





Pictured from left, the A.J. Drexel Autism Institute's research program area leaders Dr. Paul Shattuck, Dr. Diana Robins, and Dr. Craig Newschaffer.

Welcome

Greetings all. Thank you for your interest in the A.J. Drexel Autism Institute. As you know, our focus is applying public health science to address the challenges posed by autism for individuals, families and communities. We focus on preventing impairment and enhancing quality of life with an eye toward studies that produce findings that apply broadly.

In this report, we will highlight the work of the Institute's stellar early career researchers. New investigators are critical to bringing fresh perspectives and new methodologies to the work that we do and, at the Institute, we are most fortunate to have assembled an amazingly committed and talented group. Although still at the beginning of their careers, a number of the scientists you will read about have already made substantial contributions and currently have their work supported by prestigious National Institutes of Health (NIH) early career awards or other federal or foundation funding.

Overall, last year was another successful one for the Institute and one that ended on a very high note with each of our research programs launching major new initiatives. Dr. Diana Robins' Early Detection and Intervention Program received a NIH Autism Center of Excellence award to conduct an unprecedented multisite randomized trial of the combined effects of early screening with behavioral treatment. (This makes Drexel only the third university to receive more than one of

these prestigious centers of excellence awards.) Dr. Paul Shattuck's Life Course Outcomes Program, with new funding from the Health Services and Resources Administration, is assembling a vast array of data on transition age youth with autism to understand the complex interplay of systems, service, and individual factors that predict success in order to inform much needed changes in public policy. Finally, the Modifiable Risk Factors Program that I lead developed a large multisite collaborative project that is a part NIH Office of the Director's Environmental Influences on Child Health Outcomes (ECHO) initiative. ECHO is a landmark network of studies across the country whose combined size and scope should help surmount the challenges currently faced by researchers in revealing environmental influences on healthy brain development.

I look forward to reporting on the outcomes of these new projects in future annual reports. What you will read about in this report, however, is the innovative thinking that will undergird the Institute's major projects yet to be developed. So consider this a glimpse into the Institute's future – hopefully, a future where the work of today will have already helped reduce impairment, lower barriers, and create opportunities for those on the autism spectrum.

— **Dr. Craig Newschaffer**

What we do

The A.J. Drexel Autism Institute launched in 2012 as the first research organization dedicated to bringing a public health approach to understanding and addressing the challenges of autism spectrum disorders. The Institute's interdisciplinary team of world-class researchers explores autism's characteristics, causes and consequences in order to develop community-based action to improve the quality of life for individuals of all ages with autism. Our research is rooted in the community and involves diverse populations; the science is broad-based, with our team including epidemiologists, psychologists, environmental health scientists, sociologists, and health and education policy research specialists.

Who we are

The Institute is structured around three research programs and one center that work together to discover avoidable causes, identify symptoms and effective interventions as early as possible, and promote quality of life for those living with autism.



MODIFIABLE AUTISM RISK FACTORS RESEARCH PROGRAM
discovers exposures or behaviors that if reduced, eliminated or changed would lower autism spectrum disorder disability, impairment and morbidity.
Leader: Dr. Craig Newschaffer. Faculty: Dr. Kristen Lyall and Dr. Nathaniel Snyder



EARLY DETECTION AND INTERVENTION RESEARCH PROGRAM
links early detection with early intervention research. Researchers evaluate methods of improving screening, diagnosis and treatment to children in the community and ways to adapt existing interventions to the needs of underserved children and families.
Leader: Dr. Diana Robins. Faculty: Dr. Connor Kerns and Dr. Giacomo Vivanti



LIFE COURSE OUTCOMES PROGRAM
improves quality of life for people on the autism spectrum and their families by informing and assessing programs, policies and support systems.
Leader: Dr. Paul Shattuck. Faculty: Dr. Elizabeth McGhee Hassrick and Dr. Collette Sosnowy



POLICY AND ANALYTICS CENTER
supports the development of effective social and health policy in cities, states, and across the United States.
Leader: Dr. Lindsay Shea

How we help

“The work of our new investigators is setting the stage for what the Institute will be a decade from now; the potential for this science to change lives is tremendous.”

— Craig Newschaffer, director, A.J. Drexel Autism Institute

Responding to Autism in Communities: Focus on the Justice System and First Responders

National news and local crises have reported that first responders, including police officers, may not be prepared to understand how autism may present in a crisis or how to take the first steps to help. Dr. Lindsay Shea’s team at the Policy and Analytics Center (PAC) gathered statewide data in Pennsylvania and found that people with autism were interacting with police more often, increasing the importance of making sure police were prepared. A statewide survey of justice system professionals found they wanted additional resources and training to prevent unnecessarily expensive and traumatic experiences among people with autism, including hospitalization and jail time.

Consequently, the PAC under the Autism Services, Education, Resources and Training Collaborative (ASERT) and Philadelphia Autism Project are focused on identifying gaps, generating resources, and conducting trainings to prepare both people with autism and their families as well as police and other first responders for these interactions.

“The trainings conducted with Philadelphia police officers as well as justice, child welfare, firefighters, hospital personnel, and other first responders in Philadelphia and across Pennsylvania paired with the resources for people with autism and their families help work toward being proactively prepared for these interactions, on both ends,” Dr. Shea says.

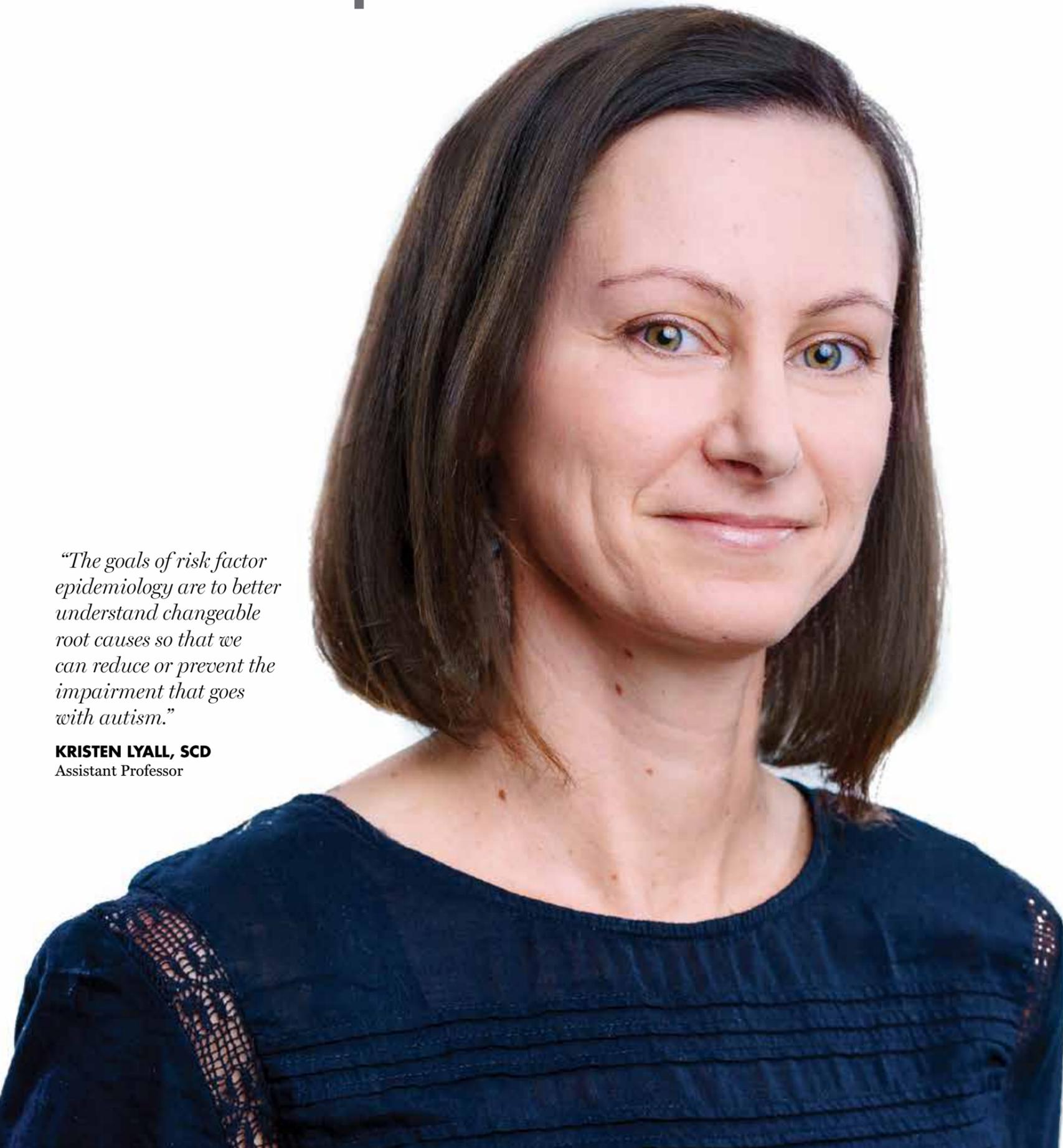
A number of the resources developed can be viewed at paautism.org/justice

“The trainings conducted with Philadelphia police officers as well as justice, child welfare, firefighters, hospital personnel, and other first responders in Philadelphia and across Pennsylvania paired with the resources for people with autism and their families help work toward being proactively prepared for these interactions, on both ends.”

LINDSAY SHEA, DRPH, MS
Director of the Policy and Analytics Center



How we help



“The goals of risk factor epidemiology are to better understand changeable root causes so that we can reduce or prevent the impairment that goes with autism.”

KRISTEN LYALL, SCD
Assistant Professor



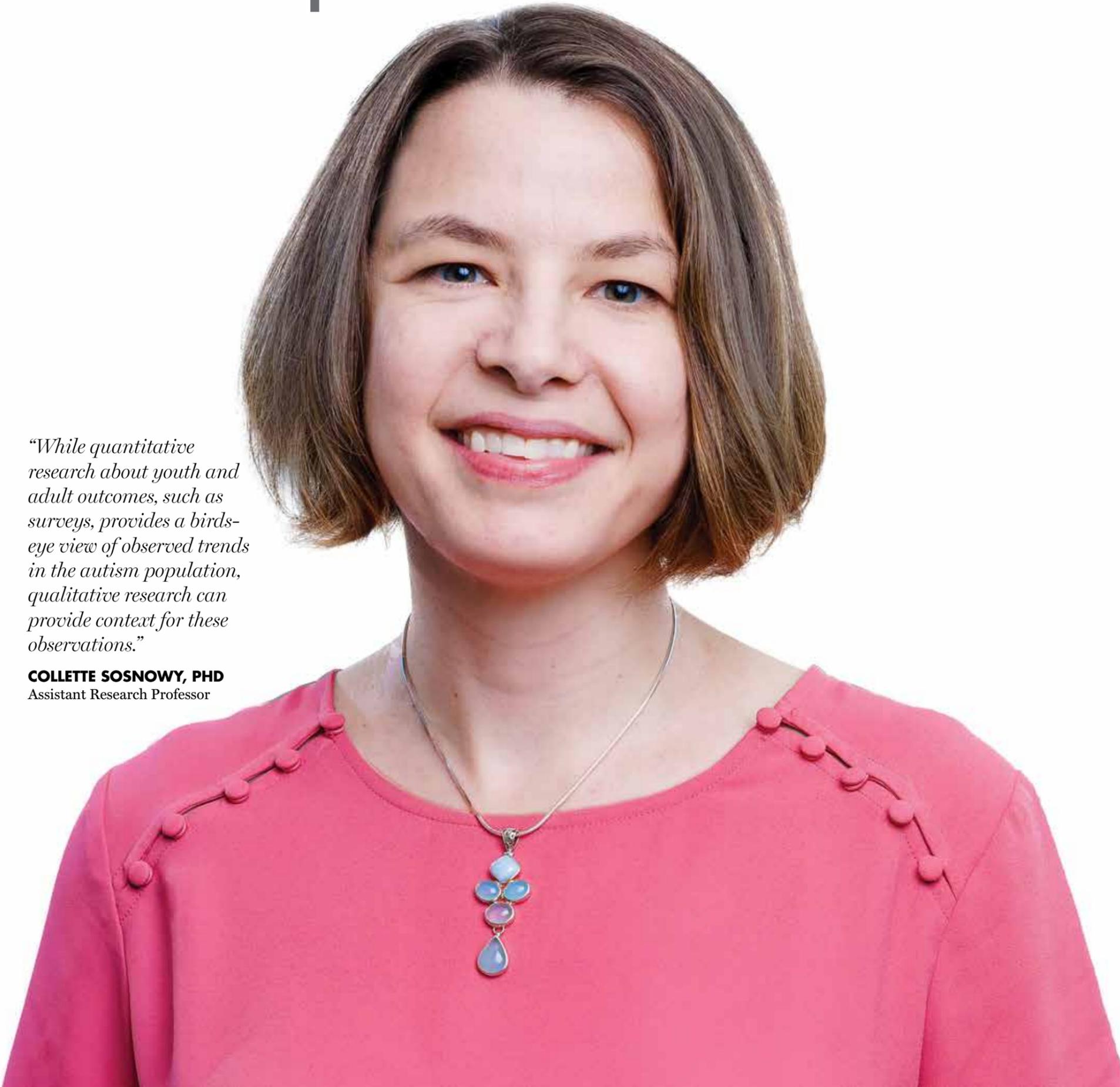
Exploring how dietary factors might influence autism risk

Over the past decade the field of epidemiology has begun to generate more clues about risk factors for ASD. Dr. Kristen Lyall has begun a novel study that will be one of the first to look at prenatal levels of the polyunsaturated fatty acids (PUFAs) that are critical to brain development in relation to autism risk. Maternal diet is the main source of PUFAs for the developing brain.

Dr. Lyall’s study follows 500 moms of children diagnosed with autism and 500 moms of a control group of children without autism to examine the role of these and related dietary factors in neurodevelopment. She is taking the science to the next level by measuring PUFAs in blood samples from mothers collected during pregnancy, rather than simply using reported diet as in previous work.

The project is laying the groundwork for future investigations of maternal dietary factors that may impact ASD risk, and could ultimately yield more detailed dietary recommendations for pregnant women. “The goals of risk-factor epidemiology are to better understand changeable root causes, so that we can reduce or prevent the impairment that goes with autism,” Dr. Lyall says.

How we help



“While quantitative research about youth and adult outcomes, such as surveys, provides a birds-eye view of observed trends in the autism population, qualitative research can provide context for these observations.”

COLLETTE SOSNOWY, PHD
Assistant Research Professor



Measuring outcomes for youth with autism after high school

Dr. Collette Sosnowy recently completed a qualitative study called “Measuring What Matters” about outcomes after high school for young adults with autism. “While quantitative research about youth and adult outcomes, such as surveys, provides a birds-eye view of observed trends in the autism population, qualitative research can provide context for these observations,” she says. Dr. Sosnowy and her team conducted in-depth interviews with young adults on the spectrum, as well as their parents, asking about their experiences transitioning out of high school, current activities, hopes and expectations for the future, and what they need to help them succeed. Her study has illustrated that young adults, parents and service providers view outcomes as complex, dynamic concepts rather than fixed indicators. For many young adults, there are limited services following high school. Participants said that services that were available often were not the right fit for a young adults’ needs. The most effective services were those that could be individualized for the young adult and young adults with autism, parents and service providers employed a number of informal strategies to fill in gaps.

With a half million people on the spectrum aging into adulthood over the next decade, it’s important to understand the specific challenges for this unique and diverse population. This research can identify factors to target for improvement, ultimately informing policies and practices that help youth and young adults with autism thrive and achieve their goals.

How we help



“Eye tracking is the closest we can get to seeing the world from the point of view of children with ASD, and understanding how they feel in response to what they see.”

GIACOMO VIVANTI, PHD
Assistant Professor



Eye-tracking and educational interventions

In many areas of health care, technology allows physicians to tailor treatments to the needs of the individual; however, there is no technology doing this for autism. Dr. Giacomo Vivanti hopes that eye tracking — which measures what people are looking at or eye movements— will change that.

The Improving Child-Treatment Fit in Autism Early Intervention Study focuses on the question of “what works for whom.” Dr. Vivanti will be working with local early intervention centers to determine if eye-tracking technology can help match children with autism to the most appropriate evidence-supported educational interventions. “Eye tracking is the closest we can get to seeing the world from the point of view of children with ASD and understanding how they feel in response to what they see,” says Dr. Vivanti.

Dr. Vivanti will use the eye-tracking technology to understand where children direct their attention and how they respond emotionally to different teaching approaches.

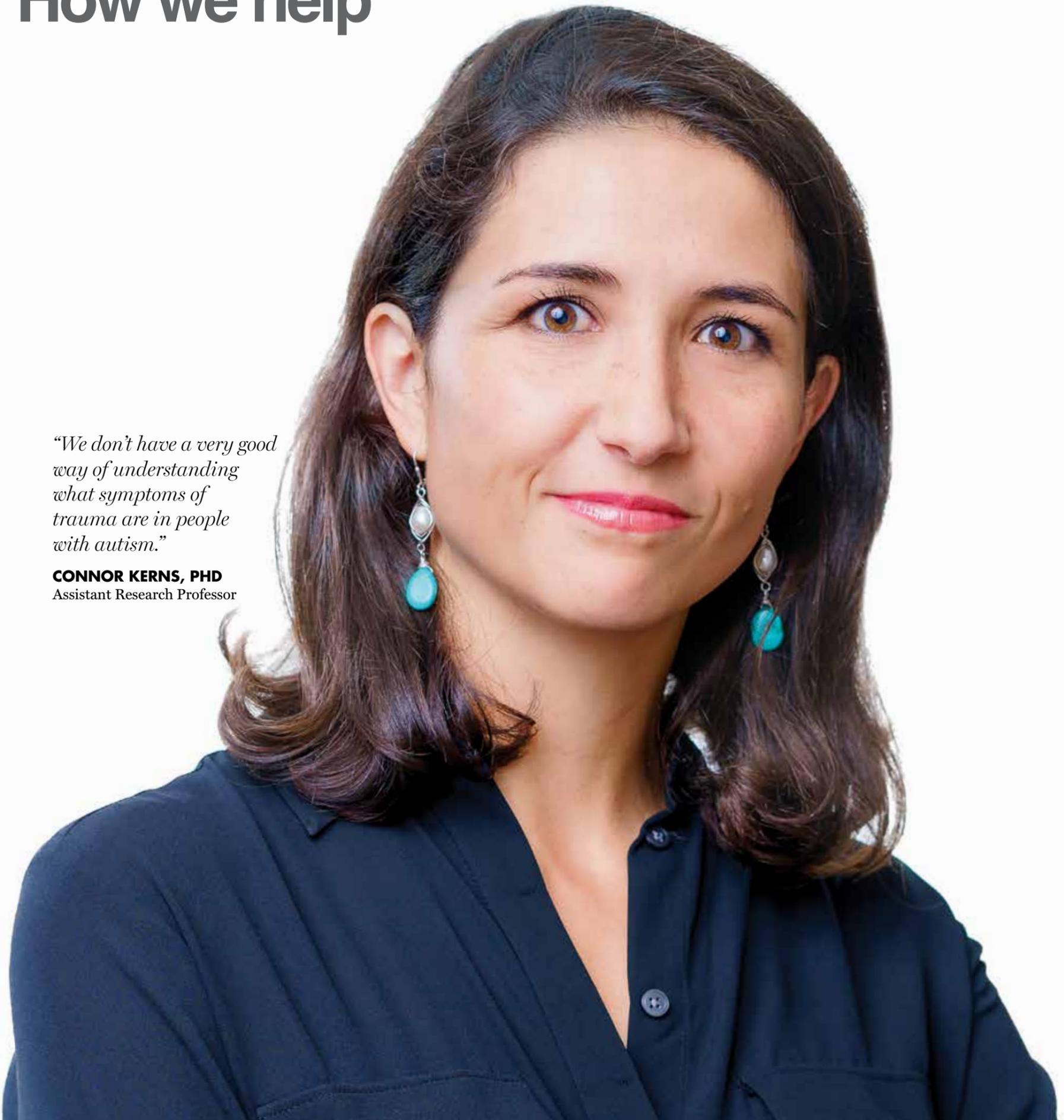
His research team will use this information to generate a learning profile for each child that includes information on the kinds of situations that seem to facilitate optional learning.

“If the study hypothesis is supported, the ‘child-treatment fit’ method used to assign children to different teaching approaches has the potential to help clinicians and families make more informed decisions when choosing among different educational options,” he says.

How we help

“We don’t have a very good way of understanding what symptoms of trauma are in people with autism.”

CONNOR KERNS, PHD
Assistant Research Professor



Profiling autism and trauma

Individuals with autism face considerable adversities in society. What is perceived as traumatic to individuals with ASD and how they express symptoms of trauma may differ in some ways from those without ASD. Yet, there is almost no current research on how trauma-related disorders manifest in people with autism.

“Most studies haven’t looked at trauma and autism — the ones that did report a very low rate of trauma-related disorders in the autistic population,” says Dr. Connor Kerns.

Dr. Kerns aims to bring light to this tough but important topic with a new study currently underway that investigates the kind of life events individuals with autism consider traumatic, and how this group expresses symptoms of trauma.

Dr. Kerns has already interviewed both adults with autism and parents of those on the spectrum, as well as polled clinical experts in ASD and trauma in order to better understand potential symptoms of trauma in ASD. In the next research phase, she will survey a larger group of 800 people to determine if the trends that emerged during her interviews and expert poll reflect the broader population of people on the autism spectrum. The ultimate goal is to develop an instrument that will be a better measure of trauma for those on the autism spectrum so that their trauma can be recognized and effectively treated.

How we help



“We can use meconium, alone or in combination with other more common samples like blood and urine, to develop a clearer picture of what is going on inside a developing baby.”

NATHANIEL SNYDER, PHD, MPH
Assistant Professor



Discovering the environmental factors that contribute to autism risk

Just a few short years ago, Dr. Nathaniel Snyder launched the Exposure Science Lab as part of the Modifiable Risk Factors research program. The lab focuses on measuring chemicals in the body, including those that come from the environment and those that are made internally. This complex mix of chemicals is referred to as the human “exposome.” Dr. Snyder’s lab is the only lab of its kind housed in an autism research center.

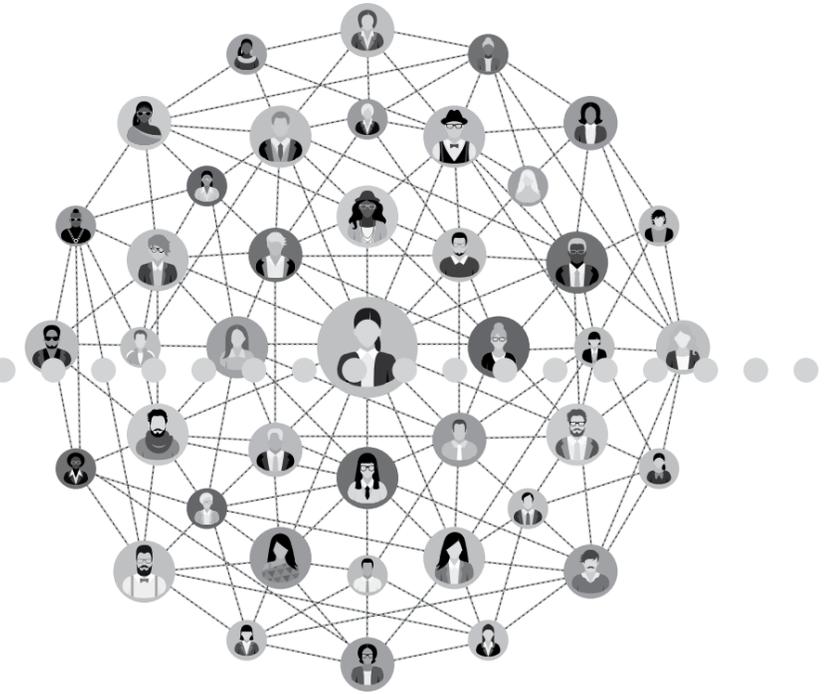
In addition to characterizing the exposome, Dr. Snyder’s lab works to learn how the exposome influences neurodevelopment. Currently, he is studying the chemical makeup of meconium, a baby’s first bowel movement. Meconium starts accumulating around the 12th week of pregnancy and is passed after birth, providing a unique time-averaged view of the chemicals reaching a developing baby during mid-to-late gestation as the brain develops. “Analyzing meconium also helps us capture exposures and gestational events that are transient but leave a lasting mark on the in utero chemical environment.”

This study has the potential to give new insights into the prenatal exposome, which could reveal parts of the largely unknown environmental contribution to autism.

How we help

“It’s exciting to have a project taking a systematic approach to measuring collaboration and support for families on the spectrum.”

ELIZABETH MCGHEE HASSRICK, PHD
Assistant Professor



Mapping support networks during times of transition

Dr. Elizabeth McGhee Hassrick and her team are deep in the midst of a project to measure and build supportive networks that bridge home, school and community, for students with autism who are transitioning from pre-K to kindergarten and from middle school to high school — times when the support systems for these children can get disrupted. “We’re using that data to characterize what transition looks like and what types of connections actually bridge the gap, and what connections don’t, as well as determining which kinds of care networks predict successful transitions,” Dr. Hassrick says.

One of the components of the study is an app that can be downloaded to a smartphone to help bridge collaboration gaps among parents and providers during transition. The app helps parents, teachers and other support professionals engage one another and share what works for the child.

“It’s exciting to have a project taking a systematic approach to measuring collaboration and support for families on the spectrum,” Dr. Hassrick says. “This could be a real missing ingredient to managing these challenging times of transition.”

Connections

Philadelphia Autism Project

Justice Resource Collection



www.paautism.org/justice

Philadelphia Autism Project

www.phillyautismproject.org/justice

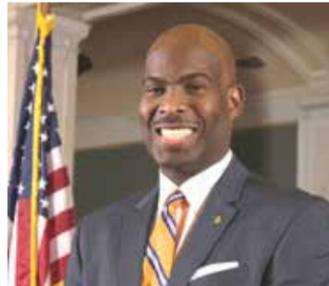


In an effort to increase the knowledge base and awareness of ASD, ASERT and Philadelphia Autism Project offers free trainings that are tailored to the specific audience. Individuals or organizations interested in a free training can contact ASERT@drexel.edu.

The Philadelphia Autism Project is a first-of-its-kind partnership between the Institute and stakeholders throughout the city such as City Council, the Department of Behavioral Health and Intellectual disAbility Services, and Community Behavioral Health. Together, these groups are implementing more than 120 initiatives to improve the lives of Philadelphians with autism. Projects include training first responders to recognize and interact with people on the spectrum and efforts to help underserved populations collaborate on autism education and outreach.

"I am extremely proud to play a continuing role in supporting the important work of the Philadelphia Autism Project. As a parent of a teenager on the spectrum, I am particularly heartened by expanded research into and services for the transition to adulthood and pathways to high-quality lives. The A.J. Drexel Autism Institute is truly a world-class research center and a vital asset in the heart of our city, advancing knowledge in ways that will create effects far beyond Philadelphia."

— Philadelphia City Councilman-at-Large Derek Green



EAGLES AUTISM CHALLENGE

EaglesAutismChallenge.org

For the Philadelphia Eagles' inaugural Eagles Autism Challenge bike ride and 5K run/walk, Drexel University's A.J. Drexel Autism Institute was named as one of the three beneficiary partners. The Institute, along with Children's Hospital of Philadelphia and Thomas Jefferson University and Jefferson Health, will receive donations toward their autism research that will be generated by the fundraising spurred by the cycling, running and walking event that will take place on Saturday, May 19, 2018.

Our Clinical Core

The A.J. Drexel Autism Clinical Core, led by Dr. Jim Connell, is made up of a team of school psychologists, licensed psychologists and behavior analysts who conduct psycho-social, behavioral and neuro-psychological assessments in support of the Institute's research. The team also partners with community organizations to provide expert trainings, consultation and program development based on evidence-based practices and interventions. Some examples of these partnerships include:

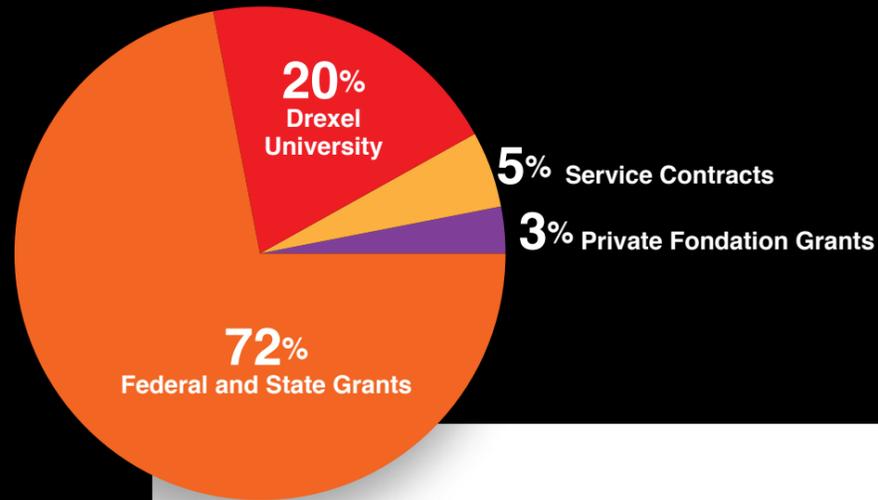
MILLVILLE SCHOOL DISTRICT IN NEW JERSEY
Providing support to classroom teachers to ensure that students with ASD are fully included in their neighborhood schools; facilitates parent support groups and helps classroom teachers in their implementation of a social skills curriculum.

PHILADELPHIA INTERNATIONAL AIRPORT
Preparing families of children with ASD to fly through supported completion of TSA security checks, flight boarding procedures, and practice in a flight simulator.

SIXERS YOUTH FOUNDATION
Developing the Sixers Creating Opportunities, Resources, and Encouragement for Youth (SCORE) Program to promote the healthy physical, socio-emotional and academic skills development of students in public middle schools in West Philadelphia and in Camden, New Jersey.



Fundraising



Grant Highlights

THE A.J. DREXEL AUTISM INSTITUTE WAS AWARDED THESE GRANTS IN FISCAL YEAR 2017.

\$2.76M awarded to **Dr. Craig Newschaffer** as part of the National Institute of Health's Environmental Influences on Child Health Outcomes (ECHO) Initiative.

\$2.5M over 5 years awarded to **Dr. Paul Shattuck** for a new cooperative agreement titled Autism Transitions Research Project.

\$518k awarded to **Dr. Kristen Lyall** from the U.S. Army Medical Research Acquisition Activity, Department of Defense for her study on prenatal polyunsaturated fatty acid levels and risk of autism spectrum disorder.

\$156k awarded to **Dr. Nathaniel Snyder** from the National Institutes of Health to study the influence of specific prenatal maternal exposures.

\$53k awarded to **Dr. Giacomo Vivanti** from the Caplan Foundation for Early Childhood Education for his "Communication in Autism Parent Coaching Program."

Thank you to supporters

On behalf of the faculty and staff of the A.J. Drexel Autism Institute, we would like to thank our donors and supporters for their generosity this past year. With your support, we are able to advance groundbreaking research that serves not just those here in the Philadelphia region, but around the world. Your support allows our team of scientists, researchers and clinicians to work towards changing the face of autism every day.

Federal Sponsors

National Institutes of Health
 National Institute of Child Health and Human Development
 National Institute of Environmental Health Services
 National Institute of Mental Health
 National Institute of Neurological Disorders
 National Science Foundation
 Centers for Disease Control and Prevention
 Department of Defense
 Department of Education
 Health Resources and Services Administration

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Autism Speaks
 Caplan Foundation for Early Childhood
 Charles and Barbara Close Foundation
 D.R.E.A.M. Partnership
 La Trobe University, Australia
 Lurie Family Foundation
 Major Anonymous Donor
 Organization for Autism Research

And a final special thanks to the families from the Philadelphia region and beyond that have supported our work with their generous individual donations.



A BENEFIT CONCERT FOR THE
A.J. DREXEL AUTISM INSTITUTE

Thank you to our sponsors and attendees for making our first benefit concert a success!

We hope to see you at next year's concert on **October 13, 2018 at World Café Live.**

If you wish to discuss support for the A.J. Drexel Autism Institute, please contact:

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contact/giving-opportunities/](http://drexel.edu/autisminstitute/contact/giving-opportunities/)

GIVING OPPORTUNITIES



AUTISM INSTITUTE RESEARCH FUND

Gifts to the Research Fund will be used to fund pilot research projects that Institute investigators typically need to conduct before they can compete for federal or foundation grants. Preliminary results are often a required component of grant applications. This fund will also be used to support unanticipated research expenses that emerge during the course of completing studies.



PUBLIC HEALTH LECTURE SERIES

Our Public Health Lecture is an annual event that is open to the public. With support of this program, your gifts could help to strengthen and grow this series which serves as a cornerstone of our community outreach. This series could be enhanced by it occurring more than once a year, by attracting the most influential and engaging speakers, and by addressing topical issues which families and communities members are most affected by.



AUTISM EDUCATION AND OUTREACH FUND

Contributions to the Autism Education and Outreach Fund help to support the education of community members to aid them in their learning of ASD and ways to best guide those on spectrum. Learning centers, day cares, schools and community centers may not have the financial means to receive a formal training however with support of this fund, it will provide the means for those institutions in order to train their caregivers and families on best practices regarding ASD.



DREXEL AUTISM SUPPORT PROGRAM (DASP) SCHOLARSHIP AWARD

The Drexel Autism Support Program is a student-centered program for current Drexel students with the goal of promoting academic competency, self-advocacy, interpersonal skills, independent living and social integration. Gifts to this fund support deserving undergraduate students participating in DASP as they pursue their Drexel education.



TRANSITION PATHWAYS HUB

Our Transition Pathways Hub provides a physical structure for those participants of Transition Pathways to apply their learning in a real world scenario. This space is a home, a school, a meeting place and a location for social gatherings. Support of this Hub goes towards the necessities needed for the students and staff to be able to live and work in this space.



AUTISM INSTITUTE GIFT FUND

Support of the Autism Research Institute Gift Fund will be used for the Institute's unrestricted use or as needed per the Director.



DREXEL UNIVERSITY

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