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New Tools Detect Autism Disorders Earlier in Lives

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When a child is diagnosed with an autistic-spectrum disorder, a parent's emotions can swing from disbelief to worry to despair, and many ask themselves the understandable question: Why did this happen?

Genes are the answer, though which combinations are responsible remains a mystery.

PHOTO: TOMASZ WALENTA

The mounting evidence for a heritable cause hasn't stopped some people from trying to pin the disorder on parents, fueling parental guilt and damaging families that are already struggling with a child's diagnosis. Now a new study shows that the roots of autistic disorders are detectable so early in life that, other than genes, any parental contribution to the disorder is probably nil.

ASIDE FROM GENETICS, ANY PARENTAL CONTRIBUTION TO THE DISORDERS IS PROBABLY NIL

There is a long and bitter history of baseless finger-pointing around autism. In one of 20th-century psychology's most shameful mistakes, supposed experts blamed the childhood disorder on "refrigerator mothers," who were said to cause autism by being emotionally distant. Ultimately, studies showed that a crucial clue to the disorder's origin was the babies' inability to respond to their mother's nurturing—not the other way around. Fifty years later, activists tied autism to childhood vaccines. This false idea led to fewer immunized children and a resurgence of dangerous infectious childhood diseases.

In this new study, John Lewis, the lead author and a neuroscientist at the Montreal Neurological Institute, analyzed data from the MRIs of 260 babies to chart the trajectory of their developing brains. (It was published this summer in Biological Psychiatry.) His previous work had revealed that toddlers with a strong family history of autistic spectrum disorders show sluggish neural pathways in areas critical to language and social development. Such pathways, composed of nerve fibers, transmit information from the body's five senses and allow regions of the brain to communicate with each other. Dr. Lewis wanted to see how early these neural inefficiencies appeared.

Using MRI-based data, Dr. Lewis and his team charted—at six months of age and again at 12 months—the length and strength of fibers connecting different regions of the babies' brains. Shorter and stronger connections are more efficient.

As children grow, their brains typically streamline such connections by "pruning"—a form of neural housekeeping whereby unnecessary or unused connections between distant brain regions are weeded out.

His research team the tracked neural pathways of two groups of infants. One group had a sibling on the autistic spectrum—which meant the baby was at high risk of developing the disorder. The control group had no family history of autistic spectrum disorders.

A comparison of the two groups revealed that, when analyzed as a group, the brains of 6-month-olds with an autistic sibling showed inefficiencies in the right auditory cortex, an area that processes speech sounds. By 12 months of age, certain neural areas critical for language, touch and self-awareness were also less efficient than those of the control group. "If your brain starts off not processing the sensory inputs efficiently, then it can't do the proper pruning. It's just passing on noise," said Dr. Lewis.

The study was launched seven years ago, and by the time it was complete, the researchers knew which of the high-risk infants ended up with an autism spectrum diagnosis. (Almost 17% of the high-risk group received an autism diagnosis, compared with 1.3% of the control group.) Yet they found that the biological markers of their disorder were evident at 6 months of age.

A computer analysis of the high-risk group's MRIs could retroactively identify which babies would ultimately show behavioral signs of autism spectrum diagnosis years later—and which babies would be unaffected. What's more, the degree of neural inefficiency predicted how severe that child's symptoms would be.

This research suggests that very early diagnosis—and early intervention—is on our doorstep. It also means that parents can't be blamed.