



## Physical Anthropology Section - 2014

### H28 Sex and Ancestry Determination: Assessing the “Gestalt”

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After attending this presentation, attendees will gain an understanding of assessment of sex and ancestral affinity from human crania and how previous training and experience can affect one's ability to quickly and accurately assess sex and ancestry in a quiz-like setting.

This presentation will impact the forensic science community by providing information regarding how the assessment of sex and ancestry from the skull is affected by a combination of training and individual assessment of non-metric traits of the skull.

Visual assessment of morphoscopic traits of the human skull for sex and ancestry determinations is well-known in the anthropologists' tool kit. Assessment techniques are taught throughout basic and advanced osteology classes and are heavily relied upon in forensic case work. Multiple authors have examined the accuracy rates of scoring techniques in the literature. However, the extent to which these techniques are actually derived from an overall impression of the skull that is created within the first few moments of seeing it has not been assessed. The accuracy of the investigator's “gestalt” is explored through a short, timed test and then these results are compared to published accuracy rates.

A 20-skull test was offered during the DOD JPAC-CIL/Missing Person Cases Symposium held last year. Fifty participants agreed to undertake the experiment (n=2,000). Each observer was given 20 seconds per skull to record the sex (male or female) and ancestry (White, Black, or Asian) for each specimen. Participants were asked to circle any answers that they wished to spend more time on. At the conclusion of the test, participants were allowed to re-examine circled answers for as long as they wished, and key an alternate answer, if so desired.

Prior to this test, this study's completed similar tests. One hundred skulls were blindly selected from the Smithsonian Institution's Terry Collection. The test was set up in a series of 5 sets of 20 (one was split into 10s) with 20 seconds allotted to assess sex and ancestry (White or Black) for each skull. Re-examination was allowed at the end of the test (for 50 skulls). At the conclusion of these tests, Dr. David Hunt selected another 20 skulls that contained three ancestral categories (White, Black, and Asian) from the holdings and the test was conducted again (total n=480).

For the first 100 skulls, sex was accurately determined in 82% and 84% of the cases, and ancestry was correctly determined in 85% and 89% of the cases, per investigator. When given the opportunity to re-evaluate the skulls for a longer period of time, the investigators frequently changed a correct answer to an incorrect answer. That is, they were more accurate when their first answer was unchanged. With the addition of a third ancestral category, sex was accurately determined in 85% and 80% of cases, respectively, and ancestry declined to 75% and 60%, respectively.

Results from the larger experiment indicated that sex and ancestry determination is linked to experience and highest degree achieved, with PhD holders out-performing those with lower degrees and/or degrees in related fields. Sex determination was accurately estimated 74% of the time for PhD's, followed by MA's (70%), BA's (69%), and alternate degrees (64%). Ancestry estimation followed a similar pattern, 68%, 55%, 57%, and 52%. A much larger gap is noted in ancestry estimation between degrees achieved, possibly due to the more complex characteristics used in this determination.

The study sex assessments are remarkably accurate, fitting well with published accuracy rates of morphoscopic traits, given the little amount of time spent on the decision. This suggests that each participant has their own “gestalt” about cranial features and that decisions are likely made in the first few seconds of viewing a skull. Similarly, the accuracy of ancestry determinations is relatively high, though not quite as high as several published examples. This suggests that morphoscopic traits are “checked-off” very quickly when examining a skull to provide a “gestalt” assessment. Arguably, much of the “gestalt” is due to initial training, followed by years of experience. A more detailed discussion of these results will be presented at the meeting.

### Physical Anthropology, Sex, Ancestry