

TAKING AUTISM AT FACE VALUE

Can examining the face provide insight into autism? Perhaps. A consortium of researchers from Canada and the UK are using sophisticated technology to create and analyze detailed 3-D maps of faces of those with and without autism.

The facial analysis, led by Professor Peter Hammond of the UCL Institute of Child Health in London, offers clues into when the physical processes that lead to autism develop and how the condition might be identified early on. "Because we are interested in heritable genetic factors contributing to autism, we studied families in which several family members had an Autism Spectrum Disorder (ASD)," says Cynthia Forster-Gibson, a collaborator in the research from Queen's University. "In these families, we expect that some family members will have a genetic predisposition that increases their likelihood of having an ASD."

MORPHOMETRIC ANALYSIS OF THE FACE SHOWS SUBTLE CHANGES IN ASD

The researchers used a special camera to capture 3-D images of the face and a technique called dense surface modelling to compare the face shape of 72 boys with ASD, 128 of their first-degree relatives and 254 unrelated individuals who had not been diagnosed with ASD. "In the boys with autism, we found that there was a very subtle right dominant facial asymmetry, most apparent above the eye and in front of the frontal pole of the underlying brain," says Forster-Gibson. "This was not visible to the naked eye. We think the asymmetric growth of the face could occur in response to the asymmetric growth of the brain underneath, or that the asymmetric growth could occur in parallel. Either situation would be influenced by genetic factors."

Martha Herbert, an expert in morphometric analysis from Harvard Medical School and Massachusetts General Hospital in Boston, was impressed with this study and the technology involved. She and her team have demonstrated differences in the volume of various parts of

the brain among individuals with and without ASD as well as with developmental language disorders. The current research builds on their findings.

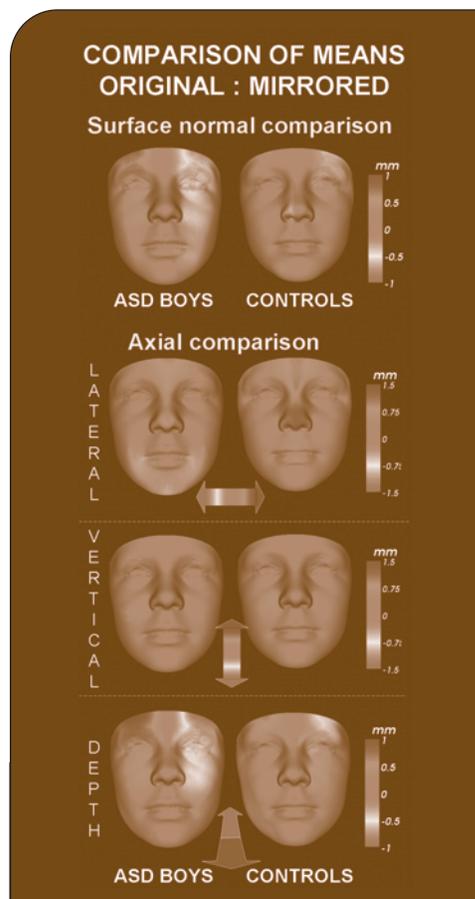
INSIGHT INTO WHEN TROUBLE STARTS

Forster-Gibson and colleagues conclude that, since facial development occurs during development of the embryo and fetus, their research suggests that the underlying causes of ASD may also occur in that stage. Herbert goes even further. "The literature in autism is showing increases in brain volume that occur rapidly in the first two years after birth, and there does seem to be some relationship between brain volume and the size of the face," she says. So, abnormal brain growth even after birth may also be producing some of the subtle changes picked up by Forster-Gibson's team. In other words, the physiologic mechanisms associated with the development of ASD may occur during fetal development, soon after birth, or both. Teasing this out is important because once it is possible to pinpoint when the problems start to occur, it may be possible to develop interventions that prevent problems from emerging.

POTENTIAL FOR EARLY DIAGNOSIS

Another exciting implication of these findings is that, with further research, facial scanning could contribute to early diagnosis of autism. "Because we know that many children with ASD benefit from early therapy, we would like to find a way to help to identify children at risk of ASD at the earliest age possible." That is not yet possible with current technology, however. 🦋

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