A121 Introducing the Macromorphoscopic Databank (MaMD): A Data Collection and Analytical Tool for the Analysis of Macromorphoscopic Trait Data

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After attending this presentation, attendees will be familiar with the newly created MaMD, a data storage repository attached to a data collection and analytical tool for the analysis of macromorphoscopic trait data. Attendees will be better informed concerning the development of this project, the current state of the database, data contributors, and the research/analytical potential of these data.

This presentation will impact the forensic science community by addressing a significant gap in best practice in the forensic anthropological approaches to macromorphoscopic trait data, particularly as those data relate to the estimation of ancestry.

An integral part of the biological profile constructed by forensic anthropologists for unknown human skeletal remains is an estimation of the peer-perceived ancestry for that individual. This estimation is usually accomplished through visual inspection of morphological variants of the cranium and mandible (i.e., cranial non-metric, or macromorphoscopic, traits) and/or through an analysis of measurements of the cranial and postcranial skeleton; however, estimating ancestry using macromorphoscopic traits is not straightforward and often relies on a considerable number of years of experience and an extraordinary understanding of human variation.

The purpose of this presentation is to address this substantial gap in best practice in forensic anthropology. Very little reference data exist — and are publicly available — for the objective analysis of macromorphoscopic trait data. Consequently, forensic anthropologists rely on their own experience or outdated methods having very little empirical support. The fundamental flaw with these two approaches is that they offer no way of estimating error nor are they verifiable as a method. The result is *post hoc* trait selection, experience-based justifications, and anecdotal expert judgement with no empirical support.

This presentation addresses the gap in best practice through the introduction of the MaMD. The purpose of any databank is to serve as a repository of data and to make those data accessible to many end users, or practitioners. To that end, the MaMD serves as a repository for macromorphoscopic trait data obtained primarily from recent and well-documented forensic cases or donated skeletal material. To facilitate data sharing and to maximize analytical output, the databank comprises relational databases housing not only macromorphoscopic trait scores, but also demographic data on each decedent. These include but are not be limited to: age at death, sex, stature, ancestry, place of birth, occupation, self-identified ancestry (social race), etc. All data are maintained in these relational databases on a central server, using a database platform to perform the essential managerial and analytical functions necessary for data management.

The MaMD is populated using Macromorphoscopic Traits (v. 1.61), a newly developed data collection program for 17 macromorphoscopic traits. The end user provides provenience information after data are collected, retaining trait scores to a sample-specific database for subsequent submission to the MaMD. The MaMD currently contains macromorphoscopic trait data for 6,670 individuals. Examples of populations for which data are available include

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samples of modern American Black and White, Hispanic, Guatemalan, Colombian, Fijian, Thai, Japanese, Pacific Islander, and Peruvian.

The MaMD and a forthcoming analytical program utilizing classification algorithms appropriate for categorical data will be available for wider use following extensive beta testing, method validation, and inter- and intra-observer error tests. Forensic anthropology laboratories (applied and academic) are encouraged to assist in the validation and beta testing phase of this research through a data-sharing model similar in scope and function to the Forensic Anthropology Databank.[1] Further refinement of several classification algorithms and the user interface for the analytical program will be completed within the next year.

Reference(s):

1. Jantz R.L., Moore-Jansen P.H. A data base for forensic anthropology. *Report of Investigations No. 47.* Department of Anthropology, University of Tennessee, Knoxville, TN. 1988.

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