



A92 The Accuracy of Estimating Ancestry in Undocumented Migrants Along the South Texas Border Using Dental Morphological Traits: A Comparison to Craniometrics

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After attending this presentation, attendees will understand the advantages and disadvantages of using dental morphological traits and craniometrics to estimate the ancestry of Hispanic individuals.

This presentation will impact the forensic science community by testing the validity of using dental morphology to estimate ancestry in Hispanic individuals and by comparing dental morphology to more traditional craniometric results.

Ancestry estimation is an essential factor of the biological profile, but accurately estimating ancestry in Hispanic individuals is difficult.¹ While it is customary to use craniometrics to quantitatively estimate ancestry of unknown individuals, the use of dental morphological traits for ancestry estimation is becoming more common. In this presentation, the accuracy of discriminant function equations using dental morphological traits established by Edgar and traditional craniometrics to differentiate between Hispanic and non-Hispanic individuals were compared.² The goal is to determine if these two accepted methods of ancestry estimation can accurately classify undocumented migrants discovered along the South Texas border.

The sample consists of ten individuals (nine male, one female) discovered along the South Texas border who are thought to be Hispanic based on anthropological analyses and cultural profile. A total of 13 dental traits were observed and scored on both antimeres, when present, using the Arizona State University Dental Anthropology System (ASUDAS) and the expression count method.³ The expression count method uses the more complex or higher score of the antimeres to represent the scored trait for that individual.⁴ Only permanent maxillary and mandibular teeth were observed and scored. Those teeth that exhibited wear, breakage, caries, modification, or calculus were observed to the extent possible. A discriminant function equation established in Edgar was used to differentiate between Hispanic and non-Hispanic. The rate of accurate Hispanic classification was then compared to the rate of accurate craniometric classification.

Standard craniometric landmarks were taken with a Microscribe® G2 3D digitizer and recorded using 3Skull. Twenty-four inter-landmark distances were then imported into FORDISC® 3.0 in order to estimate ancestry. FORDISC® is a program that uses discriminant function analysis to classify individuals into ancestral groups in reference to data from the Forensic Data Bank (FDB).¹ Each individual was compared to four ancestral groups in FORDISC®: White, Black, Hispanic, and Guatemalan. These four groups were chosen to be consistent with Edgar sample groups of Spanish-speaking regions that include South America, Cuba, Mexico, and Puerto Rico.²

Results from a sample of $N=10$ revealed that the two methods do not give similar ancestry estimations. According to the dental results, one out of ten individuals classified as Hispanic, while the craniometric results indicated that five out of ten individuals classified as Hispanic (one of which was Guatemalan). Further, of the ten individuals, ancestry estimations for only three individuals matched between both methods. A goodness of fit was used on the results and showed that there is a statistical significance between the two methods at the 95% confidence level; however, these results may be due to the small sample size of $N=10$.



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Reference(s):

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Ancestry Estimation, Dental Morphology, Craniometrics