurodevelopmental disorders in school, it was the SSC that solidified my specific interest in autism.

What are your research interests?

I'm a clinician researcher. My clinical work drives my research, and my research informs my clinical practice. Most of my research questions come from the work I do with families. I want to find ways to improve diagnostic processes in a way that best supports families, gives us the best data possible, reduces wait times, and removes barriers to healthcare access. Over time, I've become increasingly interested in strengths-based research questions and looking beyond the current medical model of autism.

What is the long-term goal of your research?

The medical model is important for making an autism diagnosis, because that's how people get services and it helps people understand why they are the way they are. However, I think being able to incorporate strengths into clinical practice will ultimately lead to better outcomes for people with autism.

What is your favorite thing about working in this field?

The patients and families! The kids I get to work with are hilarious and so unique. It's easy to say that everyone is unique, but getting to experience it every day is a privilege.

that predict the whether a child is likely to be diagnosed with autism.

Beyond its primary aims, the Early Years Study is also exploring several related research questions, such as the connection between parental autistic traits and the likelihood of autism in their children. Learn more about some of the preliminary findings coming from the Early Years Study in the story on page 6.

Many Sites, One Goal

The common goal of all research at the Thompson Center is to make discoveries that benefit neurodiverse individuals and families. Whether it's developing an easy-to-use screening tool through the EarliTec study, unlocking genetic links through SPARK, or identifying early signs of autism in infants through the Early Years Study, we're committed to driving research that will improve lives.

Thompson Center Researchers Present At Annual Autism Conference



Ali DuCharme discusses results from an interdisciplinary partnership between behavior analysts and medical providers (top left)

Dr. **Benjamin Black** presents on personalized medicine (top right)

Jaclyn Benigno (moderator), **Emma Keicher** (BCBA), **Braden Hayse** (graduate researcher), and Dr. **Kerri Nowell** (psychologist) share practical tips on panel for parents (lower left)

Dr. **David Beversdorf** reports insights from his propranolol clinical trials (lower right)



Trainee Spotlight: Braden Hayse

Braden Hayse joined the Thompson Center in 2018 as a psychometrist and a graduate research assistant and practicum student in 2020. Braden's research area of interest is primarily surrounding sleep in individuals with neurodevelopmental disorders or rare diseases. He is particularly interested in mechanisms of common sleep difficulties, the impact of sleep problems on factors related to quality of life, and usefulness of sleep treatments in different populations.

Tell us about your educational background.

My undergraduate degree was in psychology. After receiving a master's degree in cognition and neuroscience, I started a doctoral program in clinical psychology at the University of Missouri and am currently in my fifth year.

What brought you to the Thompson Center?

I originally wanted more clinical experience administering assessments for neuropsychological and psychodiagnostic evaluations after graduating from my master's program. Luckily, the Thompson Center hired me as a psychometrist, and I have continuously kept coming back for either research projects or practicum training since beginning my doctoral program.

How did you first get involved with autism research?

The Thompson Center gave me my formal introduction to research with autism while still a psychometrist by providing opportunities to work on several studies with the Research Core.

What's your favorite thing about working in this field?

My favorite thing about working in this field is the people. That includes the individuals and families I have the pleasure of meeting while providing care in different settings, as well as the colleagues and mentors who consistently amaze me.

What study have you been most excited to be involved in?

The most impactful study I have been involved in thus far has been the RECHARGE sleep clinical trial. My role as a therapist on the project was exceptionally fulfilling as a clinician by allowing me to individually connect with families and observe the numerous benefits of sleep intervention. At the same time, the information I gathered as a researcher was both personally beneficial and sparked many of the questions I continue to explore as my professional career develops.

What are your plans for after your time as a trainee?

After my time as a practicum student at the Thompson Center, my immediate plan is to, hopefully, be accepted to an internship program followed by a postdoctoral fellowship position with opportunities to gain more experience in both neuropsychological assessments and autism diagnostic evaluations.

What vision do you have for your career?

Currently, I envision myself performing both neuropsychological and autism diagnostic evaluations. I also plan to conduct research in some capacity, most likely focused on better understanding sleep difficulties and the benefits of sleep interventions.

How do you think your time at the Thompson Center will influence the direction of your career?

My time at the Thompson Center has influenced most of my career direction choices since the first day I began working here and will probably continue to do so. It has given me opportunities to see providers conducting multiple types of clinical evaluations of professional interest, to be involved in various research activities that have sparked my curiosity, and to obtain invaluable guidance from many gracious mentors as my career path has taken shape.

Student, Trainee, and Early Professional Poster Session Winners

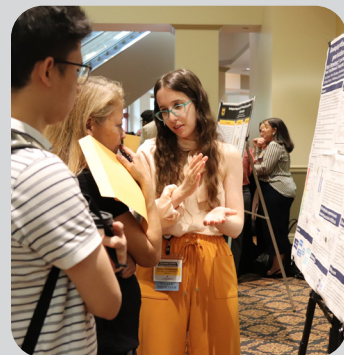


Congratulations to the winners of this year's Student, Trainee, and Early Professional Poster Session (STEPP) at the 2024 Thompson Center Autism Conference!

First Place: **Braden Hayse** - "Ecological Momentary Assessment of Anxiety and Depression Symptoms in Individuals with Phenylketonuria" (top left) & **Katie Blount** - "Genetic Testing in Neurodevelopment: Diagnostic Yield of Whole Exome vs Chromosomal Microarray" (top right)

Second Place: **Sneha Chaturvedi** - "Investigating Sex-Specific Neurodevelopment through Cerebrospinal Fluid Metabolomics" (lower left)

Third Place: **Mariam Gachechiladze** - "Developing Antisense Oligonucleotide Therapeutics for Restoring Gene Function in MYT1L Neurodevelopmental Disorder" (lower right)



New Insights from Infant Cry Study

The Early Years Study is a project that analyzes audio recordings of infant cries to discover new ways to identify early signs of autism and developmental disabilities. The Thompson Center joined this study in late 2022 and so far has collected over 1,200 unique infant cry recordings.

The study has been analyzing mothers' perceptions of their infant's cries in real-time. Mothers will rate their child's cries on a four point scale of typicality or distress. The study has found that different characteristics of the mother can affect how cries are perceived. With the current data collected, mothers who presented with higher levels of **subclinical autism traits** rated their infants' cries as more typical. For example, a mother from this category could have rigid tendencies and have sensory differences, and they would perceive their infant's cries as more typical. Mothers of older children with autism rated their infant's cries as less typical and first-time mothers rated their child's cry as more distressing.

What are **subclinical autism traits**?

When evaluating for an autism diagnosis, many traits are considered: difficulty with verbal and nonverbal communication, rigid behavior, aloofness, special interests, and more. It's the combination of these characteristics that make up autism, and any of these traits can be present in someone without autism. After all, autistic traits are human traits!

When these characteristics are present in a person that does not have autism, they are considered **subclinical autism traits**.

This study has also gathered data about the connection of subclinical autism traits between each child's parents. Researchers analyzed the parents' scores on an evaluation used to assess subclinical autism traits. These comparisons found that autism-related characteristics identified in one parent are likely to be seen in the other parent. This initial data suggests that individuals may subconsciously seek out partners with similar traits as them, which may have contributed to the rise in autism diagnoses over the past 20 years. A better understanding of this connection of subclinical autism traits in parents could lead to a more comprehensive autism assessment in their children by being able to look at the parent's traits as a potential indicator.

A unique aspect of this study is that the data can be collected remotely. Mothers submit their child's cries through an app and rate the cries. As the children are followed into their third year of life, mothers respond to periodic online surveys about their children's development and behaviors. The online surveys are parent-report forms often used by pediatricians during well-child visits. Initial analysis of the data collected from these online surveys of more than 300 infants indicate that the temperament of the infant reported by the mother at nine months can predict the social communication and sensory regulatory behaviors related to autism that is reported at 12 months.

This study aims to find practical tools that can be used by pediatricians for early autism detection. Findings from this study could allow for earlier and quicker diagnoses, giving parents and families access to services sooner.

Recent Publications

Barral, R. L., Clark, N. A., Zapata, F., Vargas Collado, L. M., Cuevas, J. J., & Fernandez, C. (2024). Combating Disparities in a Pandemic: Increasing Dissemination of Coronavirus Disease 2019 Resources in Spanish. *Pediatr Qual Saf*, 9(4), e744. <https://doi.org/10.1097/pq9.0000000000000744>

Beversdorf, D.Q., Ferguson, B., Hunter, S. et al. Randomized controlled trial of propranolol on social communication and anxiety in children and young adults with autism spectrum disorder. *Psychopharmacology* 241, 19-32 (2024). <https://doi.org/10.1007/s00213-023-06452-1>

Brown, C. E., Collins, T., Foy, R. K., Bonish, K. E., Ramsey, T. E., Nowell, K. P., Bernardin, C. J., & Kanne, S. M. (2024). Correction: The How Rather than the What: A Qualitative Analysis of Modalities and Caregiver Descriptions of Special Interests in Autistic Youth. *J Autism Dev Disord*, 54(11), 4355. <https://doi.org/10.1007/s10803-024-06552-7>

Check, J., Shuster, C., Hofheimer, J., Camerota, M., Dansereau, L. M., Smith, L. M., Carter, B. S., DellaGrotta, S. A., Helderman, J., Kilbride, H., Loncar, C. M., McGowan, E., Neal, C. R., O'Shea, T. M., Pastyrnak, S. L., Sheinkopf, S. J., & Lester, B. M. (2024). Preeclampsia, Fetal Growth Restriction, and 24-Month Neurodevelopment in Very Preterm Infants. *JAMA Netw Open*, 7(7), e2420382. <https://doi.org/10.1001/jamanetworkopen.2024.20382>

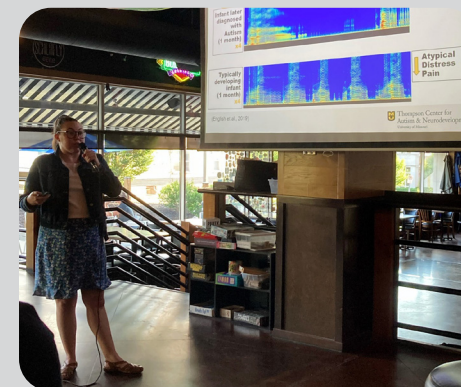
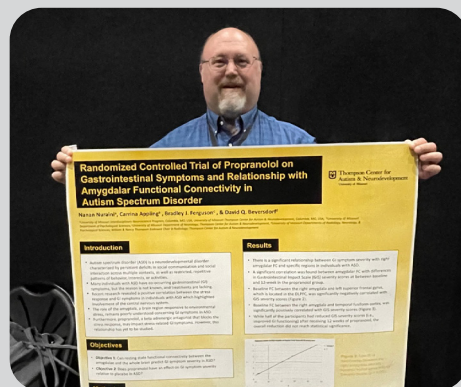
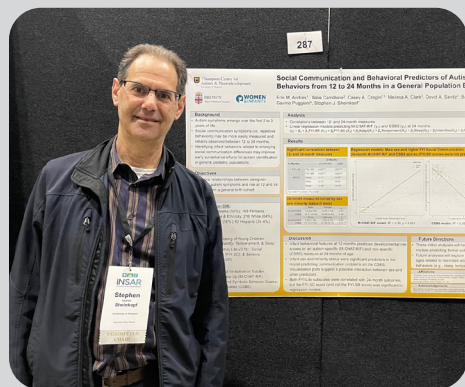
Saletin, J. M., Koopman-Verhoeff, M. E., Han, G., Barker, D. H., Carskadon, M. A., Anders, T. F., Sheinkopf, S. J., Rhode Island Consortium for Autism, R., & Treatment. (2024). Sleep Problems and Autism Impairments in a Large Community Sample of Children and Adolescents. *Child Psychiatry Hum Dev*, 55(5), 1167-1175. <https://doi.org/10.1007/s10578-022-01470-0>



Want to see more from Thompson Center researchers?

Scan the code or visit <https://thompsoncenter.missouri.edu/publications/> for a full list of studies by Thompson Center authors and links to each publication.

Researchers On The Go



1. Dr. Stephen Sheinkopf at the International Society of Autism Research (INSAR) conference in Melbourne, Australia
2. Dr. David Beversdorf at INSAR
3. Dr. Kerri Nowell at INSAR
4. Dr. Erin Andres sharing her research at Science on Tap in Columbia, MO
5. Research Core staff recruiting for studies at the Centralia, MO public library

Join A Study

fNIRS

The purpose of this research study is to examine verbal and nonverbal communication in Autism Spectrum Disorder (ASD).

- Eligibility: Age 5-10 with and without a diagnosis of ASD
- Time required: One visit lasting approximately 3 hours
- Location: Thompson Center
- Monetary compensation: \$50

MapLight

Participate in a clinical trial exploring the potential effects on social communication and other behaviors.

- Eligibility: Age 12-45 with a diagnosis of ASD AND participation of a parent/guardian
- Time required: Up to 10 visits and 1 phone call over approximately 25 weeks
- Location: Thompson Center
- Monetary compensation: \$50 per completed visit

Early Years

The goal of this research study is to learn about how behaviors observed in newborns relate to meeting developmental milestones during the first years of life.

- Eligibility: Expectant parents age 18+
- Time required: Participants will submit newborn cry recordings and complete online surveys about baby's development through age 3
- Location: Online surveys, some families will be invited to the Thompson Center
- Monetary Compensation: Up to \$265

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 will be the largest autism research study to date.

- Eligibility: Diagnosis of ASD
- Time required: Complete a few questionnaires, provide a saliva DNA sample using collection kits sent directly to your home
- Location: Online surveys
- Monetary compensation: Gift card up to \$50

Biomarker Study

The goals of this study are to: 1. Gather additional information on subpopulations of autism spectrum disorder as identified by the Sponsor and 2. Learn more about autism spectrum disorder by identifying subgroups of patients with autism based on biomarkers. Biomarkers are also known as "biological signs" that can be linked to a condition and how it progresses.

- Eligibility: Age 12-45 with a diagnosis of autism spectrum disorder AND participation of a care/study partner, such as a parent or spouse
- Time required: One visit lasting approximately 3 hours
- Location: Thompson Center
- Monetary compensation: \$100 per completed visit, meal voucher, and travel compensation

Eye Tracking Study

This study will examine if a new investigational medical device can be used to diagnose autism in children ages 31-84 months. This study is looking at whether the device can give comparable results to current diagnostic tests performed by clinicians.

- Eligibility: Children ages 2.5-7 years with concern for autism or typically developing
- Time required: One study visit will take approximately 4 hours
- Location: Thompson Center
- Monetary Compensation: Up to \$60

Interested in these studies or others?

Call the Research Core at 573-303-8405, email tcresearch@missouri.edu, or scan the QR code to learn more.



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