

Sex Estimation in the Forensic Anthropology Classroom: Some Students Wonder, Where do I fit?

Keywords

Forensic Anthropology; Biological Profile; Sex Estimation; Gender; Transgender; Non-binary

Abstract

Forensic anthropology students learn to estimate the sex of an individual from their skeletal remains, which is important in creating a biological profile for the decedent. Traditional methods posit a classification of very female, female, indeterminate, male, and very male. The fact is that neither intersexuality nor gender identity have been included as part of the practice is not lost on university students who are increasingly emboldened to reveal their own identities. We call upon forensic anthropologists to recognize non-binary sex and transgender identities as part of best practices moving forward.

Introduction

Forensic anthropology is a popular academic discipline. During the 2021-22 school years 123 students were enrolled in an introductory forensic anthropology class at Western Oregon University (WOU), reaching full capacity each semester. The course covers the fundamental principles of the discipline, including the methods used in creating a biological profile of the decedent. Along with age and ancestry estimation, sex estimation is a hallmark procedure used in the identification of human remains. The underlying assumption is that biological sex in humans is binary and, although the traditional methods produce results that lie along a continuum, the goal has generally been to determine whether the skeletal features most closely align with an individual that was male or female. Indeed, one forensic anthropology textbook states that “For scientists, sex is a biological fact, whereas gender is a socially ascribed and perceived identity” and “We must remember that when a police officer asks for the ‘gender’ of a unknown decedent, it is not a question of how that individual dressed, acted, or performed various roles in society, but rather a very simple question of biological ‘male’ or ‘female’ [1]. Indeed, perceived identity cannot always be taken into account when examining skeletal remains. Presenting sex as one of two categories certainly simplifies the dissemination of information, and expediency is important for law enforcement. It’s much easier to look for a missing male or female than it is for someone who was intersex or identified as gender-fluid, gender non-conforming, agender, etc.

However, questions have increasingly surfaced in the classroom such as: What if someone doesn’t identify as male or female? Why don’t the methods speak to the 1.2 million people in the United States that identify as non-binary [2]? Co-author Cockrill, a student at WOU, wonders “would I be identified correctly given my transgender status”? Currently, there is no reasonable answer. The American Board of Forensic Anthropologists (ABFA) describes a forensic anthropologist as someone who (in part) estimates an individual’s biological sex (male or female) [3]. The leading organization of



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certified forensic anthropologists does not present a non-binary option. Yet, in the 2021 ABFA Code of Ethics Section I, i) it is written that forensic anthropologists must “respect the individual and collective rights of others and not discriminate on the basis of age, race, color, ethnicity, national origin, sex, sexual orientation, gender identity and/or expression, marital status, place of birth, physical or mental disabilities, and/or professional standing” [4]. Is it possible to respect one’s sex or gender identity yet not include them in the investigative process? We argue that forensic anthropologists have a moral and professional obligation to apply the scientific method to sex estimations both accurately and honorably, but we are missing the mark on both accounts.

Beyond John and Jane Doe

Forensic anthropologists would benefit first by standardizing definitions of sex and gender. In biology we know there are numerous examples of animals that don’t exist as wholly male or wholly female. Some animals, like the clownfish, may change from one sex to another. Others, like slugs, have both male and female reproductive organs. In humans, too, there is a lot more variation than we have been willing to recognize in science and society at large. Anthropologist Agustín Fuentes addresses the issue quite succinctly stating that of the 140 million babies born last year, 280,000 did not exhibit clear male or female genitalia [5]. The ambiguity seen in external sex organs is just one example of a multitude of developmental complexities involving our chromosomes and hormones that blur the line between male and female [6]. But for all of history’s scientific advancements there never seemed to be an opportune time for embracing the wonders of this particular phenomena. In the postcolonial U.S., at least, we have done well to create a culture of secrecy surrounding intersexuality. Thus, we’ve been duped into thinking that, in humans, binary sex, like biological race, is something salient for the entirety of our species.

Gender identity, a social construct, has its own set of problems but at least we do better to accept that it exists. Forensic anthropology’s sibling discipline, cultural anthropology, has helped to inform us of the varying cultures that, through time, have recognized three or more genders. Transgender, a term used to describe people whose

gender identity doesn't conform to birth-assigned sex [2], is just one of many non-binary terms that have become part of the vernacular in the U.S.

Forensic anthropologists must parse out the essence of the terms sex and gender. Once we accept that neither sex nor gender uniformly exist as binary, forensic anthropologists should work to update their codes of ethics and improve best-practices. A new set of inclusive techniques can then be introduced to the entire classroom, so every student's identity is understood to be part of the practice.

This isn't Forensic Anthropology's 'First Rodeo'

Forensic anthropologists are familiar with changing paradigms predicated upon antiquated and false notions. The discipline has been experiencing a rebirth regarding another important part of the biological profile - biological affiliation or ancestry, formerly referred to as race. It's worth noting that the skeletal anatomy involved in sex estimation is also population-specific, contingent on the individual's ancestry. When the principal author began teaching in 2005 there were three categories of race in which skeletal features were generally thought to be situated: Caucasoid, Mongoloid, and Negroid. While most practitioners recognized the limitations of assigning typological "race" using inaccurate and dehumanizing categories, it wasn't until recently that some of those forensic anthropologists started to question this approach more formally and thoroughly through research. In 2019 the American Association of Physical Anthropologists (now American Association of Biological Anthropologists) adopted a Statement on Race and Racism that asserts "Humans are not divided biologically into distinct continental types or racial genetic clusters. Instead, the Western concept of race must be understood as a classification system that emerged from, and in support of, European colonialism, oppression, and discrimination" [7]. While the practice of assigning a socially constructed race to skeletal features persists, albeit using new and improved techniques, many still raise the question as to whether these estimates are really helping to solve missing person cases or serving to perpetuate fallacious concepts of race [8]. Shouldn't we be asking similar questions about sex and gender?

Sexual Maturity - Forensic Anthropology Grows Up

To be clear, distinguishing male and female sex from adult skeletal remains has always been considered estimation with varying levels of accuracy in the methods and precision in the results. Estimating sex of sub adults under 12 years of age or prior to puberty is not advisable. Molecular methods are the most accurate in confirming the presence or absence of the Y-chromosome but can be costly and prohibitive depending on the condition of the bone(s), not to mention the method presumes that chromosomes also correlate nicely to male or female, which they may not. For individuals over the age of 18, the most common approach is based on the visual observation of certain morphological features. Bones of the pelvis, which are most closely tied to reproduction, are considered the best indicators of sex but bones of the skull and other skeletal elements are also used [9-16]. Features are scored as 1-5 with 1 exhibiting a typically female shape, 5 a typically male shape, and 3 an indeterminate shape. One might describe an individual with a score of 2 as probable female and 4 as probable male, but no one seems to know what 3 means other than it

is neither typically male nor typically female. In *The Descent of Man*, Darwin said "Ignorance more frequently begets confidence than does knowledge" [17]. Perhaps forensic anthropologists have fallen prey to this very condition, confidently assigning human remains as male or female without considering sex outside of this binary. The methods are reliable; they're producing the same results as the original, but the original might have been based on an *a priori* assumption.

In the classroom, co-authors Weitzel and Cartales tell students that gender is not something we can determine using skeletal remains alone. But students quickly become aware that even when assessing sex, results don't always land neatly as male or female; features often fall along a continuum, exhibiting some degree of phenotypic overlap or ambiguity [18,19]. It's that ambiguity that has conventionally been ignored - until now.

There has been an uptick of research in forensic anthropology aimed at readdressing sex and introducing gender [20-25]. There is even a trans-led task force that focuses on locating and researching cases of LGBTQ+ persons [26], especially those who may have identified as transgender. Transgender individuals that have not undergone any kind of physical transitioning will likely retain the characteristics they were born with and will exhibit features that may be classified as male or female regardless of their gender. But what about intersex individuals?. Intersexual persons may not be the majority, but they are equally human and should have an equal chance of being identified. We need to start asking: What does intersex skeletal anatomy look like? When features are scored as 3 or indeterminate does it mean the features themselves are neither male nor female? Does it mean the individual was neither male nor female? Or does it simply mean the method is unable to provide the information we are looking for? Further questions arise when it comes to transgender individuals who have sought to alter their appearance to better reflect their gender. What do bones look like from someone who undergoes gender-affirming surgery (GAS) or gender-affirming hormone therapy (GAHT)? Some aspects of forensic anthropology may evolve slower than others, but the discipline has always drawn from interdisciplinary research in an effort to improve, which we must continue to do in order to answer these questions.

Conclusion

All students taking forensic anthropology should be taught that the criminal justice system is working to make sure they are part of the human death investigation process.

Unfortunately, non-binary individuals do experience high rates of violence but that shouldn't be the sole reason for introspection and scholarly growth [24,25]. Discrimination and marginalization will likely continue to be a part of the death investigation process and societies and their institutions must protect individuals from this. But let us first ensure that the offender is not the very premise upon which sex estimation rests.

References

1. Berg G (2013) Determining the sex of unknown human skeletal remains. In: Tersigni-Tarrant M and Shirley N (Editors) *Forensic anthropology: An introduction*. CRC Press. Taylor & Francis Group. 139-140.
2. UCLA School of Law Williams Institute (2021) *Nonbinary LGBTQ Adults in the United States*.

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3. American Board of Forensic Anthropology (ABFA) (2021) Common Law Enforcement Questions.
4. American Board of Forensic Anthropology (ABFA) (2021) Code of Ethics and Conduct.
5. Fuentes A (2022) Biological science rejects the sex binary, and that's good for humankind. Science. The Wire.
6. Ainsworth C (2018) Sex redefined: The idea of 2 sexes is overly simplistic. Scientific American.
7. American Association of Biological Anthropologists (AABA) (2019) AABA Statement on Race and Racism.
8. Pilloud M, Skipper C, Horsley S, Craig A, Latham K, et al. (2021) Terminology used to describe human variation in forensic anthropology. Forensic Anthropology 4: 4.
9. Klaes A, Ousley S, Vollner J (2012) A revised method of sexing the human innominate using Phenice's nonmetric traits and statistical methods. Am J Phys Anthropol 149: 104-114.
10. Phenice TW (1969) A newly developed visual method of sexing the ospubis. Am J Phys Anthropol 30: 297-302.
11. Walker P (2005) Greater sciatic notch morphology: Sex, age, and population differences. Am J Phys Anthropol 127: 385-391.
12. Buikstra JE, Ubelaker DH (1994) Standards for data collection from human skeletal remains. Arkansas Archeologic Survey Res Series No. 44.
13. Garvin HM, Klaes AR (2018) A validation study of the Langley et al. (2017) decision tree model for sex estimation. J Forensic Sci 63: 1243-1251.
14. Garvin HM, Sholts S, Mosca L (2014) Sexual dimorphism in human cranial trait scores: effects of population, age, and body size. Am J Phys Anthropol 154: 259-269.
15. Spradley K, Jantz RL (2011) Sex estimation in forensic anthropology: skull versus postcranial elements. J Forensic Sci 56: 289-296.
16. Walker P (2008) Sexing skulls using discriminant function analysis of visually assessed traits. Am J Forensic Anthropol 136: 39-50.
17. Darwin C (1871) The descent of man: and selection in relation to sex.
18. Bartholdy B, Sandoval E, Hoogland M, Schrader S (2020) Getting rid of dichotomous sex estimations: why logistic regression should be preferred over discriminant function analysis. J Forensic Sci 65: 1685-1691.
19. Sofaer J (2006) The body as material culture: a theoretical osteoarchaeology. Cambridge University Press: Cambridge, UK.
20. Curate F (2022) The estimation of sex of human skeletal remains in the portuguese identified collections: history and prospects. Forensic Sci 2: 272-286.
21. Hollimon S (2011) Sex and Gender in Bioarchaeological Research: Theory, method, and interpretation. In Social Bioarchaeology. pp. 147-182.
22. Hollimon S (2017) Bioarchaeological approaches to nonbinary genders: case studies from native North America. In Exploring Sex and Gender in Bioarchaeology. Pp: 51-69.
23. Joyce R (2017) Sex, gender, and anthropology: moving bioarchaeology outside the subdiscipline. In Exploring Sex and Gender in Bioarchaeology. Pp: 1-12.
24. Schall, J, Rogers T, Deschamps-Braly J (2020) Breaking the binary: the identification of trans-women in forensic anthropology. Forensic Sci Int 314: 110220.
25. Tallman S, Kincer C, Plemons E (2021) Centering Transgender Individuals In Forensic Anthropology And Expanding Binary Sex Estimation In Casework And Research. Forensic Anthropol. Trans doe Task Force.