

Connecting Minds • Advancing Neuroscience • Improving Lives

Advancing Early Detection and Treatment of Autism

The Duke Institute for Brain Sciences (DIBS) facilitates innovative science by engaging world-class faculty from multiple disciplines to address pressing real-world issues. One of those issues is autism spectrum disorder (ASD), a neurodevelopmental disorder affecting one in 59 children, causing difficulties with communication and behavior. Diagnosis is possible as early as 18 months, but occurs, on average, closer to age 5 or 6 years, causing many children to miss out on early interventions.

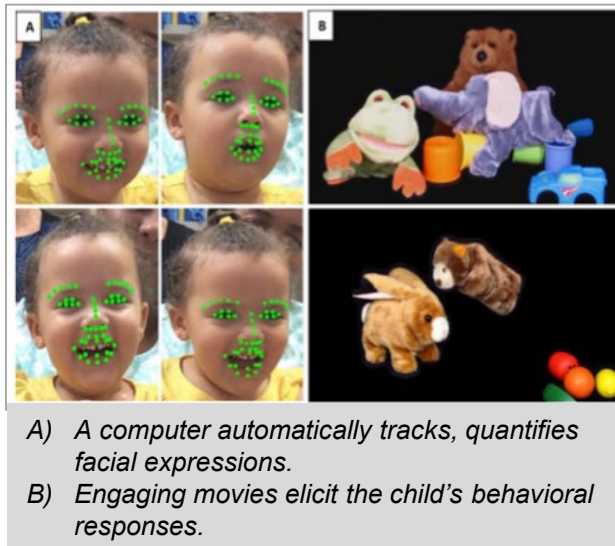
Researchers at the Duke Center for Autism and Brain Development, supported by DIBS, study how to diagnose the disorder earlier, allowing children to benefit from the newest therapies. The Center also seeks to develop new and more effective treatments. Several clinical trials are testing new treatments ranging from cellular and molecular approaches to teaching parents ways to help their children cope with communication difficulties.

App Aims to More Accurately Detect Autism

Geraldine Dawson, PhD, directs DIBS and the Duke Center for Autism and Brain Development, and specializes in the early detection and treatment of young children with ASD. Dr. Dawson has been co-leading a ground-breaking interdisciplinary program with Guillermo Sapiro, PhD, James B. Duke Professor of Electrical and Computer Engineering in the Pratt School of Engineering, an expert in computer imaging and machine learning.

One barrier to early detection is that current screening tools rely on a brief questionnaire and don't involve directly observing symptoms, which leads to inaccurate results. To address this challenge, Drs. Dawson and Sapiro have created a digital autism screening app that is administered on an iPhone or iPad and delivered during an infant or toddler's routine well-child check-up. The

camera in the device records the child's responses to brief engaging movies. Then, computer vision analysis is used to automatically code behaviors that are early signs of autism, including facial expressions and movement patterns. The team is currently validating this tool with thousands of infants and toddlers in Duke primary care clinics. The goal is to develop a scalable, more accurate screening tool.



A) A computer automatically tracks, quantifies facial expressions.
B) Engaging movies elicit the child's behavioral responses.



'When I was in graduate school, I was taught that autism could not be detected until a child was 3 years old. We knew very little about its causes and had little to offer in terms of effective treatments.'

Since then, we've made tremendous strides in understanding autism, diagnosing it earlier, and providing better therapies.

DIBS has played an important role in my professional journey, helping recruit me and other faculty to Duke; providing access to advanced lab and clinical facilities; and supporting autism research.'

—Geraldine Dawson, PhD

William Cleland Distinguished
Professor of Psychiatry
& Behavioral Sciences

Director, Duke Institute for Brain
Sciences, and Duke Center for Autism
& Brain Development

Autism Clinic Providers Offer Treatment, Support

The Duke Autism Clinic, part of the Duke Center for Autism and Brain Development, sees hundreds of individuals with autism and their families throughout the year. The Clinic provides comprehensive assessment, diagnosis, treatment, and ongoing behavioral and medication consultation for children, adolescents, and adults with autism spectrum disorder. An interdisciplinary team of clinical psychologists, social workers, physicians, and others provide personalized clinical services in a caring environment.

One physician, Tara Chandrasekhar, MD, has a special interest in helping people on the spectrum navigate the transition from adolescence to adulthood. She founded Neurodiversity Connections at Duke to raise Awareness of neurodiversity on campus. "We're creating the connections and knowledge base so we can be more effective in helping students on the spectrum," she said.



Outreach Helps Inform the Public

DIBS and the Duke Center for Autism collaborate on annual events to help enhance the public's awareness of ASD:

Autism Awareness Month

Each April, DIBS and the Center for Autism host a special lecture featuring an inspiring speaker with personal experience with autism spectrum disorder. For the 2019 Autism Awareness Month event, The Honourable Mike Lake, member of Canada's Parliament, brought his adult son, Jaden, who is on the spectrum. In his presentation, "Expect More: An Autism Adventure," Mr. Lake described Jaden's life as he has grown into a young man, able to travel with his dad as they advocate for those with disabilities.



DIBS Discovery Day

In the spring, we organize a fun-filled afternoon of brain-related "discovery." Children and parents color and make brain hats, explore exhibits by Duke's Bass Connections Brain & Society teams and the Duke Center for Autism, try out a microscope, and touch a human brain. The 2019 event featured a "sensory-friendly," pre-event hour for those needing a less stimulating environment. This event allows graduate students and postdoctoral associates at the Center to connect with members of the public and explain their research.



Jordan Hashemi, PhD, Postdoctoral Associate, Duke Center for Autism and Brain Development, in the blue shirt, explains to Discovery Day visitors how technology can help children on the spectrum learn how to recognize emotional cues, a skill that is often difficult for them.



The Duke Center for Autism and Brain Development was awarded \$12 million from the National Institutes of Health to create an NIH Autism Center of Excellence. The five-year grant program funds research on autism and attention deficit hyperactivity disorder, seeking to improve screening, assessment, diagnosis, and treatment of young children.

Help DIBS Expand Autism Research, Education, Outreach!

Help us make it possible for more faculty and students to conduct innovative research, experience outstanding education, and participate in meaningful outreach to address real-world issues such as autism spectrum disorder. To support the inspiring work at DIBS, please contact:

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