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A 3D GEOMETRIC MORPHOMETRIC INVESTIGATION OF SEXUAL DIMORPHISM IN JUVENILE HUMAN CRANIA DURING ONTOGENY

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Abstract

Although there is a coherent body of literature and consensus on the morphological presentation of sexual dimorphism in the adult human skeleton, there is still debate about the ontogenetic origins and proper methodology for assessing sexual dimorphism in juvenile humans, making sex estimation from subadult skeletal remains tenuous at best.

Using Enlow's mammalian craniofacial architectural relationships, Bromage (1992) demonstrated that there are statistically significant morphological differences in female and male juvenile chimpanzees. In this study, Bromage's methodology is expanded to collect 3D data from *in vitro* human juvenile CBCT scans and analyzed using geometric morphometrics in order to investigate craniofacial sexual dimorphism during ontogeny.

A sample of Cone-beam CT scans derived from Australians 6-13 years of age were analyzed (*n*=50 males and *n*=48 females). 3D landmarks for 46 craniofacial architectural points were independently identified by two observers using Analyze 11.0 software. Points that could not be agreed upon within 1.6 mm—or 4 voxels on the 0.4 mm/voxel image—were discarded from analysis.

Principal components analysis, discriminant function analysis and regressions revealed that the craniofacial architecture of male and female juvenile humans in this sample is very similar; however, there are appreciable trends in variation between the sexes and in different age groups that warrant further examination.