

## **FACIAL PHENOTYPIC DIFFERENCES IN CHILDREN WITH AUTISM SPECTRUM DISORDERS**

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The brain develops in concert and in coordination with the developing facial tissues, with each influencing the development of the other. Autism spectrum disorders (ASD) result from alterations in the embryological brain, suggesting that the development of the face of children with ASD may show subtle facial differences compared to typically-developing children. We test this hypothesis by comparing three-dimensional photographic images acquired from children with ASD and age-matched, typically-developing children

The 3dMD Cranial system was used to acquire 3D stereophotogrammetric images for our study sample of 8-12 year old children diagnosed with ASD (N=60) and typically-developing children (N=69) following approved IRB protocols. Three-dimensional coordinates were recorded for 17 facial anthropometric landmarks from these images using 3dMD software. Age-matched comparisons of facial morphology in the two groups were completed using Euclidean Distance Matrix Analysis (EDMA).

Results show that there are significant differences in facial morphology in children with ASD compared to typically-developing children. Children with ASD have significantly broader orbits, philtrums, and mouths, and higher foreheads relative to typically-developing children. Typically-developing children display more anteriorly prominent foreheads and nasal bridges relative to children with ASD. We also find a subgroup of children with ASD with facial morphology that differs from the majority of the children with ASD and the typically-developing children; this subgroup is defined by a superoinferiorly longer midface. These results indicate that alterations in the developing brain may be associated with subtle, but distinct differences in facial phenotypes.

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