F32 Bite Mark Analysis: Findings of an Exercise Designed to Measure Accuracy and Reliability

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The primary objective of the experiment is to document and compute the ability of the participants to arrive at the correct associations of dentition to their respective bite marks and to discover that this was an open population condition. The results of this experiment are to be presented at this conference.

This presentation will impact the forensic community and/or humanity by demonstrating the results of this experiment, which using known sources, will establish that bite mark analysis can be reliable and achieve accurate findings when the evidence is of acceptable quality.

Bite mark analysis is a reliable scientific method.

In a laboratory setting, ten individuals' mouth models were used to impress bite marks in two different mediums, modeling clay and the skin of a living human volunteer. One objective of this experiment is to observe the effect on accuracy when comparisons are being made on two surfaces with entirely different dynamics, one being essentially static and the other having the yielding and rebounding phenomenon of human skin.

Digital color Photographs, using a Sony MVC-FD Mavica camera, with appropriately positioned ABFO No. 2 © scale, were taken immediately following the placement of the bite marks. The authors did not want to introduce distortion that is a well known to develop rapidly as a post-injury physiological response.

The authors generated hollow volume overlays of the ten models, using an improved version of the Adobe© Photoshop© technique developed by M. Bowers, DDS, and Raymond Johansen, DMD.

A package containing photographs of the ten models with their respective overlays and photographs of ten bite marks, in black and white and color, were sent to 40 forensic dentists that had agreed to participate in this experiment. The experience level of the participants varied from Diplomate of the American Board of Forensic Odontology, to individuals that only recently entered into this field of interest.

The participants were asked to compare all of the overlays, with all of the bite marks, and to rank their findings according to the seven categories of confidence shown in the 3rd edition of the *Manual of Forensic Odontology.* These categories are:

1. Reasonable medical certainty, to represent the opinion that it is a virtual certainty that this dentition made this mark. This finding may be applied to cases with a few possible responsible individuals or to a situation where there is no limit on the possibilities, also referred to as an open population.

In this experiment, the manner in which the material was formatted and submitted it was the author's intention to lead the participants to assume this is a closed population situation. This would mean that each of the ten models could be associable to only one mark in the clay and one mark in the skin.

The authors did not inform the participants that this was in reality an open population exercise, in that one of the bite marks did not have an associable dentition and one of the ten models did not make any of the bite patterns.

2. Very Probable to mean more likely than not.
3. Possible to say it is consistent and cannot be excludedcould be; may or may not be; can not rule out.
4. Improbable-unlikely the dentition
5. Excluded-eliminated; no match; incompatible; not of common origin.
6. Inadequate information-inconclusive
7. Non-diagnosticof no evidentiary value.

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Bite Mark, Analysis, Reliability

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