

A76 Sex Estimation Methods in Forensic Anthropology: Current Practice and Trends

Alexandra R. Klales, Washburn University, Topeka, KS; Kate M. Lesciotto, University of North Texas Health Science Center, Fort Worth, TX*

Learning Overview: The goal of this presentation is to inform attendees about the current state of skeletal sex estimation in forensic anthropology, including practitioner preferences, reporting practices, and trends across time.

Impact Statement: This presentation will impact the forensic science community by reporting on the variation within the field for sex estimation from the human skeleton.

Estimation of sex is generally the first step when constructing the biological profile of an unidentified individual, primarily because many of the other biological profile parameter methods are sex-specific. However, method selection and reporting vary considerably across practitioners. An electronic research survey was distributed to forensic anthropology educators, practitioners, and students to understand more about the methods used by forensic anthropologists to estimate biological sex, as well as the factors that influence decisions regarding method selection. This survey (IRB# 2022-105) asked demographic questions about each participant's level of education and forensic anthropology casework experience and questions about sex estimation methods. A total of 150 survey responses were collected, with 119 participants completing some or all of the questions analyzed in this study.

Most respondents (93.3%) held a graduate degree in anthropology (MA, MS, or PhD), and 39.5% were American Board of Forensic Anthropology (ABFA) diplomates. Nearly all respondents preferred to combine metric and morphological methods to estimate sex. A rank system was used (1=most informative to 4=least informative) to rank skeletal regions by preference for sex estimation based on data type. For morphological methods, the pelvis was overwhelmingly preferred as the best indicator of sex (average rank 1.1), followed by the skull (2.1), long bones (2.9), and other regions (4.0). For metric methods, long bones were the most preferred skeletal region (1.7), followed by the skull (2.1), pelvis (2.2), and other regions (4.0). Participants were also provided with ~25 methods and were asked to indicate the likeliness of using those methods (1=extremely unlikely to 5=extremely likely). The most preferred sex estimation methods in order of average rating were FORDISC® (4.6), Klales et al. 2012 (4.4), MorphoPASSE (4.3), Walker 2008 (4.2), and Spradley and Jantz 2011(4.0).¹⁻⁵ Respondents' decision-making process for selecting a particular method for estimating sex is frequently influenced by: (1) whether the method has been subjected to independent validation and error studies, (2) personal experience with the method, and (3) the type of equipment needed. When using multiple methods to estimate biological sex and the methods do not agree, most respondents indicated that they present the results from all methods utilized, but their final estimate is based upon their personal experience and general impression of the remains (37.1%) or they give preference to methods using pelvic traits or measurements (35.1%).

The results from this survey were compared to a previous survey on sex estimation conducted by Klales 2013, with surprisingly similar results.⁶ FORDISC® and the three pubis traits (ventral arc, subpubic contour/concavity, and medial aspect of the ischio-pubic ramus) remained the most preferred methods/traits; however, the Klales et al. 2012 and MorphoPASSE revisions have replaced Phenice 1969 as the more commonly preferred method since the 2013 survey.^{2,3,7} Since the 2013 survey, more respondents have indicated that they prefer to use *both* metric and morphological methods, rather than a preference being given to morphological methods when only one data type was used to estimate sex. Respondents also showed a high likelihood of using a method that combined data from multiple skeletal regions. The current paucity of methods that combine both metric and morphological data from multiple regions suggests opportunities for future method development.

References:

1. Jantz, R. L., & Ousley, S. D. (2005). *FORDISC® 3.0. computer program*. Knoxville, TN: University of Tennessee Knoxville.
2. Klales, A. R., Ousley, S. D., & Vollner, J. M. (2012). A revised method of sexing the human innominate using Phenice's nonmetric traits and statistical methods. *American Journal of Physical Anthropology*, 149, 104–114.
3. Klales, A. R., & Cole, S. J. (2018). *MorphoPASSE: The morphological pelvis and skull sex estimation database manual*. Version 1.0 Topeka, KS: Washburn University.
4. Walker, P. L. (2008). Sexing skulls using discriminant function analysis of visually assessed traits. *American Journal of Physical Anthropology*, 136, 39–50.
5. Spradley, M. K., & Jantz, R. L. (2011). Sex estimation in forensic anthropology: Skull versus postcranial elements. *Journal of Forensic Sciences*, 56(2), 289–296.
6. Klales, A. R. (2013). Current practices in forensic anthropology for sex estimation in unidentified, adult individuals. In: *Proceedings of the American Academy of Forensic Sciences*, 65th Annual Scientific Meeting, Washington, DC. 2013. 19(H81), 439–440.
7. Phenice, T. W. (1969). A newly developed visual method for sexing the *os pubis*. *American Journal of Physical Anthropology*, 30, 297–302.

Sex Estimation; Practitioner Preferences; Methods