



Anthropology Section - 2016

A96 A Reassessment of Walker Cranial Non-Metric Traits on Undocumented Border Crossers Along the South Texas Border

Brittany S. McClain, BA*, Texas State University, 8901 Jesse James Drive, Austin, TX 78748; Cassie E. Skipper, BS, Texas State University, New Braunfels, TX 78130; and Marilyn Isaacks, BA, Texas State University, 15931 Watering Point Drive, San Antonio, TX 78247

After attending this presentation, attendees will know to proceed with caution when sexing Hispanic crania using Walker visually assessed cranial traits as Hispanic populations do not exhibit the full range of cranial morphological variation assumed in this method.

This presentation will impact the forensic science community by aiding in this humanitarian effort to identify and repatriate these individuals by acknowledging the necessity for population-specific techniques and to make other researchers aware of the potential issues when solely using crania for sex estimation.

The increase in undocumented border crosser deaths in the harsh environments along the South Texas border has created a present humanitarian disaster in which forensic anthropologists must utilize all available skeletal resources, even when little remain. The problem is especially acute in Brooks County, TX, where remote ranchland is abundant, thereby making it easier for migrants to cross the Texas-Mexico border, although it is also more perilous due to weather conditions. Project Operation Identification (OpID) was created at Texas State University in response to the increasing border crosser fatalities. OpID addresses this humanitarian disaster and serves to identify and repatriate the skeletal remains of undocumented border crossers who died crossing the South Texas border.

The unforgiving Texas environment can both limit the recovery of skeletal elements and lead to poor preservation. As a result, OpID utilizes all available skeletal material to create a biological profile. When pelvic skeletal elements are not present to estimate sex, the cranium is used as an alternative and analyzed using the Walker non-metric sexing method, which is based on scoring visually assessed cranial traits.¹ This method has traditionally been used on all populations without dispute when no other appropriate technique is available for the specific population.

It is currently unknown whether Hispanic populations exhibit the full range of cranial morphological variation assumed in the Walker scoring system. The current research serves to test the applicability of the Walker cranial non-metric sexing method to a Hispanic sample and to discern if these individuals express the expected full range of variation. Inter-observer reliability between the three researchers was assessed and confirmed prior to scoring the crania. The OpID crania were seriated based on each of the five traits and scored separately. Twenty-one crania were scored for nuchal crest, mastoid process, supra-orbital margin, and glabella. Because one individual was missing a mandible, only 20 crania were scored for mental eminence.

The results for each trait were analyzed using a logistic regression equation provided by Mercyhurst University to estimate sex, Chi-square goodness of fit, and Cramer's V (0.584, p -value=.02).² The Chi-square results of this preliminary study show the estimated sex of the OpID individuals based on pelvic morphology is significantly different from the sex estimated using the Walker cranial non-metric method ($X^2=7.853$, $df=2$, p -value=.02); however, there was a strong correlation between sex and the traits scored (Cramer's V=0.584, p -value=0.02). Further, the Hispanic sample tested did not exhibit the full range of variation for nuchal crest, supra-orbital margin, and mental eminence described in the Walker article. While the Walker method can be used to estimate sex when only crania are present, researchers should express caution when using this method until the scores are shifted to more accurately represent the Hispanic population.

In conclusion, the sampled Hispanic crania do not exhibit the full range of variation outlined in Walker.¹ To sex the crania of Hispanic individuals, a more appropriate method should be employed and utilized to account for the range of variation exhibited by Hispanic crania. The impact of the present research will aid in this humanitarian effort to identify and repatriate these individuals by acknowledging the necessity for population-specific techniques and to make other researchers aware of the potential issues when solely using crania for sex estimation.

Reference(s):

1. Walker PL. Sexing skulls using discriminant function analysis of visually assessed traits. *Am J Phys Anthropol* 2008;136(1):136-139.
2. Ousley S. Walker non-metric sex estimation spreadsheet 1.0. Mercyhurst University Archaeological Institute, n.d.

Undocumented Border Crossers, Sex Estimation, Cranial Non-Metric Traits

Copyright 2016 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.