



A120 Results of Testing Interobserver/Intraobserver Error for “Planar” Proxy for Upper Facial Breadth and Novel Measurement of Interorbital Distance

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After attending this presentation, attendees will better understand the potential benefit of a proxy measurement for upper facial breadth and interorbital distance for analysis of fragmented remains. This study presents the analysis of data collected at the 2016 American Academy of Forensic Sciences (AAFS) Annual Scientific Meeting in Las Vegas, NV, to test for interobserver and intraobserver error in these measurements.

This presentation will impact the forensic science community by testing the accuracy and consistency of alternative methods for collecting cranial measurements. Cranial remains, specifically the facial component, are often fragmented due to the fragile nature of this area. This limits the collections of standard craniometrics, which are used to develop a biological profile necessary for the identification of skeletal remains. This could be rectified by the use of proxy measurements and the development of novel measurements to obtain the necessary information to make an identification. If found accurate and reproducible, these measurements would contribute to the resources and methods available for analyzing fragmented cranial remains when the standard points of reference are damaged. Previous research demonstrated that these measurements can aid in the identification of sex and ancestry of human skeletal remains.¹

This study is a continuation of the trend in the discipline of forensic anthropology to re-evaluate standard craniometrics and add statistical rigor to the assessment of sex and ancestry. The previous study presented three Upper Facial Breadth (UFB) proxies and one alternative measurement for interorbital breadth.² This research examined the “planar” UFB proxy and a new measurement, interorbital breadth at nasion, for interobserver and intraobserver error. These measurements are being tested for their utility on fragmentary remains in which the pristine standard craniometrics are unobtainable.

Cheramie and Kles found that “Planar” (a unilateral measurement from nasion to Frontomalar temporalis (FMT) measured in the same plane and multiplied by two) was not significantly different than UFB and produced the same results as UFB in discriminating sex and ancestry, suggesting it could be an effective proxy for UFB in damaged remains.² Testing also found the measurement of interorbital breadth at the height of nasion was significantly different than the standard interorbital breadth measurement taken at the height of dacryon, but it was also found to be useful in the assessment of sex and ancestry, suggesting it could be used instead of the standard measurement in damaged remains.

During the 2016 AAFS Annual Scientific Meeting, volunteers were solicited to measure crania to assess interobserver and intraobserver error. Participants were asked to measure one of three crania with spreading and sliding calipers. They collected nine standard measurements, the Planar proxy for UFB, and the new interorbital distance at nasion measurement. Participants were asked to conduct the measurements twice and were asked a series of questions about their level of education and experience. Fifty-two individuals participated.

Results were inconclusive. The “Planar” measurement was found to be statistically different ($p < 0.05$) in two of the three specimens. No significant difference ($p < 0.05$) was found in interorbital breadth at nasion in two of the three specimens. Although the results were mixed, the findings suggest that these measurements have promise. Future testing will include examining the descriptions of the measurements for clarification, re-testing on larger samples, and collecting data on known samples to test the utility of interorbital distance at nasion.

Reference(s):

1. Cheramie, Jacob. Examining Four Potential Proxies for Standard Craniometrics: A Statistical Analysis for Significance and Demographic Correlations. Undergraduate honors thesis, University of Louisiana at Lafayette, 2015.
2. Cheramie, Jacob and Kles, Maranda. Examining Four Potential Proxies for Standard Craniometrics: A Statistical Analysis for Significance and Demographic Correlations *Proceedings of the American Academy of Forensic Sciences*, 68th Annual Scientific Meeting, Las Vegas, NV, 2016.

Craniometrics, Upper Facial Breadth, Interorbital Distance