

Sex Determination in Subadults Using Auricular Surface Morphology: A Forensic Science Perspective

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ABSTRACT: The determination of sex in subadult skeletons remains a problem for several areas of biological anthropology. To date, univariate and multivariate assessments of sex in the young using adult indicators have failed to produce reliable results. However, research in this area continues.

In 1980, Weaver proposed a modification of adult differences in auricular surface morphology as an effective means for sex determination in subadult remains. His method was indirectly evaluated by Hunt through a comparison of the sex ratios produced by this technique and the expected 1:1 ratio. The present investigation expands upon both studies by using a sample of subadults of known sex, and by evaluating Weaver's method from two perspectives: 1) what percentage of individuals can be correctly sexed using Weaver's criteria? and 2) what is the probability that an individual case will be correctly sexed based on the presence or absence of auricular surface elevation? The first is of interest to those reconstructing population patterns, while the second is critical to the forensic investigator faced with the diagnosis of an individual case.

The sample used in this study consisted of 58 ilia from subadults of known sex ranging in age from birth through 18. In each case, sufficient soft tissues were present to allow absolute sex diagnosis. Each ilium was subjected to a blind examination using Weaver's criteria for auricular surface elevation.

Weaver's technique proved most effective on the males in our sample, with an overall accuracy of 85.3%; however, accuracy in sexing females was only slightly better than chance at 58.3%. Our results corresponded closely to Weaver's own values of 85.4 and 57.7% respectively. Although not significant, the effectiveness of the method improved with age among subadults of both sexes at the population level. The present results suggest that during infancy and early childhood, auricular surface morphology for most individuals conforms to the male pattern.

From the perspective of forensic science, auricular surface morphology proved an effective predictor of sex only among a subset of children older than age nine. All subadults beyond age nine with an elevated surface were female and were therefore diagnosable. However, 26% of our female sample failed to develop an elevated surface thus making the attribute of nonelevation less indicative of male status.

KEYWORDS: physical anthropology, auricular surface, human identification, sex determination

The inability to accurately determine sex in subadult skeletal remains has negatively impacted several aspects of biological anthropology, including paleodemography and paleopathology, as well as forensic-science studies. Subadult sex determination is a pre-

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