



Anthropology Section - 2016

A124 The “Science of Science”: Examining Bias in Forensic Anthropology

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After attending this presentation, attendees will understand one form of bias that impacts the interpretation of human remains in forensic anthropological contexts and will better understand how bias impacts the decision-making process. This presentation will further attendees’ abilities to join the conversation on how best to incorporate objectivity into the application of forensic anthropological methods.

This presentation will impact the forensic science community by detailing an area of bias that has not yet been studied within forensic anthropology and by engendering a discussion of bias, which is needed to understand how to best move forward with hypothesis-driven research, specifically for generating the biological profile of unidentified human remains.

Since *Daubert*, there has been a push within the anthropology discipline to rely more heavily on objective methods.¹ Recently, the subject of bias when estimating biological profile parameters through non-metric methods has begun to be addressed in relation to objectivity.^{2,3} Bias can be introduced into forensic investigations in many ways. The role of forensic anthropologists and scientists is to remain objective; however, recent studies have shown that cognitive bias does impact the interpretation of human remains, as well as the final conclusions drawn, when additional contextual information is provided.^{2,3}

The observers’ conclusion when assessing biological profile parameters can often “result from expectations about the results of an observation, and such expectations often come either from explicit messages or from subtle cues about the thing to be observed.”⁴ The goal of this research is to examine the latter, known as the gestalt — that is, the overall impression of the remains when examining individual non-metric traits. To accomplish this, seven experienced observers blindly scored Phenice’s three non-metric traits (ventral arc, subpubic contour, and medial aspect of the ischio-pubic ramus) from one (female) to five (male) based on the descriptions and figures from the Klales et al. method for sex estimation.^{5,6} To limit the potential influence of contextual bias, participants were informed that they were participating in an observer error study, rather than a bias study. Each trait was scored on a separate day. The 15 innominates were randomly arranged with all identifying markers obscured. Only the specific trait being scored was visible; the remainder of the bone was covered to prevent observation of other traits or robusticity of the bone from influencing the scoring process. On the final day, observers were asked to provide an overall impression of sex and score each trait again, but this time they were allowed to examine the entirety of the bone and all traits simultaneously.

The results indicate a strong confirmation bias, whereby “if one has expectations about an event, or hypothesis (i.e., sex estimation) . . . one tends to draw selectively from the available evidence and focus on those items that confirm the working hypothesis.”⁴ When the observer was able to view the entire innominate, including all traits and general size/robusticity, every single observer (100%) feminized or masculinized individual trait scores according to their sex assessment. For example, if the observer originally scored the subpubic contour as 2 (slight concavity), they tended to feminize the score to 1 (well-developed concavity) when they viewed the other traits and estimated the innominate to be female. In the original Phenice article, presence of all three traits was considered to be the female form.⁵ Therefore, it is not necessarily surprising that the female innominates were feminized to a greater degree, especially for the subpubic concavity (100% of specimens were feminized by at least one score by observers). The ventral arc was also heavily feminized (83%), while the medial aspect was more consistent: only 33% of females were feminized and only 44% of males were masculinized. Previous research has shown high observer agreement for each of these traits, which further suggests that bias is more likely the cause of within-individual scoring discrepancies.⁶

Bias from contextual information has been previously identified and, with this research, bias from the gestalt has also been confirmed.^{2,3} Research and methodology in forensic anthropology must remain hypothesis-driven and objective; the next step in the discipline is to begin a discussion of how best to go about accomplishing this task, given the biases known to be present so that we may better understand the science of our science.



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Bias, Non-Metric Traits, Biological Profile