RESOLUTION:

RESOLVED, that the American Bar Association urges judges to consider the following factors in determining the admissibility of forensic science evidence and the manner in which it should be presented to the jury in criminal and delinquency proceedings:

1. Whether experts can identify and explain the theoretical and factual basis for any opinion given in their testimony and the reasoning upon which the opinion is based.

2. Whether experts use clear and consistent terminology in presenting their opinions.

3. Whether experts present their testimony in a manner that accurately and fairly conveys the significance of their conclusions, including any relevant limitations of the methodology used.

4. Whether experts explain the reliability of evidence and fairly address problems with the evidence including relevant evidence of laboratory error, contamination, or sample mishandling.

5. Whether expert testimony of individuality or uniqueness is based on valid scientific research.

6. Whether admissibility of expert testimony should be determined prior to trial.

7. Whether the court should prohibit the parties from tendering witnesses as experts and should refrain from declaring witnesses to be experts in the presence of the jury.

8. Whether to insist that attorneys in opening statements and closing argument accurately and fairly summarize the significance of an expert’s conclusions, including any relevant limitations of the methodology used.
The National Academy of Sciences (NAS) Report\(^1\) on forensic science, which was issued in 2009, raised numerous issues about the presentation of expert testimony at trial. These issues are significant. As the Supreme Court reminded us in *Daubert*: “Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it.”\(^2\)

Part of the problem undoubtedly rests with counsel. Attorneys sometimes pressure experts to “push the envelope”—not a surprising occurrence in the adversary system. ABA Standards provide: “A prosecutor who engages an expert for an opinion should respect the independence of the expert and should not seek to dictate the formation of the expert’s opinion on the subject. To the extent necessary, the prosecutor should explain to the expert his or her role in the trial as an impartial expert called to aid the fact finders . . . .”\(^3\) A comparable Standard applies to defense counsel.\(^4\)

1. **Basis and Reasoning for Expert Opinion**

This provision tracks the ABA Standards on DNA Evidence\(^5\) and extends it to other forensic disciplines.

2. **Clear and Consistent Terminology**

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\(^1\) NATIONAL RESEARCH COUNCIL, NATIONAL ACADEMY OF SCIENCES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009) [hereinafter NAS FORENSIC SCIENCE REPORT].


\(^3\) ABA STANDARDS FOR CRIMINAL JUSTICE, PROSECUTION FUNCTION AND DEFENSE FUNCTION, Standard 3-3.3(a) (3d ed. 1993). The commentary to this Standard states: “Statements made by physicians, psychiatrists, and other experts about their experiences as witnesses in criminal cases indicate the need for circumspection on the part of prosecutors who engage experts. Nothing should be done by the prosecutor to cast suspicion on the process of justice by suggesting that the expert color an opinion to favor the interests of the prosecutor.” *Id.*, cmt. at 59.

\(^4\) *Id.* Standard 4-4.4(a).

\(^5\) ABA STANDARDS FOR CRIMINAL JUSTICE, DNA EVIDENCE, Standard 16-5.3(a) (3d ed. 2007) [hereinafter DNA EVIDENCE].
The NAS Report on forensic science voiced concern about the use of terms such as “match,” “consistent with,” “identical,” “similar in all respects tested,” and “cannot be excluded as the source of.” These terms can have “a profound effect on how the trier of fact in a criminal or civil matter perceives and evaluates scientific evidence.” Such terms need to be defined and standardized, according to the Report. Moreover, ABA Resolution 100E(4) recommends: “the development and adoption of standards and common terminology for the clear communication of scientific testing results including, wherever possible, uniform report content within disciplines”.

3. Accurate and Fair Testimony; Limitations of Technique

This provision tracks the ABA Standards on DNA Evidence and extends it to other forensic disciplines. It also adds a phrase on the limitations of a technique. The NAS Report recommended that a technique’s limitations be acknowledged in both court testimony and laboratory reports.

Microscopic hair analysis illustrates the importance of this point. In *Williamson v. Reynolds*, a federal habeas corpus case, an expert testified at trial that hair samples were “consistent microscopically.” What does the term “microscopically indistinguishable” or “consistent with” mean? The probative value of this conclusion would, of course, vary if only a hundred people had microscopically indistinguishable hair as opposed to several million. As one hair examiner wrote: “If a pubic hair from the scene of a crime is found to be similar to those from a known source, [the courts] do not know whether the chances that it could have originated from another source are one in two or one in a billion.” In sum, the evidence may have little probative value, and yet the jury might not appreciate this fact.

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6 NAS FORENSIC SCIENCE REPORT, supra note 1, at 21.
7 DNA EVIDENCE, supra note 5, Standard 16-5.3(b).
8 Id. at 21-22.
9 Id.
11 See United States v. Frazier, 387 F.3d 1244, 1263 (11th Cir. 2004) (“[E]xpert testimony may be assigned talismanic significance in the eyes of lay jurors, and, therefore, the district courts must take care to weigh the value of such evidence against its potential to mislead or
This problem was exacerbated in *Williamson* because the expert 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 somewhere in the world that would have the same characteristics to their hair.” This is a gross overstatement. If it were true, hair evidence would be nearly on a par with nuclear DNA profiling. It is not. In final argument, the prosecutor proclaimed: “[T]here’s a match.” Even the state appellate court misunderstood the testimony, writing that the “hair evidence placed [petitioner] at the decedent’s apartment.” Moreover, one study found that the traditional adversary procedures—cross-examination, the presentation of opposing experts, and jury instructions—do not cure the problem.

Failure to clearly state the limitations of a technique can have serious consequences, as suggested by the role that microscopic hair analysis played in many of the wrongful conviction cases. A 1996 Department of Justice report discussing the exoneration of the first twenty-eight convicts through the use of DNA technology highlighted the significant role that hair analysis played in a number of these miscarriages of justice, including some death penalty cases. Two years later, a Canadian judicial inquiry into the wrongful conviction of Guy Paul Morin was released. His original conviction was based, in part, on hair evidence. The judge conducting the inquiry recommended that “[t]rial judges should undertake a more critical analysis of the admissibility of hair comparison evidence as circumstantial evidence of guilt.” A 2008 study of 200 DNA exoneration cases reported that hair testimony had been presented in forty-three of the original trials. A subsequent examination of 137 trial transcripts in exoneration cases concluded: “Sixty-five of the trials examined involved

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13 *Williamson*, 904 F. Supp. at 1554 (emphasis added).
14 *Id.* at 1557.
16 See Dawn McQuiston-Surrett & 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.”).
microscopic hair comparison analysis. Of those, 25—or 38%—had invalid hair comparison testimony. Most (18) of these cases involved invalid individualizing claims.\textsuperscript{20}

\textit{Overstatements}

The NAS Report also criticized exaggerated testimony such as claims of perfect accuracy, infallibility, or a zero error rate: “[I]mprecise or exaggerated expert testimony has sometimes contributed to the admission of erroneous or misleading evidence.”\textsuperscript{21}

\textit{“Zero Error Rate”}

For example, in \textit{United States v. Havvard},\textsuperscript{22} which involved a \textit{Daubert} challenge to fingerprint evidence, the expert claimed the “error rate for the method is zero.”\textsuperscript{23} Note the word \textit{method} in the above quote. Examiners argued that, while individual examiners may make mistakes, the methodology itself is perfect. However, the dichotomy between “methodological” and “human” error rates in this context is “practically meaningless”\textsuperscript{24} because the examiner is the method.\textsuperscript{25}

The NAS Report addressed this point: “Although there is limited information about the accuracy and reliability of friction ridge analyses, claims

\textsuperscript{21} NRC \textit{FORENSIC SCIENCE REPORT}, supra note 1, at 4.
\textsuperscript{22} 117 F. Supp. 2d 848 (S.D. Ind. 2000), aff’d, 260 F.3d 597 (7th Cir. 2001).
\textsuperscript{23} \textit{Id.} at 854.
\textsuperscript{24} \textit{See} Jennifer L. Mnookin, \textit{Fingerprint Evidence in an Age of DNA Profiling}, 67 BROOK. L. REV. 13, 60 (2001). Professor Mnookin goes on to provide this analogy: “The same argument could be made of eyewitness testimony, a notoriously unreliable form of evidence. People are all distinct from one another in observable ways; therefore the theoretical error rate of eyewitness identification is zero, though in practice observers may frequently makes errors.” \textit{Id.} \textit{See also} Simon A. Cole, \textit{More Than Zero: Accounting for Error in Latent Fingerprint Identification}, 95 J. CRIM. L. & CRIMINOLOGY 985, 1040 (2005) (“in fingerprint practice the concept is vacuous”). Professor Cole identified twenty-two misidentifications, which he argues “are most likely only the tip of the proverbial iceberg of actual cases of fingerprint misattribution.” \textit{Id.} at 991. The misidentification cases include some that involved (1) verification by one or more other examiners, (2) examiners certified by the International Association of Identification, (3) procedures using a sixteen-point standard, and (4) defense experts who corroborated misidentifications made by prosecution experts.
\textsuperscript{25} \textit{See} Sandy L. Zabell, \textit{Fingerprint Evidence}, 13 J.L. & POL.’Y 143, 172 (2005) (“But, given its unavoidable subjective component, in latent print examination people \textit{are} the process.”) (emphasis added).
that these analyses have zero error rates are not scientifically plausible.” The Report goes on to comment: “Some in the latent print community argue that the method itself, if followed correctly. . . has a zero error rate. Clearly, this assertion is unrealistic . . . . The method, and the performance of those who use it, are inextricably linked, and both involve multiple sources of error (e.g., errors in executing the process steps, as well as errors in human judgment.)”

Several courts have also commented on this issue. For example, in United States v. Mitchell, the Third Circuit commented: “Testimony at the Daubert hearing indicated that some latent fingerprint examiners insist that there is no error rate associated with their activities . . . . This would be out-of-place under Rule 702.” The same issue arose in a firearms identification case. In United States v. Glynn, the court wrote that “[t]he problem is compounded by the tendency of ballistics experts . . . to make assertions that their matches are certain beyond all doubt, that the error rate of their methodology is ‘zero,’ and other such pretensions.”

“Hundred Percent Accurate”

In a different firearms identification case, United States v. Monteiro, the court noted that:

the examiners testified to the effect that they could be 100 percent sure of a match. Because an examiner’s bottom line opinion as to an identification is largely a subjective one, there is no reliable statistical or scientific methodology which will currently permit the expert to testify that it is a “match” to an absolute certainty, or to an arbitrary degree of statistical certainty.

The NAS Report concurred: “The insistence by some forensic practitioners that their disciplines employ methodologies that have perfect accuracy and produce no errors has hampered efforts to evaluate the usefulness of the forensic science disciplines.”

26 NRC FORENSIC SCIENCE REPORT, supra note 1, at 142.
27 Id. at 143.
29 Id. at 245-46.
31 Id. at 574.
33 Id. at 372 (emphasis added).
34 NRC FORENSIC SCIENCE REPORT, supra note 1, at 47.
In 2000, Stephen Bunch, an FBI firearms identification expert, wrote:

[T]here is no rational or scientific ground for making claims of absolute certainty in any of the traditional identification sciences, which include fingerprint, document, firearms, toolmark, and shoe and tire-tread analysis. Case-specific conclusions of identity rest on a fundamental proposition, or hypothesis; namely, that no two fingerprints, bullets, etc., from different sources will appear sufficiently similar to induce a competent forensic examiner to posit a common source. But as any logician or philosopher of science would insist, no hypothesis can be proved absolutely.\(^{35}\)

In its first report on DNA profiling, the National Academy of Sciences report commented: “Prosecutors and defense counsel should not oversell DNA evidence. Presentations that suggest to a judge or jury that DNA typing is infallible are rarely justified and should be avoided.”\(^{36}\)

**“Scientific”**

The use of terms such as “science” or “scientific” in presenting expert testimony may also be problematic. In 1995, a federal district court in *United States v. Starzecpyzel*\(^{37}\) concluded that “forensic document examination, despite the existence of a certification program, professional journals and other trappings of science, cannot, after Daubert, be regarded as ‘scientific . . . knowledge.’”\(^{38}\) The court further stated that “while scientific principles may relate to aspects of handwriting analysis, they have little or nothing to do with the day-to-day tasks performed by [Forensic Document Examiners] . . . . [T]his attenuated relationship does not transform the FDE into a scientist.”\(^{39}\)

Although the court went on to admit the testimony as technical evidence, it placed conditions on its admissibility.\(^{40}\) Because FDEs use terms such as

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38. Id. at 1038.
39. Id. at 1041.
40. In the court’s view, Daubert did not apply to nonscientific experts. The court relied on the following statement in Daubert: “Our discussion is limited to the scientific context because that is the nature of the expertise offered here.” 509 U.S. at 590 n.8. This position was undercut by Kumho Tire, which held that all expert testimony must pass the Daubert reliability test. Kumho Tire Co., Ltd. V. Carmichael, 526 U.S. 137, 149 (1999).
“laboratory” and refer to authorities with titles containing the words “science” or “scientific,” there is a risk, according to the court, that jurors may bestow upon FDEs the aura of the infallibility of science. Consequently, these terms should not be used in the expert’s testimony. Moreover, the court approved a jury instruction, which stated that “FDEs offer practical, rather than scientific expertise.” Similarly, in United States v. Glynn, a firearms identification case, the court stated: “Based on the Daubert hearings this Court conducted . . . , the Court very quickly concluded that whatever else ballistics identification analysis could be called, it could not fairly be called ‘science.’”

The NAS Report provides some support for this position: “The law’s greatest dilemma in its heavy reliance on forensic evidence . . . concerns the question of whether—and to what extent—there is science in any given forensic science discipline.” A subsequent passage concludes: “Much forensic evidence—including, for example, bite marks and firearm and toolmark identifications—is introduced in criminal trials without any meaningful scientific validation, determination of error rates, or reliability testing to explain the limits of the discipline.”

Philosophers of science disagree about the definition of “science,” and the Supreme Court in Kumho Tire rejected the distinction between science and technical evidence for purposes of applying the Daubert test because such a distinction would be difficult to draw. Moreover, claiming the mantle of

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880 F. Supp. at 1049.


Id. at 570.

NAS FORENSICS SCIENCES REPORT, supra note 1, at 9.

Id. at 107-08.

The Supreme Court quoted one definition in Daubert: KARL POPPER, CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE 37 (5th ed. 1989) (“[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.”).

Daubert, 509 U.S. at 593.

The Court wrote:

[It] would prove difficult, if not impossible, for judges to administer evidentiary rules under which a gatekeeping obligation depended upon a distinction between “scientific” knowledge and “technical” or “other specialized” knowledge. There is no clear line that divides the one from the others. Disciplines such as engineering rest upon scientific knowledge. Pure scientific theory itself may depend for its development upon observation and properly engineered machinery. And conceptual efforts to distinguish the two are unlikely to produce clear legal lines capable of application in particular cases. Cf. Brief for National Academy of Engineering as Amicus Curiae 9 (scientist seeks to understand nature while the engineer seeks nature’s modification); Brief for Rubber Manufacturers Association as Amicus Curiae 14-16 (engineering, as an “‘applied science,’” relies on
“science” is a two-edged sword. It may impress the jury, but is also subjects the field to the rigors of the scientific method. The forensic identification disciplines are ultimately subjective, and there are often no meaningful standards — factors that undercut any claims that these techniques are “scientific.”

“Reasonable Scientific Certainty”

The expression “reasonable scientific certainty,” which is often included (and sometimes demanded) in expert testimony is another phrase that should be avoided. The phrase, which combines two suspect words— “scientific” and “certainty”—has no scientific meaning.

Although it is used frequently in cases, its legal meaning is ambiguous at best. Sometimes the phrase seems to be used as a confidence statement (i.e., “I am confident of my opinion.”), in which case the expert could avoid the term altogether and directly testify how confident she is in her opinion. In some

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“scientific reasoning and methodology”); Brief for John Allen et al. as Amici Curiae 6 (engineering relies upon “scientific knowledge and methods”).

*Kumho Tire*, 526 U.S. at 148.

In their amici brief in *Daubert*, the New England Journal of Medicine and other medical journals observed:

“Good science” is a commonly accepted term used to describe the scientific community’s system of quality control which protects the community and those who rely upon it from unsubstantiated scientific analysis. It mandates that each proposition undergo a rigorous trilogy of publication, replication and verification before it is relied upon.

Brief of the New England Journal of Medicine, Journal of the American Medical Association, and Annals of Internal Medicine as Amici Curiae in Support of Respondent at 2, Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579 (1993) (No. 92-102), 1993 WL 13006287, at *2. Peer review’s “role is to promote the publication of well-conceived articles so that the most important review, the consideration of the reported results by the scientific community, may occur after publication.” *Id.* at 3.

“Often there are no standard protocols governing forensic practice in a given discipline. And, even when protocols are in place . . . , they often are vague and not enforced in any meaningful way.” NAS FORENSICS SCIENCE REPORT, supra note 1, at 6.

The terms “reasonable medical certainty” and “reasonable ballistic certainty” are similarly problematic.

See James E. Hullverson, *Reasonable Degree of Medical Certainty: A Tort et a Travers, 31 St. Louis U.L.J. 577, 582 (1987) (“[T]here is nevertheless an undercurrent that the expert in federal court express some basis for both the confidence with which his conclusion is formed, and the probability that his conclusion is accurate.”); Edward J. Imwinkelried & Robert G. Scofield, *The Recognition of an Accused’s Constitutional Right to Introduce Expert Testimony*
cases, the phrase means something quite different. In *State v. Holt*, for instance, the expert testified, based on neutron activation analysis, that two hair samples were “similar and likely to be from the same source.” The Ohio Supreme Court ruled that expert testimony is admissible only if the opinion is based upon “reasonable scientific certainty.” For that court, reasonable scientific certainty meant that the expert had to testify that the hair sample *probably* came from the defendant and not that it *possibly* came from him.

*Holt* conflicts with the views other courts and scholars. Experts frequently testify that two samples “could have come from the same source” or “were likely to be from the same source.” Such testimony meets the relevancy standard of Federal Rule 401, and there is no requirement in the Federal Rules of Evidence that an expert’s opinion be expressed in terms of “probabilities.” Thus, in *United States v. Cyphers*, the expert testified that hair samples found on items used in a robbery “could have come” from the defendants. The defendants argued that the testimony was inadmissible because the expert did not express his opinion in terms of reasonable scientific certainty. The Seventh Circuit

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*Attacking the Weight of Prosecution Science Evidence: The Antidote for the Supreme Court’s Mistaken Assumption in California v. Trombetta*, 33 Ariz. L. Rev. 59, 69 (1991) (“Many courts continue to exclude opinions which fall short of expressing a probability or certainty. . . . These opinions have been excluded in jurisdictions which have adopted the Federal Rules of Evidence.”).

52 246 N.E.2d 365 (Ohio 1969).

53 Id. at 368.

54 The requirement that experts testify in terms of probability may have originated as a “sufficiency” rule in civil cases in which causation was an issue. It may then have been improperly converted into an “admissibility” rule in civil cases and then improperly transplanted into criminal cases. *See* PAUL C. GIANNELLI, BALDWIN’S OHIO PRACTICE, EVIDENCE § 702.6 (3d ed. 2010) (describing the Ohio experience with the term).

55 *See also* United States v. Longfellow, 406 F.2d 415, 416 (4th Cir. 1969) (expert’s opinion regarding paint comparison admissible even though expert did not make a positive identification); *State v. Boyer*, 406 So. 2d 143, 148 (La. 1981) (reasonable scientific certainty not required where expert testifies concerning the presence of gunshot residue based on neutron activation analysis).

56 553 F.2d 1064 (7th Cir. 1977).

57 Id. at 1072. *See also* United States v. Davis, 44 M.J. 13, 16 (C.A.A.F. 1996) (“Evidence was also admitted that appellant owned sneakers which ‘could have’ made these prints.”).
responded: “There is no such requirement.”

The ambiguity of the term is illustrated in *Burke v. Town of Walpole*, a bite mark identification case, in which the First Circuit had to interpret the term as used in an arrest warrant:

[W]e must assume that the magistrate who issued the arrest warrant assigned no more than the commonly accepted meaning among lawyers and judges to the term “reasonable degree of scientific certainty”—“a standard requiring a showing that the injury was more likely than not caused by a particular stimulus, based on the general consensus of recognized [scientific] thought.” Black’s Law Dictionary 1294 (8th ed. 2004) (defining “reasonable medical probability,” or “reasonable medical certainty,” as used in tort actions). That standard, of course, is fully consistent with the probable cause standard.

In sum, it seems doubtful that a jury would translate “scientific certainty” only as “more probable than not.” One scholar summed it up this way:

The reasonable-degree-of-scientific-certainty language almost certainly was drafted by the lawyers. Scientists have no use for this phrase (outside the courtroom). Indeed, “a reasonable degree of scientific certainty” is not a defined concept in scientific disciplines or even in law... It is legal mumbo jumbo derived from archaic cases in which lawyers discovered that if a medical doctor did not utter the incantation “to a reasonable degree of medical certainty,” his testimony might be excluded because doctors were not supposed to talk about mere probabilities. Modern cases usually recognize that suitably explained information about less-than-certain possibilities can be helpful in various circumstances, but experts want to (or are induced to) incant not only “medical certainty” but also “clinical certainty,” “psychological certainty,” “psychiatric certainty,” “engineering certainty,” “architectural certainty,” “ballistic certainty,” “professional certainty,” and even “forensic certainty” and

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58 553 F.2d at 1072. See also Boyer, 406 So. 2d at 148 (reasonable scientific certainty not required where expert testifies concerning the presence of gunshot residue based on neutron activation analysis).

59 405 F.3d 66 (1st Cir. 2005).

60 Id. at 91 (emphasis added).
"legal certainty."  

The phrase has come under attack in recent cases. In United States v. Glynn, the court ruled that the term “reasonable scientific certainty” could not be used in a firearms identification case. In light of the expert’s admission concerning the subjective nature of the examination, “the Government did not seriously contest the Court’s conclusions that ballistics lacked the rigor of science and that, whatever else it might be, its methodology was too subjective to permit opinions to be stated to ‘a reasonable degree of ballistic certainty.’”

In 2009, a district court in United States v. Taylor wrote: “[B]ecause of the limitations on the reliability of firearms identification evidence discussed above, Mr. Nichols will not be permitted to testify that his methodology allows him to reach this conclusion as a matter of scientific certainty. Mr. Nichols also will not be allowed to testify that he can conclude that there is a match to the exclusion, either practical or absolute, of all other guns. He may only testify that, in his opinion, the bullet came from the suspect rifle to within a reasonable degree of certainty in the firearms examination field.”

However, replacing the term “reasonable scientific certainty” with the term “reasonable ballistic certainty” does not solve the problem. This phrase suffers from the same defects.

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3 Id. at 571. In United States v. Willock, 696 F. Supp. 2d 536, 546 (D. Md. 2010), based on a comprehensive magistrate’s report, held that “Sgt. Ensor shall not opine that it is a ‘practical impossibility’ for a firearm to have fired the cartridges other than the common ‘unknown firearm’ to which Sgt. Ensor attributes the cartridges.” Thus, “Sgt. Ensor shall state his opinions and conclusions without any characterization as to the degree of certainty with which he holds them.” Id. at 549.

4 Id. at 1170 (D. N.M. 2009)

5 Id. at 1180.

6 In addition to the cases cited in the text, the following courts take this approach: Commonwealth v. Pytou Heang, 942 N.E.2d 927, 945 (Mass. 2011) (“Where a qualified expert has identified sufficient individual characteristic toolmarks reasonably to offer an opinion that a particular firearm fired a projectile or cartridge casing recovered as evidence, the expert may offer that opinion to a ‘reasonable degree of ballistic certainty.’”). See also United States v. Diaz, No. CR 05-00167 WHA, 2007 WL 485967, at *1 (N.D. Cal. Feb. 12, 2007) (“[T]he examiners who testify in this case may only testify that a match has been made to a ‘reasonable degree of certainty in the ballistics field.’”). United States v. Monteiro, 407 F. Supp. 2d 351, 372 (D. Mass. 2006).
4. **Lab Error, Contamination, and Mishandling**

This provision tracks the ABA Standards on DNA Evidence\(^{67}\) and extends it to other forensic disciplines.

5. **Claims of Uniqueness**

Claims of uniqueness must rest on empirically based research. In *Daubert*, the Supreme Court quoted philosopher Carl Hempel: “[T]he statements constituting a scientific explanation must be capable of empirical test.”\(^{68}\) For example, DNA evidence does not claim “uniqueness.” Although it is generally accepted that every person’s DNA is unique (except identical twins), current techniques, such as STRs, do not establish that uniqueness. Instead, a random match probability is presented.

Moreover, the precise claim must be examined. “Even if no two people had identical sets of fingerprints, this did not establish that no two people could have a single identical print, much less an identical part of a print.”\(^{69}\) Also, the examiner is comparing *impressions of fingerprints*, not friction ridges on fingers. Every time a fingerprint impression is left by the same person, it differs in some respects from other impressions left by that person. Further, crime scene prints are typically partial—and distorted due to pressure. Thus, because there frequently are “dissimilarities” between the crime scene and record prints, the examiner must decide whether there is a true dissimilarity, in which case there is an exclusion (“no match”), or whether the dissimilarity is due to distortion or an artifact, in case a “match” is permissible.\(^{70}\) The same issue arises in other forensic disciplines.

Courts have responded in different ways to claims of uniqueness. Due to a lack of foundational research, several courts have limited the scope of handwriting testimony, permitting expert testimony about the similarities and dissimilarities between exemplars but not the specific conclusion that the

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\(^{67}\) DNA EVIDENCE, *supra* note 5, Standard 16-5.3(d).

\(^{68}\) *Daubert*, 509 U.S. at 593. CARL HEMPEL, PHILOSOPHY OF NATURAL SCIENCE 49 (1966).

\(^{69}\) Mnookin, *supra* note 24, at 19.

\(^{70}\) Commonwealth v. Patterson, 840 N.E.2d 12, 17 (Mass. 2005) (“There is a rule of examination, the ‘one-discrepancy’ rule, that provides that a nonidentification finding should be made if a single discrepancy exists. However, the examiner has the discretion to ignore a possible discrepancy if he concludes, based on his experience and the application of various factors, that the discrepancy might have been caused by distortions of the fingerprint at the time it was made or at the time it was collected.”).
defendant was the author (“common authorship” opinion). Although the courts have used this approach most frequently in questioned document cases, they have sometimes applied it to other types of forensic expertise such as firearms examinations. One court took a less restrictive approach, ruling that the expert would be permitted to testify only that it was “more likely than not” that recovered bullets and cartridge cases came from a particular weapon.

“To the Exclusion of All Others”

Experts frequently testify that they have made a match “to the exclusion of all other firearms.” This is simply another way of claiming uniqueness. In United States v. Green, the court questioned such testimony: “O’Shea [the expert] declared that this match could be made ‘to the exclusion of every other firearm in the world.’ . . . That conclusion, needless to say, is extraordinary, particularly given O’Shea’s data and methods.” Further, in 2008, a year before the NAS report on forensic science was issued, a different NAS report, one on computerized ballistic imaging, addressed this issue. The report cautioned: “Conclusions drawn in firearms identification should not be made to imply the presence of a firm statistical basis when none has been demonstrated.” In particular, that report was concerned about testimony cast “in bold absolutes” such as that a match can be made to the exclusion of all other firearms in the world: “Such comments cloak an inherently subjective assessment of a match with an extreme probability statement that has no firm grounding and

See United States v. Oskowitz, 294 F. Supp. 2d 379, 384 (E.D.N.Y. 2003) (“Many other district courts have similarly permitted a handwriting expert to analyze a writing sample for the jury without permitting the expert to offer an opinion on the ultimate question of authorship.”); United States v. Rutherford, 104 F. Supp. 2d 1190, 1194 (D. Neb. 2000) (“[T]he Court concludes that FDE Rauscher’s testimony meets the requirements of Rule 702 to the extent that he limits his testimony to identifying and explaining the similarities and dissimilarities between the known exemplars and the questioned documents. FDE Rauscher is precluded from rendering any ultimate conclusions on authorship of the questioned documents and is similarly precluded from testifying to the degree of confidence or certainty on which his opinions are based.”); United States v. Hines, 55 F. Supp. 2d 62, 67 (D. Mass. 1999) (expert testimony concerning the general similarities and differences between a defendant’s handwriting exemplar and a stick up note was admissible but not the specific conclusion that the defendant was the author).


Id. at 107 (citations omitted).

NATIONAL RESEARCH COUNCIL, NATIONAL ACADEMY OF SCIENCES, BALLISTIC IMAGING 82 (2008).
unrealistically implies an error rate of zero.” Some courts are in accord.

Individualization. At present, it is easier to identify what an expert should not say than to prescribe what an expert may legitimately opine at trial. Indeed, some scholars have questioned whether individualization is even achievable. Other scholars do not accept this “radical skepticism” and believe that such an approach would mislead the jury in the other direction—by vitiating the probative value of the evidence. This position, however, does not endorse the overstatements described above. Nor does it minimize the risk of misleading the jury or give the expert carte blanche authority:

Let us assume that the jury gets the message—a match is not an absolute identification. Can the criminalist do something more to explain its probative value? Obviously, this depends on what is known about the frequency of the identifying trait in the relevant population. Are the features very common, rarely seen, or somewhere in between? There will be occasions when such qualitative testimony is reasonable. When no duplicates have been seen after systematic, careful and (one hopes) representative studies, a criminalist determined to refer to uniqueness might even assert that a trait is either unique or very rare in a population.

6. Motions in Limine

This provision tracks the ABA Standards on DNA Evidence and extends it to other forensic disciplines.

7. Declaration of Expertise

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78 Id.
79 See United States v. Alls, slip opinion, No. CR2-08-223(1) (S.D. Ohio Dec. 7, 2009) (“[T]his Court follows the approach taken by Glynn, Monteiro, Green, Diaz and Mouzone, and places a limitation on Ms. McClellan’s testimony. Although Ms. McClellan may testify as to her methodology, case work, and observations in regards to the casing comparison she performed for this case, she may not testify as to her opinion on whether the casings are attributable to a single firearm to the exclusion of all other firearms. Such testimony would be misleading and prejudicial given the inherent subjectivity in firearm and Toolmark Identification.”); Diaz, 2007 WL 485967, at *1.
82 Id. at 1180.
83 DNA EVIDENCE, supra note 5, Standard 16-5.1(d).
ABA Civil Trial Practice Standard 14 provides: “The court should not, in the presence of the jury, declare that a witness is qualified as an expert or to render an expert opinion, and counsel should not ask the court to do so.” 84 This ABA policy should be extended to criminal cases. As one court has noted,

Great care should be exercised by a trial judge when the determination has been made that the witness is an expert. If the jury is so informed such a conclusion obviously enhances the credibility of that witness in the eyes of the jury. All such ruling should be made outside the hearing of the jury and there should be no declaration that the witness is an expert. 85

In 1994, Judge Richey recommended this approach, noting that such a practice “ensures that trial courts do not inadvertently put their stamp of authority” on a witness’ opinion, and protects against the jury’s being “overwhelmed by the so-called ‘experts.’” 86

8. Argument of Counsel

In a number of cases, counsel in summation have overstated the content of the expert testimony. In People v. Linscott, 87 for example, “the prosecutor argued that hairs found in the victim’s apartment and on the victim’s body were in fact defendant’s hairs.” 88 Reversing, the Illinois Supreme Court wrote: “With these statements, the prosecutor improperly argued that the hairs removed from the victim’s apartment were conclusively identified as coming from defendant’s head and pubic region. There simply was no testimony at trial to support these statements. In fact, [the prosecution experts] and the defense hair expert . . . testified that no such identification was possible.” 89 DNA testing subsequently exculpated Linscott. 90

84 ABA CIVIL TRIAL PRACTICE STANDARD 14 (2007).
85 Luttrell v. Commonwealth, 952 S.W.2d 216, 218 (Ky. 1997). See also United States v. Laurienti, 611 F.3d 530, 547 (9th Cir. 2010) (“To the extent that Defendants argue that the district court abused its discretion by failing to describe Meyer as an ‘expert’ in front of the jury, we disagree. The determination that a witness is an expert is not an express imprimatur of special credence; rather, it is simply a decision that the witness may testify to matters concerning ‘scientific, technical, or other specialized knowledge.’ Fed.R.Evid. 702.”).
87 566 N.E.2d 1355 (Ill. 1991).
88 Id. at 1358.
89 Id. at 1359.
90 See CONNORS ET AL., supra note 17, at 65.
Similarly, in *Williamson v. Reynolds*, a federal habeas corpus case, an expert testified at trial that hair samples were “consistent microscopically.” This problem was exacerbated in *Williamson* because the expert 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 *somewhere in the world* that would have the same characteristics to their hair.” In final argument, the prosecutor proclaimed: “[T]here’s a match.” Even the state appellate court misunderstood the testimony, writing that the “hair evidence placed [petitioner] at the decedent’s apartment.”

In *United States v. Hebshie*, a recent arson case involving an accelerant-detecting dog (Billy), the court found the closing argument misleading. The “government’s closing argument . . . dramatically overstated Billy’s significance.” In its summary, the prosecutor “placed special emphasis on Billy the dog, implying that she had alerted to one space *to the exclusion of all the others*—which was not the case. Billy had not been shown ‘all other’ areas.” Defense counsel failed to object. For this and other lapses, the court found that counsel rendered ineffective assistance.

The DNA Standards note a different problem. Commentators have identified what is known as the “prosecution” and “defense” fallacies, both of which should be avoided. The prosecution fallacy occurs when people equate the probability of the evidence given guilt with the probability of guilt given the evidence. The defense attorney’s fallacy occurs when evidence is considered in isolation, rather than in totality.

For example, in DNA cases, analysts frequently testify about the statistical calculation of the “random match probability” (RMP) – the chance of a random match between the evidence sample and a person who is unrelated to the defendant (the “random” person). The RMP provides the following information:

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92 *Id.*
93 *Williamson*, 904 F. Supp. at 1554 (emphasis added).
94 *Id.* at 1557.
96 754 F. Supp. 2d 89 (2010).
97 *Hebshie*, 754 F. Supp. 2d at 95.
98 *Hebshie*, 754 F. Supp. 2d at 105.
If the defendant did not contribute the evidence DNA sample, the probability of a random person in the population having this same DNA profile is X. It is improper to equate this statistic as either the chance the defendant is guilty or innocent because it reverses the equation.