



## Physical Anthropology Section – 2009

### H75 Observer Error Analysis Trends in Forensic Anthropology

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After attending this presentation, attendees will recognize research trends in the evaluation and reporting of observer error in the forensic anthropological literature.

This presentation will impact the forensic community by demonstrating the lack of observer error analysis in the anthropological literature over a 28-year period. Furthermore, this research indicates the trends in types of statistical analyses used for observer error analysis, when they are performed. As issues of professional standards continue to be addressed in the courts, it is imperative that anthropologists be proactive by increasing the scientific rigor in developing, comparing, and testing anthropological methods.

Forensic anthropology has recently emerged from a transitional period in which it has been described as the application of physical anthropological analyses in the medico-legal setting. Methods developed within physical anthropology typically explore research questions at the population level, while forensic anthropology focuses more on the individual of a given population. Furthermore, methods of analysis used in the forensic context must meet specific demands due to the evidentiary nature of the results. While methods developed within physical anthropology have little need to recognize the potential legal and social ramifications of unreliable or inaccurate results, the scientific method (regardless of field) demands a certain level of scientific rigor in method development. Since the *Daubert* court ruling, many forensic disciplines have begun to critically evaluate the methods used in their examinations. The ruling has likely contributed to the increased awareness and interest in quantifying, critically assessing, and re-evaluating some of the techniques most often used by forensic anthropologists. The issue of error rates; however, have been less often addressed. This presentation has two goals: (1) evaluate the trends in the types of statistical analyses used for observer error analysis, and (2) demonstrate the overall deficiency in observer error analysis within the literature to encourage discourse among anthropologists in establishing guidelines in this type of analysis.

Anthropological articles from 1980 through 2008 in the *Journal of Forensic Sciences* were evaluated. Keyword searches (e.g., method, technique, statistics, error, bias) were utilized initially, followed by manual reviews of all anthropological articles to determine if an analysis of observer error was warranted for the studies. Any paper that introduced, compared, validated, or modified anthropological methods and techniques was considered as potentially needing observer error analyses. Overall, 269 articles fit the criteria for inclusion in this survey. Each article was evaluated and the inclusion or exclusion of intra- and inter-observer error was recorded.

Out of 269 articles, 189 (70%) provided no analysis of observer error leaving only 80 (30%) that have performed or presented observer error analyses. Furthermore, only 25 studies (9%) performed both intra- and inter-observer analyses. Twenty-nine studies (11%) only documented results from inter-observer analyses, while 26 studies (10%) only provided intra-observer analysis results. Papers reviewed prior to 1986 did not include any analyses of observer error and papers prior to 1990 did not include any analysis of inter-observer error. While it was hypothesized that the amount of studies performing analyses of observer error would increase over time relative to the amount of total research papers published per year, it was discovered that the frequencies simply rise and fall over the years. The types of statistics used over the years to evaluate observer error prove to be just as variable and do not demonstrate any selection trend over time.

As the courts continue to raise the bar regarding professional standards, forensic anthropology must be committed to providing analyses that are of the highest quality. Researchers should carefully select statistical techniques for evaluating observer error and strive to not only identify the error, but explore the cause. Researchers need to be versed in the concepts of bias, repeatability, precision and accuracy so as not to conflate the terms and use them interchangeably. Analyses of observer error are a basic component of the scientific method and assist in evaluating the reliability of our methods. Human variation is a frequent complication in the development of methods within biological anthropology. Differentiating method error from biological variability will assist in providing a baseline interpretation of methods and their variables as useful predictors in skeletal analyses.

#### **Daubert, Observer Error, Statistics**