

Transcript Fireside Charla 013: Autism Research at SDSU

Dr. De la Torre: Welcome today's Charla. Today we're going to talk about autism research at SDSU and we have two faculty who will be speaking to us today. But first of all, let me give you a little bit of a background about the autism spectrum.

Dr. De la Torre: About two in every hundred people worldwide have autism spectrum disorder. And due to an up picking in education, research, diagnoses have been increased by 15% in just two years. More resources than ever are dedicated to investigating autism and exploring ways to improve the lives of people with this disorder. SDSU is a hub of autism related research with more than 15 faculty affiliated with the University Center for Autism. Today my guests are two researchers who study autism from two different perspectives. Psychology professor Inna Fishman explores autism from the neural biological perspective and education Professor Jessica Surheinrich studies how we can create effective and supportive learning environments for children with autism. Dr. Fishman, let me start by asking a basic question, but one that is probably necessary given all the misconceptions often associated with this disorder. What is autism?

Dr. Fishman: Thank you. Thank you for that question. Autism or autism spectrum disorders are a broad range of brain based developmental conditions that are characterized by challenges that an individual may have with social skills, repetitive behaviors and social communication. And it's important to understand that autism is a developmental disorder because it starts early on in life with the first behavioral science today identified as early as the first or second year of life. As you said, autism affects about 2% of children in the United States. And by the way, very similar rates and numbers coming out from other countries and other continents. It's also important, I want to emphasize that autism affects all racial, ethnic, and socioeconomic groups equally. Although many times children and people from minority groups are not identified as readily because they have limited access to resources and services. The most important consensus among clinicians and researchers right now is that actually there is not one autism. But there are many autisms or there are many subtypes, as we will soon probably start calling them and they're influenced by a combination of genetic and non genetic factors that both contribute a small but significant amount of risk for somebody to develop autism. It is a spectrum disorder and what we mean by that is that each person with autism have a very different set of challenges and skills. The ways in which people with autism think or problem solve can vary from severely challenged to highly skilled. So one person with autism can live independently, and another requires a lot of support in school, at work, and with daily functioning.

Dr. De la Torre: The complexity and nuance is so important. I never imagined how important it was to fully understand this definition and the evolution of the definition over time. So another question I have Dr. Fishman is really in relationship to the research that you do on young

children with autism. So over time, obviously, there is an impact in brain development. What have you found in your work with reference to your specific research that follows young children?

Dr. Fishman: Currently, there are no brain markers or brain indicators that help physicians or pediatricians detect autism. So despite decades of research, we actually cannot name one brain feature that helps us either identify that the child has autism or predict what the prognosis of the child is. And it's actually very important to identify those markers early on, because as you know, early childhood is such a wonderful period of time. When children learn how to walk, they speak their first words, they start engaging with others. And it's the time during which the first symptom of autism can be detected. So it's actually very critical to identify what are the brain differences that early on in my research, we actually studied very young children as young as 15 to 18 months old when they first exhibit the first signs of autism, and we compare their behavior and their brain patterns to children who are typically developing.

Dr. Fishman: You may be curious about how we actually obtained brain images from such young children. Well, the magic of MRI allows us actually to peer inside somebody's brain. MRI is like MRI scanner is like a camera, but it uses powerful magnets and radio frequency waves to take pictures inside your body. For us, we take pictures of this child's brain. We do all of our MRI scans when toddlers are actually naturally peacefully asleep. During the regular bedtime. We don't use any injection or sedation, we just wait for them to fall asleep. Of course, I make it sound very easy. We actually collaborate very intensively with the child's parents or caregivers to develop a very specific individualized strategy for every child for the night for the scan night. We take into account their favorite lullaby, their bedtime, when they go to sleep, do they co sleep with their parents, what's their favorite blanket, and we try to recreate that environment in the MRI scanner. Now, this project is still ongoing, but I'm happy to share with you some of the first results that are emerging from the studying. What we're finding actually is that brain organization is already different by the age of two years by the time when their first symptoms of autism can be detected. Specifically, what we're seeing is that there are stronger connections between brain circuits that process incoming sensory information from different senses from visual, auditory and even sensory motor modalities. And what this means is that this unusually stronger connections, and I say and usually because we do not see them and children who are typically developing, so this unusually stronger connections mean that brains of very young children with autism process incoming information differently, and they perhaps mix information that is coming in from different senses. And this you can see how that can interfere with achievement of typical developmental milestones. And indeed, we see that the stronger disconnections, the more unusually stronger they are. The lower the scores of this little kids on a measures of language skills, social skills, and cognitive skills. We're actually currently collecting brain scans in the very same children as they grow and become entered to be three and five years old, because we want to see if this atypical connections normalize. Or maybe they're dependent on the child severity of their autism symptoms. Or perhaps they will go away because many of our children luckily very fortunately, are involved in early intensive behavioral

interventions, that the research shows that they work and have a very significant benefits for the child's outcome.

Dr. De la Torre: That's very exciting. Dr. Fishman, I just can't imagine how many parents would be so grateful to be able to intervene early on particular with behavioral interventions so that they can really ensure that our children can have the kind of developmental experiences and successes as their siblings and their peers. So that's wonderful. So now I'd like to turn to the center itself. Dr. Fishman, can you tell me a little bit about SDSU Center for Autism? I know you've been very, very involved as a leader in the center, and perhaps discuss a collaborations and particularly opportunities with the community with this important center for San Diego State and for the region.

Dr. Fishman: For the center, the San Diego State Center for Autism and developmental disorders, is actually a collaborative research center that unites many faculties from across different colleges and departments at SDSU who are devoted and focusing on increasing awareness and understanding of autism and developing and improving ways to detect, diagnose, treat, and ultimate cure autism and other disorders of development. Our center is really uniquely positioned here at SDSU to take advantage of so many wonderful experts from a very broad range of expertise. I'll give you examples of our center faculty members who come from such diverse disciplines is behavioral science, psychology, there are many types of psychology, clinical, school, and counseling psychology, developmental and cognitive neuroscience, brain imaging, education and special education, child development, you can see how the list goes on. And we're really lucky to have represented so many different fields whose experts really interact with children and adults on the spectrum with their families and with people who provide services to these families.

Dr. Fishman: I'll give you an example of research studies that this wonderful collaboration allows us to do. The sum of the specific projects that are unique to San Diego State that happened currently in the center include studies on improving quality and effectiveness of services that are being delivered in schools. Studies on how children learn words and how they use them. Brain imaging studies in autism across the entire lifespan. We have a study that examines how adults with autism fair, both cognitively and neurologically as they age which is very understudied area within autism, and so many others.

Dr. De la Torre: So thank you Dr. Fishman that that is exciting that we have this wonderful Center at San Diego State University that clearly is important for our students, our faculty, but more importantly, the community is getting direct benefits from this wonderful work that's been done by the team of faculty scientists and students. So now I'm going to turn to Dr. Suhrheinrich, and discuss her recent work in autism. So you recently receive doctors Suhrheinrich, a \$5.5 million grant that will help create better educational environments for autistic children. What are some of the challenges of educating students with autism?

Dr. Suhrheinrich: Well, thank you for having me first of all. And building on what Inna introduced as some of the clinical indications of autism. You can imagine some of the educational challenges. So, given the deficits that are often present in young children with autism, including communication challenges, repetitive behavior, social difficulties, the regular school environment can present a lot of difficulty. And it can be quite challenging for children with autism to access the regular educational opportunities that would be present in our public schooling system. So these could be attentional, these could be with regard to social engagement, building peer relationships, building relationships with teachers. Also, understanding cognitively what's being presented on a daily basis in a classroom. So many students with autism receive education services with individualized education plans or an IEP, which specifies specific educational goals that are tailored directly to that student. So the work that we're doing as part of this new initiative is aimed at building capacity across the state of California to increase the use of evidence based practices or research supported practices that are known to have the best outcomes for children with autism.

Dr. De la Torre: So Dr. Suhrheinrich, I'm just curious how you engaging teachers in the schools, because I know many faculty across the country aren't really familiar with even what autism is, how to engage with appropriate pedagogies in the classroom, how to ensure student success for these important members of our community. So what are you doing in that area?

Dr. Suhrheinrich: Oh, that's a great question. Many teachers feel overwhelmed by some of the challenges that educating students with autism present, especially teachers who were brought up through our general education training programs, so not necessarily special education services. But as the technology as the research has developed, the technology supporting education of individuals with autism has also developed. So there are many teachers in practice who feel ill equipped to support and educate our young children with autism. This often leads to an interest in receiving some additional training. But another motivator comes probably from a higher level, and that has to do with outcomes that are indicated from state level reports. So unfortunately, the outcomes for students with autism are quite poor in comparison to typically developing children and those who receive services under other disability categories. This is across a range of outcomes that are measured statewide including reading scores, math scores, graduation rates. And these are all problem areas and areas of focus for education administrators.

Dr. De la Torre: So how does your research address the challenges of developing the types of interventions that are critical for the success for students with autism in the classroom?

Dr. Suhrheinrich: One important piece about providing services for autism is making sure that they're suitable for the educational environment in which these students are served. So we are focused on educational services that build on evidence based practice, but also are feasible are sustainable within public school systems, and are appealing to teachers and other staff who support these students. So it's important that they work within standard classroom environments. So if a teacher is using a group setting, working primarily in small groups or in

large groups, the educational interventions we provide, and that are generated by educational researchers, need to fit within that environment. Additionally, they should build on what works effectively with students. So targeting not only student motivation and interest but also incorporating educational goals as are specified in the educational programs, individualized educational plans, is important for really seeing positive outcomes for students with autism.

Dr. De la Torre: Do you see in the field of education, a move towards incorporating students with autism in regular classrooms and not using special education as a focal point to aggregate these students? Is there a change in the culture? Do you see that change or is it a realistic approach? Or is there again looking at the spectrum of students still in need for the special education classroom for the students?

Dr Suhrheinrich: Well, as Inna mentioned, individuals with autism will present present with a wide range of functioning levels across the lifespan and certainly in public education. However, our education law requires that every student, not just students with autism, but with any disability, and at all ages are in the least restrictive educational environment to meet their needs. And so our students with autism need to be educated in the environment that can maximize their learning, while still providing the most access to a general education setting. So yes, this is important and that and that's certainly an area where we are trying to improve services. There's a move toward inclusion full inclusion, which means students with autism or with disabilities are included in educational programs with general education peers. Special education services are really designed to be a support to give access to the grade level curriculum for all students.

Dr. De la Torre: So moving right along with your response it's clear that these changes need to occur with increased success in the classroom for these students. So what are the strategies that you see are important so that teachers are fully prepared, but also, schools are fully prepared to embrace an inclusive environment for these students as well as to ensure successful outcomes so that they can, as you mentioned earlier, be more successful in school.

Dr Suhrheinrich: Well, this gets right to my passion, which is improving the quality of professional development that we provide to educators both pre service so those who are in our credential programs here at San Diego State and elsewhere. And then also those who are in service who are already teaching, as the technology for supporting students with autism has improved, so has the need for continued training and professional development that really draws on what we know about adult learning, effective adult learning. For too long, our expectations around professional development with teachers have been antiquated. And often professional development looks like a one stop one day workshop where teachers or other providers receive information and they may increase their knowledge of a specific type of intervention, but not their ability to really integrate those strategies into the classroom program and to enhance the quality of services that students receive. So we are working hard to change the landscape of professional development for teachers to emphasize coaching feedback from supervisors, technical assistance, substantial resources to support students in the way that they

need to be supported. And an environment that really supports teachers in implementation and effective sustainment of these practices. So you're right, it starts with the teacher, but really encompasses the whole educational environment, leadership within education and special education services is important. And that is what this new work that we're embarking on, really targets in partnership with the California Autism Professional Training and Information Network with the acronym CAPTAIN. We are able to use a train the trainer model to build local expertise within regions across the state to support districts to transform their special education, programming and enhance the quality of services for students with autism.

Dr. De la Torre: Well, that's a real exciting opportunity. And it sounds like a real shift in organizational culture as well. So I think it's great to hear the types of projects that are really going to make a difference in the lives of students with autism. But now I want to switch to a more general question. And that is, what are some of the misconceptions or myths that you would like our listeners to know about? So I want to first turn to Dr. Fishman.

Dr. Fishman: This is a very important question. I'm glad you asked that. We get asked a lot of this and I maybe I'll highlight a couple that are really close to my heart. One of the most common questions asked after a family receives a new diagnosis of autism. Gosh, what caused this? I mean, why us why my child has autism? What we know is that is that there is not one cause of autism. There is no one underlying commonality that all people with autism will have. In fact, research suggests that autism develops from a combination of genetic and non genetic influences. But it's also important to understand that this influence is just slightly so increase the risk that the child will develop autism. This inferences appear to increase the risk that a child will develop autism. But it's important that not to confuse an increased risk with cause. For example, some genetic markers associated with autism can be found in people who don't have autism. Similarly, not everybody who is exposed to certain non genetic risk factors that are known to be associated with autism will develop the disorder. In fact, most will not. So what I want to emphasize is that, unfortunately, we don't know what causes autism yet, which is only one more reason to continue with the research that I and my colleagues are doing. I probably want to also touch on another very common myth. And you can guess what I'm going to talk about. About early childhood vaccinations and autism. This is a difficult issue because every family has a very unique experience with an autism diagnosis. And some of the families received that diagnosis during the time that their child was exposed to vaccinations, but I want to emphasize the coincidence of this two events. And largely we understand it to be because early childhood is the time when autism symptoms first emerge. And for those of you who are parents will remember that during that time, they're very frequent physicians pediatrician office visits. And so it may happen that during that the first signs of autism just overlap or corresponded to the timing that that family received their child's vaccinations. Scientists have looked into thousands and thousands of children, those who receive vaccinations, those who didn't and those who receive them on a slower or different schedule. And the answer is very clear, the results are very clear. There is no link, affirmatively no any link between receiving vaccinations and developing autism.

Dr. De la Torre: Well, I think that's an important message to share. Because again, using evidence to understand autism and using evidence based approaches are critical if you really want to tackle this particular issue head on. So now I want to turn to you, Dr. Suhrheinrich, what are the issues and misconceptions or myths that you really want to share with our listeners today and that you feel they need to know about moving forward?

Dr. Suhrheinrich: Well, one area that certainly affects services and high quality services relates to the heterogeneity and autism. So you may have a stereotype or one might have a stereotype about what they think autism looks like in a child or an adult. But there's actually considerable variability in both how severe symptoms are or how severe delays are, and also the presentation of specific skills or aptitudes. So in thinking about how to best prepare educators to serve students with autism, we actually have to think of the wide range of skills that would be needed to address kids who come into the classroom year to year with a variety of different challenges, strengths, interests, to equip teachers to be able to serve them one year after the next.

Dr. De la Torre: Well, I want to tell you that I think the listeners today are going to be incredibly impressed by your comments and your insights about autism and the research that we do here at San Diego State. It's clear that our students and our community and actually the future of understanding this important disease will be affected by continued investment, both in terms of the federal government and the state in supporting both the basic research as well as the interventions that are teachers so desperately need as well as our families so that they can support their children and their families in addressing autism in their families. So I want to thank you today. It's been a wonderful opportunity to have a discussion on the great work that we're doing here at San Diego State University. Thank you again.

Dr. Suhrheinrich: Thank you.

Dr. Fishman: Thank you for having us.