

Will study of healthy brain shed light on autism? Researchers hope so

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A discovery about how the brain matures in healthy children could help researchers learn more about what goes wrong in disorders like autism.

A team of American and Canadian scientists has found that some regions of the brain mature in sync with each other, and that these tend to be areas involved in higher cognitive functions, such as interpreting information, reasoning and problem solving.

“The obvious question is does this differ if you have autism? Does this differ if you have attention deficit hyperactivity disorder?” asks Jason Lerch, a scientist at Toronto’s Hospital for Sick Children, part of the team that published the study in the journal *Neuron*.

The team tracked the brain development of 108 children, doing brain scans of each participant at least three times over 13 years. The volunteers were 9 or younger when they started in the study, the largest of its kind, run by the National Institutes of Health (NIH) in the United States.

There are many individual differences in brain development, but the size of the study allowed the scientists to see an overall pattern, says the lead author of the study, the NIH’s Armin Raznahan. The researchers looked at development in the cerebral cortex, the important outer layer of the brain involved in memory, attention, consciousness, as well as controlling movement and processing information brought in by the senses.

In general, the cortex gets thinner during late childhood and adolescence, probably because the brain prunes unused connections.

“Initially the brain starts out with lots of connections between different areas. As they are being used and refined, you lose the ones that aren’t being used,” says Dr. Lerch.

The researchers discovered that some areas get thinner at the same time. These regions aren’t next-door neighbours, but they work together, which may be why they mature together.

Studies are under way that will allow researchers to see if this pattern of development is different in children with autism, a brain disorder that affects communication and social interaction.

“Understanding the normal maturation of the brain opens the possibility that we can understand the maturation differences in kids with autism,” says Evdokia Anagnostou, a child neurologist and researcher at Bloorview Research Institute. She is involved in a brain-imaging study of children with autism recently launched in Toronto and Montreal. It could shed light on how early differences shape brain development and the best windows for interventions.

Tomas Paus at Baycrest’s Rotman Research Institute, an expert in the adolescent brain, says it is important to understand what drives synchronicity in brain development. Is it genes? Or the environment? Or a combination of the two? How important is it for healthy brain development?

“It may be that, for whatever reason, the brains of people with autism are not operating in this nicely co-ordinated way – leading, in turn, to a lower degree of their structural likeness,” says Dr. Paus.