(1) NPR's All Things Considered:

# Autism Gives Woman An 'Alien View' Of Social Brains

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Lisa Daxer is a biomedical engineering major at Wright State University in Dayton, Ohio. She says her autism has made her feel like an outsider but has also helped her become something of an expert on the social behavior of people she calls "neurotypicals."

(2) It takes a smart brain to invent a spaceship. But putting one in orbit takes a brain with extraordinary social skills.

That's because getting from concept to launchpad takes more than technology – it takes thousands of people agreeing on a common goal and working together to accomplish it.

(3) Humans have succeeded in part because we evolved a brain with a remarkable capacity for this type of complex social interaction. We automatically respond to social cues and facial expressions. We can look at the world from another person's point of view. We are predisposed to cooperate.

(4) But all these things are so much a part of us, they're easy to take for granted.

Unless you have autism, like Lisa Daxer.

Daxer, 27, is a biomedical engineering major at Wright State University in Dayton, Ohio. And for her, things like reading faces and understanding what's on another person's mind are a struggle.

(5) When Daxer was in elementary school, it became clear that although she was better than her classmates at reading and math, they were better at social interactions. "I realized that they had friends and I didn't," Daxer says.

Lisa Daxer says she doesn't want a typical brain and that her autism is part of who she is. But she says she will probably always feel like a bit of an "alien."

(6) Autism has made Daxer feel like an outsider, even an alien. "I have a weird brain," she says.

But it's also helped her become something of an expert on the social behavior of people she calls "neurotypical."

Daxer records her observations about neurotypicals in a blog called Reports From a Resident Alien. (http://chaoticidealism.livejournal.com/)

(7) People like Daxer have taught scientists a lot about how typical humans interact socially, says Simon Baron-Cohen, a professor of developmental psychopathology at the University of Cambridge in the U.K.

"We didn't really focus on how complex social development is until people with autism pointed out to us that this is something that doesn't always just develop naturally," Baron-Cohen says.

(8) Most children quickly figure out the importance of making eye contact, how to read facial expressions and social cues, and how to fit into a group.

## The Social Behavior Of 'Neurotypicals'

But Daxer says these things are still very difficult for her. So she has become something of an amateur anthropologist, studying the social behavior of the people around her, the people she calls neurotypicals.

(9) One of the first things she noticed on campus was that students tend to "clump."

"By default, they socialize," she says. That's true whether they're in a coffee shop, a library or even the anatomy lab, where Daxer once watched a group of young women gossiping as they dissected human hearts.

"You have to actually interfere to stop neurotypicals from socializing," she says.

(10) This compulsion to socialize is no accident, Baron-Cohen says. "Amongst primates, particularly social primates, it is important to stay within the group," he says. "If we took an evolutionary perspective, that would be for physical survival. A member who becomes separated from the group is at increased risk of predators, to put it bluntly."

(11) So the humans who survived were predisposed to have what you might call a "social brain."

It's still with us. Think fraternities, or Facebook.

And if you want to be part of a group, you must constantly monitor your status with other members, Baron-Cohen says.

(12) "You're picking up cues about what they might find acceptable or interesting, or unacceptable," he says. "Picking up those cues very early could mean the difference between inclusion and exclusion. If you've done something that might offend somebody or upset somebody, it's good to notice that quickly, so you can fix it."

Before they defriend you.

**(13) Taboo Topics**

Belonging to a group also means following unwritten rules, like not violating taboos. Our social brains are really good at learning these rules — it doesn't take long for most kids realize that you don't just blurt out that someone is fat or old or stupid.

(14) To Daxer's brain, though, observations like these are just facts. So she had to memorize a list of topics that seemed to offend neurotypicals: "Don't talk about sex. Don't talk about the anatomy lab. Don't talk about surgery. Don't talk about anything that happens in the bathroom."

(15) And that list is far from done. Daxer recently figured out that death is off-limits too.

"I hadn't realized that and had been talking about it to my friends until someone, actually the church librarian, mentioned to me that she thought it was a depressing topic to talk about," she says.

(16) Daxer still doesn't really get taboos. She suggests that perhaps these subjects just irritate neurotypicals, the way certain sounds or textures can irritate people with autism.

We all avoid different things. I avoid polyester clothing. They avoid talking about death.

(17) "We all avoid different things," she says. "I avoid polyester clothing. They avoid talking about death."

But there's more to it than that.

Taboos are just one of the vast number of social rules that most of us don't even know we know: Don't stand too close. Don't stare. Take turns.

But this is just the beginning of what our social brains learn to do.

(18) Daxer realized this when she was living in a group house with other students, who used to get together to watch the TV show Friends.

"I think it's a silly show, a very neurotypical show actually," Daxer says. "It's all about relationships. I would watch their faces as they watched the show. They were

mirroring the people on the screen, I think."

(19) Her housemates were unconsciously mimicking the smiles, frowns and even some of the gestures of the people onscreen. That was a revelation, Daxer says, because it's something she doesn't do.

But it's something most children start doing before age 2, Baron-Cohen says.

(20) "They're looking up at people's faces. They're paying attention to people's facial expressions and they're responding," he says. "So if someone looks sad, they will mirror the expression."

This sort of mirroring is probably the basis for one of the most complex and important social skills: empathy.

**(21) Learning About Empathy**

The typical human brain has evolved an extraordinary ability to see the world from another person's point of view and to feel what that person is feeling.

That helped our ancestors get along. It's also one of the reasons that humans, and some other species, care for a member of their group who is injured or sick.

(22) Daxer learned a lot about empathy from one of her housemates, a young woman she calls "superneurotypical" because she had such good social skills.

At the time, Daxer was feeling increasingly depressed and isolated. This woman seemed to understand. "I think she knew that I was hurting and she didn't want me to hurt anymore," Daxer says.

(23) But her depression got worse. Eventually, Daxer ended up in the hospital.

"She visited me in the mental ward," Daxer says. "In our society, being crazy is considered very, very frightening. You think of TV slasher killers. And this girl, when I had depression, she visited me in the mental ward. That takes courage; that takes friendship; that takes empathy."

(24) Empathy may have evolved from the relationship between parent and child, says Baron-Cohen.

"If the parent has empathy, they're going to be able to imagine that the infant might be in pain, or discomfort, or hungry or tired, or in need of affection, a whole range of mental states," he says. "So empathy would have promoted better parenting."

And the genes involved in empathy would get passed on to the next generation.

**(25) Another Key To Human Success**

But empathy isn't just about raising children and caring for the sick. If you can look at the world from another person's point of view, it's much easier to take on common goals. You can cooperate, which is one of the keys to human success.

Daxer remembers seeing a remarkable example of cooperation one day at church.

(26) The pastor asked for help turning the fellowship hall into a dining hall, she says. "And they had that fellowship hall turned from a place with a couple of hundred chairs to a place with a couple dozen tables and tablecloths and place settings and everything in about 15 minutes flat."

(27) Dozens of people worked together with hardly a word, Daxer says. All it took was a few glances, some body language and a common purpose, she says.

"You don't see very much of that in other species," Baron-Cohen says. He says humans seem wired to understand that two people can move a log that's much too heavy for one person to carry. "And that's obviously enabled humans to do all kinds of

things," he says, "like put up buildings."

Or send spaceships into orbit.

**(28) An Evolutionary Explanation For Autism**

Daxer says she sometimes wonders why, from an evolutionary perspective, people with autism are still around.

And she's come with one possible scenario, involving a caveman named Bob.

"So let's say Caveman Bob invents fire," Daxer says. "But because he's autistic he's too nerdy for the cavewomen, so he doesn't have any children. I mean how is that an advantage when it comes to natural selection?"

(29) It seems like it wouldn't be. But if Bob's discovery gives his tribe an advantage, Daxer says, his relatives will be able to have more children even if he never has any. So Bob's genes, including those involved in autism, will be passed on to future generations.

That's a plausible explanation, Baron-Cohen says.

(30) "As tool users we always needed individuals in the group who could invent new tools," he says, "whether we're talking about in the Stone Age – just flints – or in the modern age, new computer chips."

Of course that still doesn't account for autism that is completely disabling, Baron-Cohen says.

**(31) Adapting With Autism**

Daxer says she doesn't want a typical brain. Her autism is part of who she is. She enjoys that her brain loves patterns and facts.

And she will probably always feel like a bit of an alien, she says.

“I wonder what it is like to be part of a unit of two,” she muses. “I don’t know. But then again, they’ll never know some of the beautiful things I see – the tiny little patterns on a leaf, or the intricacies of a circuit. Or learning a new fact and almost squealing for joy because it’s so beautiful.”

(32) The gap between Lisa and the neurotypical world will never disappear. People still treat her as different. But Daxer has done a remarkable job of adapting. She has made friends and found colleagues who value her scientific work. And Lisa says she has come to appreciate the power of what neurotypicals can do with their social brains.

(33) "I've seen them help people who are hurt," Daxer says. "I've seen them draw together networks of people to make the world better. I've seen them connect different sorts of minds so that we could all communicate and live in a single society. I know you take it for granted, but it's really very amazing to be able to do that."