A28 The Optimized Summed Scored Attributes Method for the Classification of American Blacks and Whites: A Validation Study

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After attending this presentation, attendees will understand the reliability of the Optimized Summed Score Attributes (OSSA) method created by Hefner and Ousley, which is currently employed in biological profile ancestry estimation for unknown individuals in active forensic cases.[1]

This presentation will impact the forensic science community by proposing a new sectioning point that maximizes classification accuracy, thus demonstrating the utility of OSSA for modern forensic casework.

Ancestry estimation is essential for assessing the potential identity of unknown persons and is one of the most difficult parameters of the biological profile (age, sex, stature, ancestry) to estimate. Non-metric traits have been pervasive in their use within the field of forensic anthropology and are continually used in active cases and in research.[2] Recent work examining the "gestalt" approach to ancestry estimation shows that decisions by researchers concerning the population affinity of an individual may be established within seconds upon first viewing the crania.[3] Thus, initial impressions, based upon past experiences, bias the researcher either consciously or subconsciously. The aforementioned impressions are generally the product of typological approach-based training and education, which have been ubiquitously taught in the foundation of forensic anthropology and are still included in many introductory forensic anthropology texts. As a means to standardize this typological approach, Hefner consolidated the various typological character lists used in forensic anthropology to 11 traits, either binary or expanded into ordinal character states, to more adequately capture the range of normal human variation observed and to avoid the inherently biased typological approach.[4]

Six of the original Hefner non-metric traits were incorporated by Hefner and Ousley into the OSSA method for classification of ancestry.[1,4] The scores of each of the traits are then converted into a binary score and summed. Individuals with scores ≤3 are classified as Black (B) and ≥4 as White (W). The OSSA approach includes statistical measures of classification and a prediction plot for group membership. For the current research, these six traits were collected for 208 American Black (n=101) and White (n=107) crania from the Hamann-Todd Human (HTH) Osteological Collection, 28 positively identified Black (n=5) and White (n=23) crania from Mercyhurst University's Department of Applied Forensic Sciences (DAFS) forensic cases, and 38 positively identified Black (n=10) and White (n=28) crania from the Office of the Chief Medical Examiner (OCME) in New York City. Ancestry was first determined using the cut-off scores (≤3 for Black and ≥4 for White) supplied by Hefner and Ousley.[1] The original sectioning point was chosen on the basis of maximizing correct classifications. Next, the cut-off score was heuristically adjusted to maximize classification accuracy for the current sample.

The HTH collection achieved a total correct classification of 68.3% (B=50.5%, W=85.0%) using the suggested OSSA sectioning point. Shifting the sectioning-point heuristically to ≤4 for Black, improved total correct classification of the HTH sample to 77.9% (B=80.2%, W=69.2%). The Mercyhurst sample had a total correct classification of 71.4% (B=20.0%; W=82.6%) using the suggested sectioning score and 89.3% (B=60.0%, W=95.7%) using the adjusted sectioning point of 4. The OCME sample showed a total correct classification of 89.5% (B=70%, W=96.4%) using the suggested sectioning score and 94.7% correctly classified (B=90.0%, W=96.4%) using the adjusted sectioning score of 4.

In the present study, classification accuracy improved in all three samples using the adjusted sectioning point of ≤4 for Black. American Blacks had higher classification accuracy than Whites in the HTH sample (using the adjusted cut-off), yet had lower correct classifications in the DAFS and OCME samples. Secular change may potentially explain these differences given the time disparity between the HTH sample and the two modern ones. It is suggested when examining modern, forensic cases to increase the cut-off score to 4 for best classification accuracy. Furthermore, practitioners should have adequate experience in scoring the traits as defined by Hefner and Ousley, as well as be sufficiently familiar with the normal range of human variation to confidently score each of the traits.[1]

References:

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