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**TESTING THE ACCURACY OF THE MORPHOPASSE PROGRAM ON 3D VIRTUAL
PELVES DERIVED FROM MEDICAL COMPUTED TOMOGRAPHY (CT) SCANS**

Ashley Espinoza

Abstract

In forensic anthropology, the biological profile is composed of estimations of an unknown individual's sex, age, ancestry, and height for the purpose of narrowing potential leads for law enforcement. The methods used to produce these estimations need to be in accordance with the Daubert standard by producing accurate, reliable, and replicable outcomes, to be valid within a medico-legal setting. Sex is usually the first estimation made and is used as a foundation for producing age, ancestry, and height estimations since these methods are often sex-specific. These sex estimation methods must be tested to account for secular change within a population and if appropriate to use for other populations. As the field of biological anthropology strives to improve and innovate the methods used to estimate biological profile, we have also begun to incorporate new technology in the form of advanced statistical algorithms and bio-medical imaging. These advances provide a wider range of opportunity in terms of research availability and modern demographics. The purpose of this study is to test the accuracy of the MorphoPASSE software from 3D models derived from medical CT scans (300 individuals = 150 males, 150 females) and to analyze the expression of pelvic morphology within a modern population. A small sample of 40 individuals (20 males, 20 females) was used to calculate the intra-observer rate and received a Kappa value of 0.85. Both the intra-observer sample (40) and the main sample (300) received a high accuracy rate of assessing sex, at 92.5% and 93.3%, respectively. A chi-square test also found no statistically significant difference between the misclassification of each sex. Therefore, the MorphoPASSE software does provide a high accuracy rate in estimating sex from 3D models derived from CT scans. The sample also demonstrates the trend observed by Klales' (Journal of Forensic Sciences, 61, 2016 and 295) females express more gracile pelvic traits in modern populations than historical populations. This trend could be a result of secular change, environmental pressures, and/or genetic drift but must be furthered studied to provide to better understand these morphological changes.