



Anthropology Section - 2016

A110 Examining Four Potential Proxies for Standard Craniometrics: A Statistical Analysis for Significance and Demographic Correlations

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After attending this presentation, attendees will recognize the potential for the development of proxy measurements for standard craniometrics and the need for novel craniometrics. This study presents an evaluation of proxy measurements for Upper Facial Breadth (UFB) and a novel measurement for interorbital distance.

This presentation impacts the forensic science community by providing an alternative method for ascertaining UFB in fragmented remains and presents a potential new cranial measurement. Both of these measurements contribute to the identification of sex and ancestry of human skeletal remains in forensic cases.

Following the contemporary trend in the discipline of forensic anthropology to re-evaluate standard craniometrics and add statistical rigor to the assessment of sex and ancestry, this preliminary research tests three potential proxy measurements for UFB and one potential proxy measurement for interorbital breadth. These proxies would be used for fragmentary remains in which the pristine standard craniometrics are unobtainable.

The three UFB proxies are based on a unilateral measurement from nasion to Frontomalar temporalis (FMT) multiplied by two; one is measured in the same plane ("Planar"), one is measured across the plane ("Cross-planar"), and the last is measured with an instrument ("Apparatus") created for this study. The proxy for interorbital breadth was the measurement of distance between the orbits at the height of nasion, as opposed to the standard dacryon-to-dacryon measurement. These measurements were then compared to their standard measurements. Standard craniometrics and the four proxy measurements were collected on 30 individuals, most with known demographics.

Fluctuating asymmetry was assessed and found not to be a factor in the study population. The proxies were then tested for significant difference from their standard counterparts. All measurements were found to be significantly different from the standard, except the "Planar" measurement. The "Planar" proxy and UFB were assessed by discriminant function analysis for their ability to discriminate between the sexes and between the ancestral groups "White," "Black," and "Native American" in both Statistical Package for the Social Sciences (SPSS) and FORDISC®. Analysis shows that "Planar" was as effective as UFB in discriminating sex and ancestry. Based on these results, it appears that the "Planar" measurement is an effective proxy for UFB. Additional testing is needed to further bolster these results.

Testing found the measurement of interorbital breadth at the height of nasion was significantly different than the standard interorbital breadth measurement. Preliminary testing indicates that this novel measurement may, nonetheless, be useful in the assessment of sex and ancestry much like the standard interorbital measurement, but further testing of this finding is needed.

Proxy, Sex, Ancestry