NATIONAL COMMISSION ON FORENSIC SCIENCE

National Institute of Standards and Technology
U.S. Department of Commerce

Views of the Commission
Inconsistent Terminology

Subcommittee
Reporting and Testimony

Approved by Commission	04/30/2015

Commission Action

The Commission voted to adopt this Recommendation on April 30, 2015, with a more than two-thirds majority vote (93% yes, 7% no, 0% abstain).

Note: This document reflects the views of the National Commission on Forensic Science and does not necessarily represent the views of the Department of Justice or the National Institute of Standards and Technology. The portion of the document directly labeled "Views of The Commission" represents the formal Views of the Commission. Information beyond that section is provided for context. Views documents do not request specific action by the Attorney General, and thus do not require further action by the Department of Justice upon their approval by the Commission. The National Commission on Forensic Science is a Federal Advisory Committee established by the Department of Justice. For more information, please visit: https://www.justice.gov/ncfs.

View of the Commission

It is the view of the National Commission on Forensic Science (NCFS) that the forensic science community should endeavor to make terminology more consistent within a particular discipline and across disciplines. Adoption of terminology is a fundamental step to clear communication of scientific testing results and conclusions. Clear and consistent language within, as well as across, forensic disciplines will improve communication among scientists, law enforcement, lawyers, judges, and the public. This document summarizes problems that result from the inconsistent use of terminology within and across disciplines.

Background

Why Should Terminology Be Uniform?

In its simplest terms, "[i]t does little good to gather great data and to carefully interpret it—and then fail to effectively share this information with those who need to understand what the data means."[1] Similarly, the National Research Council observed that "[i]nconsistency or ambiguity in terminology can and does have a profound effect on how the trier of fact in a criminal or civil matter

[1] John M. Butler, *Advanced Topics in Forensic DNA Typing: Interpretation*. Chapter 16 – Laboratory Reports: Communicating Results and Conclusions. Elsevier Academic Press 2014.

perceives and evaluates scientific evidence."[2] Inconsistent terminology also prevents other forensic experts from meaningfully assessing or relying on an expert's finding or opinion.

Outside of forensic science, the international Joint Committee for Guidelines in Metrology, which produced the International Vocabulary of Metrology (VIM) framed the importance of clear and unambiguous language as follows:

Scientists from different sectors often attach different words to the same concept; this makes interdisciplinary conversations very difficult and confusing. There needs to be a common language that is clear and unambiguous. The first thing one does when learning any new language is to acquire a vocabulary, which will grow in time. Anyone learning a new language will know that there are many peculiarities in any language, from words that can have different meanings depending on the context, to words that sound the same but are spelled differently and obviously have a different meaning. In English the word 'standard' has often been cited as an example of a word with many meanings. A detailed knowledge of the language is required to avoid such words causing mistakes, especially for people who do not have English as a first language. Ambiguous terminology also becomes a problem for translators and can be a direct barrier to trade.[3]

To some degree, standardized language is beginning to be incorporated across forensic disciplines.[4] For example, ISO/IEC 17025, a foundational document for accrediting bodies, uses the VIM as a normative reference leading to some standardization of terminology in accredited laboratories.[5] However, the VIM is targeted toward analytical laboratories and addresses only measurements. Forensic practitioners also communicate about inferences and concepts that extend beyond measurements,[6] and they have the additional challenge of communicating with participants in the legal system for whom science is not their first language.

Examples of Inconsistent Language

The NRC Forensic Science Report expressed concern about terms such as "match," "consistent with," "identical," "similar in all respects tested," and "cannot be excluded as the source of." It asserted that these terms can have a "profound effect on how the trier of fact in a criminal or civil case perceives and evaluates scientific evidence."[7] The American Bar Association's Resolution 101C(2) urges judges to regulate the manner in which expert testimony should be presented at trial and to consider whether "experts used clear and consistent terminology in presenting their opinions."[8]

This does not necessarily mean that such terminology should never be used, but care must be given to choosing the most transparent terms and clearly defining them in report writing and testimony. Inconsistent terminology can lead to miscommunication both within and across disciplines. The overstatement or exaggeration of the value and/or limitations of the information and confusion as to the meaning of terminology by the end users can lead to the word's misapplication. Below are

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[2] National Research Council Committee on Identifying the Needs of the Forensic Science Community, *Strengthening Forensic Science in the United States: A Path Forward*, p. 21 (2009). Hereinafter, NRC Forensic Science Report.

[3] V J Barwick and E Prichard (Eds), Eurachem Guide: Terminology in Analytical Measurement – Introduction to VIM 3 (2011).

[4] Id.

[5] Id.

[6] But see Rene' Dybkaer, Definitions of "Measurement", 16, Accreditation & Quality Assurance 479 (2011)(identifying vagueness in the scope of the term "measurement").

[7] NRC Forensic Science Report, supra note 1, at 21.

[8] ABA Resolution 101C(2)

examples of these problems.

Inconsistency in Terminology Both Within and Across Disciplines

Inconsistences in terminology across disciplines can create confusion. When the same terminology is used differently across disciplines and presented in the courtroom to express findings to a nonscientific audience, the subtleties in its use may be lost on the audience.

One example of a term that is used inconsistently in two or three disciplines is the use of the word "perimortem." "When using the term perimortem, medical doctors are referring to the 'person' (body), whereas the forensic anthropologist is referring to bone."[9] The Scientific Working Group for Anthropology (SWGANTH) has attempted to address this "hard-to-define word within the special area of trauma analysis."[10] When defining "perimortem trauma," the organization cautions practitioners by saying, "consideration should be given to: cautious use of the term perimortem, since *it is used with varied temporal precisions* within the forensic community; thus an explanation of the term should be provided with clear reasons for a perimortem classification…"[11]

This use of caution when there is great difficulty in applying a clear and concise meaning to a term is one option. However, robust discussion and careful consideration of the language is crucial. Clarifying, standardizing, or abandoning the use of terminology that is confusing and/or not helpful in furthering communication across disciplines should all be carefully considered.

Another example is terminology used to express the potential association between two objects in comparative practices. Terms such as "match," "consistent with," "excluded," and "inconclusive" are used in various disciplines to describe the relationship between an evidentiary sample, often called a "question" sample (Q) and a "known" sample (K). These definitions can express dramatically different values in the comparisons depending on the discipline, as well as there being disagreement within disciplines.

"Inconclusive" is one of these terms. The Association of Firearm and Tool Mark Examiners has defined this word to describe three separate situations:

A. Agreement of all discernible class characteristics and some agreement of individual characteristics, but insufficient for an identification.

B. Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility.

C. Agreement of all discernable class characteristics and disagreement of individual characteristics, but insufficient for an elimination.[12]

In DNA typing, "inconclusive" is used in a similar way to mean instances when a practitioner cannot clearly include or exclude a known profile from a question sample. Yet in DNA, the causes for such a statement are varied. The original Q sample yielded no data or limited data due to the quality of the sample from degradation, inhibition in the amplification process, or a low amount of DNA. A second possibility might be that there is too much information from multiple contributors (a complex mixture), making the sample too complex to interpret.[13]

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[9] Ann S. Bunch, National Academy of Sciences "Standardization": On What Terms?, J. Forensic Sci., July 14, Vol. 59, No. 4, dio: 10.1111/1556-4029.12496, available online at: onlinelibrary.wiley.com. (Providing a detailed discussion on the multiple definitions, origins, and use of these terms in medicine and forensic anthropology).

[10] Id.

[11] Id., quoting SWGANTH web site (Trauma Analysis section dated 5/27/2011)(the language referenced on the SWGANTH web site remains the same as January 6, 2015).

[12] Association of Firearm & Tool Mark Examiners, *Glossary*, 6th Edition, version 6.120414 (2013).

[13] John M. Butler, *Advanced Topics in Forensic DNA Typing: Interpretation*, Chapter 16 – Laboratory Reports: Communicating Results and Conclusions, Elsevier Academic Press 2014. See also SWGDAM Guidelines.

An explanation in reporting "inconclusive" can create some clarification, but choosing more consistent terminology could avoid the confusion all together.

One of the problems with the use of similar or identical terms to describe different values in different disciplines is the confusion these definitions can cause in the courtroom. If "consistent with" or "match" means one thing in one discipline and has a totally different value ascribed to it in another, a lawyer, judge, or juror is left to not only try to understand the nuance of the particular discipline but also to sort out the confusion in different terminology. In the minds of most jurors, words such as "match" mean that the compared items come from the same source and none other.[14]

Because the vast majority of criminal cases settle prior to trial, there is great danger in the reader misunderstanding the message and then misapplying the information when investigating a potential suspect, charging an individual with a crime, explaining findings to a victim or the public, or advising a client about whether to enter into a plea agreement. Each of these scenarios can have deleterious results, such as an individual not being charged with a crime when he or she should have been, others accused of crimes when they should not be, or not properly assessing the strength of a prosecution or defense. These scenarios are not highlighted by appellate cases, which typically address a miscarriage of justice when someone has been wrongfully convicted, but the harm can be just as great. Commissioners did not have a specific example of how this manifests itself, but understand that there are many practitioners who have dedicated hours of time discussing and exploring ways to better communicate the meaning of findings such as "inconclusive."

Overstatement or Exaggeration of Meaning and/or Limitations

When terms are not clearly defined, they might not convey their intended meaning. In *Williamson v. Reynolds*, for example, an expert testified that hair samples were "consistent microscopically."[15] The question becomes, "what does this term mean?" Does it mean the same as "consistent with?" Without further explanation, which was not provided, the evidence may have little probative value, but the jury may not appreciate this fact.[16] In fact, in *Williamson*, the problem was exacerbated because the expert during the trial went on to explain: "In other words, hairs are not an absolute identification, but they either came from this individual or there is— could be another individual

[14] Statistics are used in DNA typing to express the value of a comparison. The use of statistics can be a powerful tool to express the value of the comparison but statistical modeling will also have to address the challenges that come with the use of different statistical models answering different questions and the challenges in expressing these nuances to a non-scientific audience.

[15] *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okl. 1995), *rev'd sub nom. on this ground*, Williamson v. Ward, *110 F.3d 1508, 1523 (10th Cir. 1997).*

[16] Some believe that microscopic hair analysis should not be used as an example of inconsistent terminology, because this particular field has been the subject of great criticism; the problems extend beyond inconsistent terminology and instead highlight the problems involved in testifying outside the limits of science. However, this example provides a concrete real life example of what can and does occur when practitioners try to explain poorly defined terminology. The community as a whole has made and continues to make attempts to respond in these cases. For example, in April of 2013, ASCLD/LAB Board of Directors sent notice to their membership recommending that laboratories consider appropriate action in reviewing cases. http://www.ascld-lab.org/notification-from-the-ascldlab-board-of-directors-to-interested-parties-concerning-potential-issues-with-hair-comparison-testimony.
The work that the FBI, the Innocence Project, and the National Association of Criminal Defense Lawyers are doing in an attempt to rectify errors caused by this analysis also serves as an example of how stakeholders working together can improve the system as a whole. In the context of inconsistent terminology, this example highlights a challenge present in several other pattern and impression evidence disciplines that struggle with how to express and measure the value of their comparisons. Their intentions and efforts are laudable. This example as well as others are designed only to assist practitioners in further improving communication and the overall practice of forensic science, something this Commission is deeply committed to.

somewhere in the world that would have the same characteristics to their hair."[17] This phrasing suggests that very few people in the world would have "consistent" hair—erroneous.

This example highlights the problem with terminology that overstates the value of the information in the context of testimony. When examiners are trying to explain their findings but do not have clear and concise terminology upon which to rely, there is a temptation to try to clarify, which can lead to redefining the term, sometimes overstating the conclusion and creating even more confusion.

The same lack of clarity in report writing can lead to just as damaging results, as it drives the decision making process of the reader, who could also misunderstand terminology that is not clear and consistent. Although it is not certain that concise and properly defined terminology would have totally avoided this problem, such enhanced terminology makes it unnecessary for the attorney to press an expert for clarification, and gives the expert a clear and concise definition to rely on rather than creating some variation on the fly.

Confusion as to Meaning and Misapplication as a Result

This challenge is often tied to the temptation to overstate or redefine a term, and therefore exaggerate its meaning. However, this problem is directly related to the failure of the user of the terminology to fully understand the meaning. One of the challenges that is in some ways unique to forensic science is the fact that the end users and some analysts often do not have scientific backgrounds and do not regularly use the language of science. Law enforcement, lawyers, and judges need to learn the language; inconsistent terminology within and across disciplines further compounds this challenge. When lawyers misconstrue terms, they may unintentionally mislead others. In *Williamson*, for instance, the prosecutor argued in closing, to the jury, in respect to the hair evidence, "there's a match."[18] This statement completely misrepresented the expert testimony and ignored the limitations of the technique. Given that the term "match" is also commonly understood as the kind of "match" popularly associated with fingerprints or DNA profiles, the statement becomes even more damaging.[19] Again, would having had a clear and concise definition originally for the value of this evidence avoided these problems? It is very hard to say, but it would be a step forward to have a clearly defined, uniform term that is properly articulated. There are more than one set of challenges that lead to an example such as this. One study suggested that presentation of the limitations of forensic science during trial through cross-examination or jury instructions might do very little to cure the problems surrounding overstatement in the courtroom.[20] But having terminology that is clearly defined in a written, standardized format might assist those charged with these responsibilities into imposing limits on how terms are used.

Forensic terminology must also be understood by juries and the public. Even an explicit definition and statement may not be fully appreciated when terminology deviates from common usage. An example comes from a study that looked at language adopted by the American Board of Forensic Odontology (ABFO) to encourage its members to use particular terms to express their

[17] *Williamson*, 904 F.Supp. at 1554.

[18] *Williamson*, 904 F. Supp. at 1557.

[19] Two studies suggest that this is how jurors and college students tend to interpret it. See McQuieston-Surett & Saks The Testimony of Forensic Identification Science: What Expert Witnesses Say and What Factfinders Hear, 33 *Law & Hum. Behav.* 436, 451 (2009) (potential jurors); Dawn McQuieston-Surrett & Michael J. Saks, Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy and Impact, 59 *Hastings L.J.* 1159 (2008) (students).

[20] *See* Dawn McQuieston-Surett & Michael J. Saks, The Testimony of Forensic Identification Science: What Expert Witnesses Say and What Factfinders Hear, 33 *Law & Hum. Behav*. 436, 451 (2009)("These results should give pause to anyone who believes that the traditional tools of the adversarial process (e.g., cross-examination, opposing experts, instructions) will readily undo the effects of misleading expert testimony.")

conclusions.[21] The Board defined the terms "reasonable scientific certainty," "probable," consistent (with)," and "match" to express the highest to lowest degree of similarity in a comparison analysis.[22] When researchers asked undergraduate students to rank these terms, without being provided the ABFO's definitions, most of the students put "match" at the top of the list.[23] When a term commonly used and understood is redefined to have a conflicting technical meaning, the common understanding may stand in the way of comprehension and correct application.

This type of inconsistency can lead to great misunderstanding. Because many of the terms found in reports are used to make decisions about a case outside of the courtroom and often without consultation with the report writer, such as whether to further investigate, charge a suspect, or enter into a plea bargain, consideration must be given to whether terminology is also consistent with its general nonforensic use. In some ways, this is much like the standardization work done by those involved with the VIM in standardizing across disciplines, such as chemistry and biology, when expressing measurement.

Another example of this kind of challenge is the word "reliability." "Reliability" in science refers to the precision, consistency, reproducibility, limitations, and bias of an experiment. In law, "reliability" is describing a level of "trustworthiness, or worthy of confidence."[24] Neither is incorrect, but the inconsistent use of these terms can and does cause miscommunication.

Creating consistent terminology within a discipline and among multidisciplinary groups will not solve every misunderstanding between science and the law, but as the scientific community has discovered, "consistent definitions of concepts within their associated terms and symbols are essential if analysts and customers across the globe are to understand each other."[25]

There are a multitude of other examples of inconsistent terminology in all areas of forensic practice. The intent of this document is to set the stage for robust debate and empower the forensic community to rely on well-defined, consistent terminology that is ubiquitous and generally acceptable. This in turn can assist practitioners responsible for communicating this information to better express their findings and analyses to a nonscientific audience. Ultimately, this work should provide clarity and guidance for all users within the legal system, who in the end, share the responsibility of learning, understanding, and properly using these terms.

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[21] Dawn McQuiston-Surrett & Michael Saks, Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy and Impact, 59 *Hastings L.J.* 1159 2007-2008.

[22] The definitions at the time were "reasonable scientific certainty" means the "highest order of certainty; no reasonable probability of error." "Probable" means "more likely than not; most people could not leave such a mark." "Consistent (with)" meaning "similarity, but no degree of specificity, like match; may or may not be." "Match" is "some concordance, some similarity, but no expression of specificity intended; generally similar but true of a large percentage of the population." *Id.* at 1162, table 1.

[23] *Id.*

[24] *Black's Law Dictionary*.

[25] V J Barwick and E Prichard (Eds), *Eurachem Guide: Terminology in Analytical Measurement – Introduction to VIM 3*. (2011).