

Neurodevelopmental Diversity Lab

INSIDE THE RESEARCH

Thank you so much for your continued support of the Neurodevelopmental Diversity Lab at Northwestern! Our achievements would not be possible without your dedication to our research. From starting new grants to welcoming new team members, we're excited to share with you our recent updates from the lab!



A New Chapter: Neurodevelopmental Diversity Lab

We are happy to introduce our new lab name, the "Neurodevelopmental Diversity Laboratory." This new name reflects our commitment to celebrating neurodiversity, and the different ways in which people experience and interact with the world around them. We believe this new name aligns strongly with our values and research mission to understand the underlying biological influences on complex human traits, such as language, cognition, and communication.

Thank you for being a part of our lab's mission and NIH-funded projects aimed at better understanding neurodiversity.

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Research Updates and Announcements



Studying Language Use in Autistic Females

The overwhelming majority of studies exploring language differences have focused largely on male participant groups, with very few studies devoted to understanding social communication and related clinical-behavioral outcomes in autistic females.

Our project aims to address this research critical gap by focusing specifically on females to understand how language traits in autism might be expressed differently in males and females and how they relate to social interactions and well-being. Findings from this work may have important clinical implications for recognition and support for autistic females, who may be underserved in current clinical frameworks.

Extending our Research: Social Communication Traits in FMR1 Premutation Carriers

This study builds on a larger NIH-funded project in the lab to study how motor-speech characteristics might relate to the FMR1 gene, which causes fragile X syndrome and is associated with autism. The project focuses on carriers of the FMR1 premutation to understand the different skills that contribute to social communication and how they may be linked to neurobiological and molecular-genetic factors. Outcomes of the study may have significant clinical-translational implications, benefiting both the autism and FMR1 communities and paving the way for precision medicine approaches for supporting social communication skills.

We are actively recruiting participants for our current projects! Please be in touch if you are interested in participating in new projects and help us to spread the word! Currently, we are actively recruiting both males and females with autism and their parents, individuals with fragile X syndrome, and individuals who carry the FMR1 premutation. Importantly, to complete our studies we also need to recruit individuals without autism or fragile X, as well as their parents. Sharing our lab and study information with your friends and local communities will help us to meet the goals of our NIH-funded research and answer critical questions about autism and FMR1 conditions. Family support is the most critical factor in the success of the research we do, and we are so grateful for your partnership!

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Recent Developments

NDL at the Midwest Fragile X Research Exchange

The Midwest Fragile X Research Exchange is an annual gathering of Midwestern-based researchers who study fragile X syndrome and the FMR1 premutation. This year, research teams gathered at Rush University to share new resources and findings, enhance and explore collaborations, and discuss the direction of future research in the field.

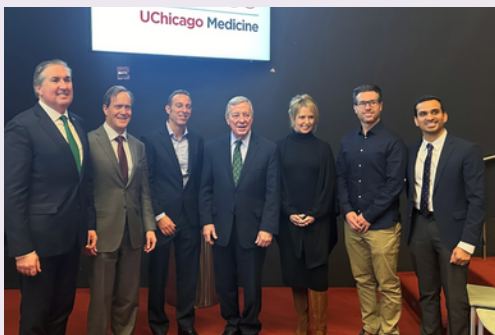
Two of our lab members were featured as presenters!

Research Assistant Professor, Joe Lau, presented his research using artificial intelligence-based models to characterize language in fragile X syndrome and was given a best poster award by the conference organizers!

Ph.D. student, Stephanie Crawford, presented findings from her dissertation research examining audio-vocal integration in women who carry the FMR1 premutation - specifically, how we process and adjust speech when we hear changes in the pitch of our own voice. Early findings showed that women who carry the FMR1 premutation display a tendency to overcorrect speech in response to altered auditory feedback, suggesting that variation in the FMR1 gene can impact pitch processing and vocal pitch production. This is an important finding with implications for understanding the ways in which the FMR1 gene can influence complex functions like speech perception and production, even very subtly and among individuals without any clinically significant features or developmental delays.



NDL in the Community



Illinois Senator Dick Durbin recognized our newly funded NIH grants in his December 6, 2024 [press conference](#) highlighting Biomedical Research in Illinois. Dr. Losh was a featured speaker at the event, which showcased recent NIH grantees and underscored the importance of Durbin's American Cures Act, to support robust and sustained NIH funding for biomedical and scientific research. We were honored to have our research recognized by Senator Durbin!



The NDL was honored to attend the 2024 Chicago ArtTism event at the DuSable Black History Museum and Education Center. ArtTism is dedicated to transforming the narrative around autism within the black & brown communities through the celebration of art. We had the opportunity to share information about our autism studies and listen to talks from individuals in the Chicago autism community.

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Recent Developments

Welcoming Visitors and Collaborators to the NDL



Collaborators from the University of Sydney Brain and Mind Centre visited Northwestern and the NDL to discuss ongoing efforts to establish targeted, interdisciplinary research projects amongst faculty at their university. Our lab helped host the USYD visitors to collaborate on multidisciplinary approaches to understanding and remediating neurodevelopmental conditions in children by integrating genetic, neurochemical, medical, psychological, and neuroimaging data, along with clinical and social support networks.



Professor Catherine So from The Chinese University of Hong Kong visited the NDL to share her work using robot-based interventions to enhance social and communicative abilities in autistic individuals and facilitate societal inclusion. Members of the NDL had the opportunity to engage in a luncheon and discussion with Dr. So. During this time, they explored cross-cultural differences in the diagnosis and treatment of autism in preparation for the NDL's forthcoming study on language abilities and related traits in autism across English and Cantonese speakers.



This summer, we were happy to host our community partners, Little Friends, at Northwestern for a day full of community-oriented conversations and research talks. Thank you for joining us, and we look forward to continuing our collaborative relationship!

Lab Retreat!

We had a great time at our 2024 Lab Retreat! It served as an important opportunity to come together, share insights on our exciting new projects, brainstorm future aims, and foster collaboration. We wrapped up the day with some fun games, celebrating the arrival of Fall, and the start of a promising academic year!



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Meet our Intern, Sabrina!



During Fall 2024, Sabrina Sacks completed an internship with the NDL through Have Dreams, an organization that provides resources and support for autistic individuals, including employment training. Prior to working in the NDL, Sabrina graduated in May 2024 with a major in biology and a minor in music from the University of Tulsa. At college, Sabrina shared that she was passionate about her classes, which made it easy for her to learn. She experienced some challenges with making new friends, adjusting to living on her own, and learning good study habits. After graduating from college, she moved to Illinois and joined the Have Dreams program to participate in their workforce training program.

At Have Dreams, Sabrina developed valuable skills in self-advocacy, resume writing, and applying for jobs. At the NDL, Sabrina scanned and organized data for our electronic database, summarized research articles, and presented topics of scientific interest to the lab. Sabrina hopes to get a job in biology, preferably researching insects or arachnids. She has many strengths including that she is kind, funny, analytical, and a fast learner. Sabrina enjoys playing video games, making art, and creating videos. When asked what advice she would give to other autistic individuals who are applying for jobs, Sabrina said, "Try not to get discouraged. Treat every interview as a learning experience, and don't be hard on yourself."

We loved having Sabrina at the NDL and are grateful for her many contributions to our research!

Welcoming New Lab Members



Hannah joined the NDL as a research project assistant in July of 2024. While growing up in Chicago, Hannah led a soccer program for children with physical and neurodevelopmental disabilities. After graduating from the University of Michigan with a B.S. in Biopsychology, Cognition, and Neuroscience, she spent the last year working as a medical scribe at Northwestern Memorial Hospital. As a research assistant, Hannah recruits participants across projects and plays a large role in coordinating visits with participants and their family members. Much of her work involves working directly with our participants to collect important clinical, neural, and conversational data for our projects. Hannah is excited to continue enhancing her research experience and supporting her fellow team members at the NDL.



Dante is a first-year Clinical Psychology Ph.D. student whose commitment to studying neurodevelopmental conditions was inspired by growing up alongside neurodivergent family members with autism and fetal alcohol spectrum disorder. As an undergraduate at the University of Minnesota, he gained research experience in pharmacology, neuroscience, and psychology, working with both mouse models and diverse human populations. After earning a B.S. in Psychology with minors in Neuroscience and Communication, he honed his research and clinical skills studying gene-brain-behavior connections and intervention outcomes in children with rare genetic conditions. In the NDL, Dante is investigating the neuropsychological and genetic basis of language differences in autism and fragile X syndrome. As a committed advocate for Diversity, Equity, and Inclusion (DEI), Dante mentors students of marginalized backgrounds and actively participates in DEI-focused organizations.



Alicia is a first-year Ph.D. student in Communication Sciences and Disorders. Alicia's passion for studying communication in children can be traced back to her senior year of high school in Chicago when she started her research on the Deaf community and milestones for children from diverse backgrounds. This experience sparked her curiosity about human development, communication differences, and neurodiversity. Alicia graduated from the University of Illinois Urbana-Champaign with a B.S. in Speech and Hearing Science and completed her M.S. in Applied Behavior Analysis from The Chicago School. For Alicia, opening our minds to behavioral and related sciences will expand opportunities to create bridges between areas where there are limited or out-of-scope approaches, and provide comprehensive care. Alicia's specific interests include understanding verbal behavior and its connections to neurology and neurodevelopmental conditions impacting communication.

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