

A42 Consistency in Validation: Categorizing Validation Studies in Forensic Anthropology

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Learning Overview: After attending this presentation, attendees will understand the current trends in validation studies in forensic anthropology over the past five years, how validation is currently ambiguously defined, and ways these studies can be recategorized to help streamline the research process.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by clarifying what is meant by the term “validation,” how these studies are currently used, and proposing a cohesive definition and understanding of this term. This presentation will suggest new categories of and descriptors for validation studies to help meet the research goals of the forensic anthropology community.

To assess the current state of anthropological validation studies, 438 articles published in the *Journal of Forensic Sciences* ($N=261$), *Forensic Science International* ($N=153$), and *Forensic Anthropology* ($N=24$) as well as 719 presentations given in the Anthropology section at AAFS meetings between 2015 and 2020 were reviewed for the use of the term ‘validation’ in the title, keywords, or abstract.

Of the 438 articles and 719 presentations reviewed, only 37% of articles ($N=164$) and 5.5% ($N=40$) of presentations contained keywords, titles, or abstract information relevant to the term “validation.” None of the 1,157 reviewed articles and abstracts provided a working definition of “validation.” The Forensic Science Standards Board (FSSB) defines validation as: “a process of evaluating a system, method, or component to determine that requirements for an *intended use or application have been fulfilled*” [emphasis added].¹ This is also the preferred definition for the Organization of Scientific Area Committees (OSAC). More than half of the abstracts and papers reviewed instead used “validation” in the context of only the first part of the definition—testing or evaluating methods to determine their applicability to a particular context or population. Results included support for methods, as well as advice against their use.^{2,3} Some abstracts and papers did not offer a solid conclusion as to how or whether a method should be used, but rather advocated for further development.⁴

Finding validation studies in the literature is also problematic. Of the 40 abstracts published in the *Proceedings* of the AAFS that dealt with validation studies, only 14 mentioned the word “validation” in their title, and only 4 abstracts listed “validation” as a keyword. Similarly, for the reviewed journal articles, only 27 had validation in the title, and 9 had validation listed as a keyword; the rest of the articles contained other keywords or abstract information that fit the definition of a validation study. In response to these findings, and in order to make all existing studies more accessible, construction of a central database is proposed.

Building an accurate database of evaluation and validation studies requires consistency in terminology. Reaching consensus on the meaning and use of the term “validation” is critical if the discipline wants to be able to categorize forensic anthropology research effectively. Bethard and DiGangi note the need for validation studies in all aspects of forensic anthropology, especially those areas most likely to be called into question during court proceedings.⁵ To meet the *Daubert* or *Kumho* requirements, the discipline needs to be able to demonstrate that forensic anthropology methods have been tested and meet general scientific merit and discipline acceptance.^{6,7}

To clearly identify publications that are reporting validation of a method (as per the FSSB definition), the use of the word “validation” in the title and as a keyword is recommended. For any publications that present a test of a method or subject area but do not provide support for its use in a particular context, using the word “assessment” in the title and in the keywords is recommended. These suggestions for a more standard approach would also benefit the forensic anthropology community in identifying which areas need further research and work before being considered a best practice for use in medicolegal proceedings.

Reference(s):

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2. Winburn, Allysha P. Validation of the Acetabulum as a Skeletal Indicator of Age at Death. *Proceedings of the American Academy of Forensic Sciences*, 70th Annual Scientific Meeting, Seattle, WA. 2018. 24: A72.
3. Coberly, Samantha W. A Validation Study of the Mandibular Canine Index Method of Sexual Assessment Using Two American Populations. *Proceedings of the American Academy of Forensic Sciences*, 69th Annual Scientific Meeting, New Orleans, LA. 2017. 23: A55
4. Boyd, Derek A. et al. Longitudinal Comparison of the Megyesi and Moffatt Total Body Score (TBS) Methods for Estimating the Postmortem Interval. *Proceedings of the American Academy of Forensic Sciences*, 71st Annual Scientific Meeting, Baltimore, MD. 2019. 25: A63
5. Bethard, John D. and DiGangi, Elizabeth A. From the laboratory to the witness stand: Research trends and method validation in forensic anthropology. In *Forensic Anthropology and the United States Judicial System*, edited by Laura Fulginiti, Kristen Hartnett-McCann, and Allison Galloway, 41-52. Hoboken, NJ: John Wiley & Sons, Inc., 2019.
6. *Daubert vs Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).
7. *Kumho Tire Co vs. Carmichael*, 526 U.S. 137 (1999).

Validation, Assessment, Forensic Anthropology