

TOWARDS A FRAMEWORK FOR THE INCREMENTAL OPTIMIZATION OF AN AGE-AT-DEATH ASSESSMENT USING THE MACROSCOPIC EXAMINATION OF THE AURICULAR SURFACE OF THE ILIUM

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Background: A macroscopic assessment of morphological changes to the auricular surface of the ilium is one of the most widely used methods for determining age-at-death in osteoarchaeology. A few variants that have been developed so far have received a mixed response, with questions being raised about their accuracy and the too narrow age-at-death intervals. While most methods propose a visual assessment of the entire auricular surface at once, the method developed by Buckberry and Chamberlain, published in 2002, is the only one that proposes scoring each morphological component separately. This approach has the potential for further refinement.

Objective: Current considerations aim to re-evaluate the composite score, which could be adjusted to better reflect the data.

Subjects and methods: In the case of the original scoring procedure, there are five separate traits. Two of these are scored using a five-grade scale, while the remaining traits are scored using a three-grade system. However, this approach, which is dictated by the feasibility and ease of macroscopic identification of particular stages, does not reflect the relative numerical importance of traits when they contribute to the composite score, which is their sum. The simplest solution is to apply different combinations of weights to the whole dataset incrementally and look for improvements in the correlation between age-at-death and the composite score. The proposed procedure was tested using data provided by the original authors and published alongside their paper.

Results and conclusion: Incremental optimization proved to be very computationally intensive; therefore, test runs were performed using a limited weight range, spanning 0–2 with a step of 0.1. Although the resulting weights suggest the need to widen the range, the procedure has improved the overall Spearman's correlation, raising it from 0.624 to 0.651. Once the weights have been determined, the composite score groups should be adjusted.

Keywords: Age-at-death assessment; Osteoarchaeology; Macroscopic evaluation.