11-1-1997

Sharpening the Focus on Daubert's Distinction Between Scientific and Nonscientific Expert Testimony

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Sharpening the Focus on Daubert's Distinction Between Scientific and Nonscientific Expert Testimony*

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I. INTRODUCTION

Being a “jack-of-all-trades” in today’s world is not easy. Even the most ambitious students have no background in certain branches of knowledge. For instance, how many people know why vocal cord polyps may result from chronic irritation caused by fumes from hot-melt glue? How many can answer whether, in the case of loan participation agreements, it is the industry-wide standard to incorporate minority participant veto powers over loan forgiveness arrangements? How

2. Southland Sod Farms v. Stover Seed Co., 108 F.3d 1134, 1143 n.8 (9th Cir. 1997).
many can explain why heat may cause a plane engine damper to polymerize?\(^5\)

Whether the trier of fact be a judge or jury, the trier needs assistance from experts on how to answer these questions. Not surprisingly, given the growing complexity of the mechanics of society, expert witness testimony is becoming more and more prevalent in our courts.\(^6\) At the same time, commentators have become more aware of the strong impression experts have on juries.\(^7\) Juries have been accused of attributing a "mystic infallibility"\(^8\) and "aura of special reliability"\(^9\) to opinion evidence. Because experts are used so often and are vitally important to a jury’s fact-finding process, it should come as no surprise

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\(^5\) See Vadala v. Teledyne Indus., Inc., 44 F.3d 36 (1st Cir. 1995) (involving expert testimony on this subject).

\(^6\) See Charles R. Richey, Proposals to Eliminate the Prejudicial Effect of the Use of the Word "Expert" Under the Federal Rules of Evidence in Civil and Criminal Jury Trials, 154 F.R.D. 537, 540 (1994) (detailing the rise in expert testimony). As of September 1996, Technical Advisory Service for Attorneys, who advertise themselves as North America’s largest and most experienced referral service, had more than 24,000 experts under contract worldwide, encompassing 6000 disciplines. Technical Service for Attorneys, Brochure (on file with author). To get a further grasp of the prevalence of expert witnesses, observe the February 1998 issue of the American Bar Association Journal. Of the 187 classified advertisements in this issue, 140 were seeking opinion witness work involving 64 specialized fields. A.B.A. J., Feb. 1999, classified section. Although there have been few concrete reports on the likelihood that an expert will testify in any civil or criminal trial, a survey performed by Professor Samuel R. Gross of the University of Michigan School of Law is illustrative. See Samuel R. Gross, Expert Evidence, 1991 Wis. L. Rev. 1113, 1119. Of the 529 civil trials that led to jury verdicts in California State Superior Court in 1985 and 1986, experts testified at 86% of these trials. Id. While Professor Gross performed no similar survey on criminal trials, he relied on other sources to conclude that experts are used in a sizable minority of felony prosecutions. Id.

\(^7\) The strong influence experts have on juries was evidenced in a nationwide poll of jurors in civil and criminal cases conducted by the National Law Journal and LEXIS. Expert Witnesses Found Credible by Most Jurors, NAT’L L.J., Feb. 22, 1993, at S4. Experts appeared in 60% of the cases, and 89% of the jurors found the testimony of the experts to be very or somewhat believable. Id. A staggering 71% of the respondents claimed that the experts made a difference in the verdict. Id. According to the National Law Journal, the advice trial lawyers could glean from the poll was simple: If you have the resources, hire an expert. Id.

\(^8\) United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974).

\(^9\) Richey, supra note 6, at 541. To curb this aura of special reliability, Judge Richey has argued that the Advisory Committee to the Federal Rules of Evidence should delete any reference to “expert witness” in Article VII. Id. Judge Richey proposes that all such testimony be referred to as “opinion testimony” and that so-called experts should be referred to as “opinion witnesses.” Id.
that courts and commentators have begun to pay greater attention to the expert testimony that is admitted into trials.

Beginning primarily with the 1993 U.S. Supreme Court decision of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,10 law libraries around the country have been flooded with articles analyzing the standard for the admissibility of expert testimony. The flood points not only to the importance of this issue, but also to the inference that *Daubert* left many questions unanswered. Indeed, some commentators have argued that the few specific guidelines announced by the Court do not begin to cover the issues that judges who follow *Daubert* must consider.11

Much of what has been written about expert testimony in the federal court system has focused on scientific expert testimony, which was the type of testimony the Court was faced with in *Daubert*.12 Recently, however, some members of the legal community have turned their attention to nonscientific expert testimony, a topic not specifically addressed by the Court.13 One of the main questionssurfacing from this attention is whether courts should insist that nonscientific experts have a reliable14 basis for their opinions.15 If so, what standard should the courts use to determine reliability? If courts do have different

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11. E.g., Rochelle Cooper Dreyfuss, *Is Science a Special Case? The Admissibility of Scientific Evidence after Daubert* v. Merrell Dow, 73 TEX. L. REV. 1779, 1780 (1995). Dreyfuss discusses the Court’s failure to explain why science requires special treatment, as well as the Court’s failure to articulate a coherent vision of the role that science and scientists should play in adjudication.
12. See *Daubert*, 509 U.S. at 590 n.8 (limiting its holding to the scientific context).
14. The words “reliability” and “validity” will appear many times in this Comment, although not interchangeably. As *Daubert* explained, validity refers to the issue of whether a principle supports what it purports to show (is it in fact accurate), and reliability refers to whether the application of the principle produces consistent results. *Daubert*, 509 U.S. at 590 n.9. Put another way, reliability goes to the question of whether the witness can be believed, while validity goes to the question of whether what the witness believes is actually true. See Dreyfuss, *supra* note 11, at 1790 n.63.
standards for the admissibility of scientific and nonscientific testimony, what is it that makes testimony scientific?

A review of the circuit courts reveals that some circuits differ in their interpretation of Daubert’s application to nonscientific testimony.¹⁶ Some circuits have even been inconsistent in their own interpretation of Daubert’s application to nonscientific testimony.¹⁷ For those courts who have different admissibility standards for scientific and nonscientific testimony, it is important that they establish a standard for what it is that makes testimony “scientific.” Failure to accomplish this will lead to inconsistent outcomes and loss of public confidence in the judicial system. Courts seeking to differentiate the scientific from the nonscientific would be well served by focusing on Daubert’s discussion of the scientific method. From this discussion, a court could conclude that only opinion evidence derived from knowledge acquired through the scientific method is scientific.

Despite the variation in the circuits’ interpretations of Daubert, this Comment argues that, as a precondition to admissibility, district court judges should require that all expert testimony be derived from a reliable basis. This requirement should exist regardless of whether the expertise is of a scientific, technical, or in some other way specialized nature. Support for this requirement can be found in the text of Daubert, principles of evidence law, and public policy. The Comment then offers a model for what steps a federal court could take in determining the admissibility of any type of expert testimony under Rule 702 of the Federal Rules of Evidence. The model is entirely consistent with the language of Daubert. It breaks a court’s analysis down into Rule 702’s three primary requirements: that the expert be qualified, that testimony assist the trier of fact to understand or determine a fact in issue, and that the evidence be reliable.¹⁸ The reliability requirement is the most intricate of the three, primarily because Daubert’s standard for assessing reliability is ineffective when applied to nonscientific testimony. From an epistemological perspective, the Daubert standard fails to account

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¹⁶. See infra Part III.A.
¹⁷. See infra notes 82, 83, and 90.
¹⁸. See FED. R. EVID. 702.
¹⁹. Epistemology is the study of the method and grounds of knowledge, especially with reference to its limits and validity. WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 765 (1986).
for how a nonscientific expert acquires the knowledge underlying his opinions.

Because of *Daubert's* inadequacy in this regard, courts must demand that experts be specific in setting forth what bases they have for their opinions. By discerning the epistemological source of the experts' knowledge, courts will be better equipped to analyze the reliability of the experts' opinions. If the knowledge underlying an expert's opinions was derived from the scientific method, courts should apply a different reliability analysis than if the knowledge underlying an expert's opinions was derived from the more common experiences shaping daily life. With regard to all expert testimony, courts should not only consider the reliability of the underlying methodology upon which the opinions are based, but also how that methodology is executed in the case at hand, as well as the scope and viability of the expert's conclusions.20

The substance of an expert's testimony is often complex, or the expert would not have been needed in the first place. Judges are faced with a very difficult task in screening expert testimony from their courtrooms. The model proposed in this Comment is only a humble attempt to guide a court in its approach to a proffer of expert testimony. Admittedly, the model ignores many of the subtleties which might affect a court's judgment. Few proffers of expert testimony are suited for a checklist. The goal of the model, as well as the entire Comment, is to ease a court's task in determining the admissibility of expert testimony, not to complicate it.

II. *Frye*, Rule 702, and *Daubert*

It seems a matter of common sense that the only expert testimony society should want in its courtrooms is that which steers the factfinder towards reaching a more informed verdict. While scholars have long debated the goals of the legal system,21 almost all would agree that having the factfinder reach an informed verdict is among them. The


Federal Rules of Evidence actually purport to pursue an even loftier goal, stating that the rules should be construed to secure promotion of growth and development of the law of evidence to the end that the truth may be ascertained and proceedings justly determined.\textsuperscript{22} If an expert has no reasonable basis for his opinions, this shortcoming increases the possibility that the jury will deliver an uninformed verdict and that justice will not be served.\textsuperscript{23} No principle of fairness demands that the adversary system allow parties to spread untruths in a courtroom.\textsuperscript{24}

\textsuperscript{22} FED. R. EVID. 102.

\textsuperscript{23} See Richard D. Friedman, The Death and Transfiguration of Frye, 34 JURIMETRICS J. 133, 134 (1994). Friedman discusses what would happen if expert testimony is in fact worthless, or of far less value than the factfinder is likely to attribute to it. Id. In such a circumstance, "allowing the factfinder to hear and use the evidence may actually lead them further away from the truth." Id. at 135.

\textsuperscript{24} Some might argue that cross-examination should satisfactorily expose unreliable expert testimony and that courts need not play a vigilant screening role. See, e.g., Newell P.R., Ltd. v. Rubbermaid, Inc., 20 F.3d 15, 21 (1st Cir. 1994). According to the Newell Puerto Rico court, "[t]he fact that an expert's testimony may be tentative or even speculative does not mean that the testimony must be excluded so long as opposing counsel has an opportunity to attack the expert's credibility." Id. (quoting Int'l. Adhesive Coating Co. v. Bolton Emerson Int'l., Inc., 851 F.2d 540, 544 (1st Cir. 1988)). Daubert also makes a pitch for the importance of cross-examination. See Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 596 (1993). In response to the respondent's apprehension that abandonment of general acceptance would result in a "free-for-all" of irrational pseudoscientific assertions, the Daubert court claimed that vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible testimony. Id. Notwithstanding this dicta, one must remember that Daubert held that the reasoning or methodology underlying testimony of a scientific nature must be scientifically valid. Id. at 592-93. The Court's discussion of cross-examination in no way detracted from its emphasis on reliability.

The problem with relying on cross-examination to weed out unreliable expert testimony is that, under some circumstances, the tactic may not be successful. Even though the adversary system rests on the notion that competing attorneys will be roughly equivalent in quality and possess a similar level of resources to pursue litigation, this premise does not always hold true. For instance, the plaintiffs in a product liability case will, by-and-large, have fewer resources to devote to the case than a large corporate defendant will. See Cohen, supra note 13, at 53 (discussing same). Similarly, a criminal defendant often has fewer resources than the government. See Margaret A. Berger, Procedural Paradigms for Applying the Daubert Test, 78 MINN. L. REV. 1345, 1352-53 (1994). As a result, certain parties may be unable to hire their own comparably skilled expert, regardless of whether the facts are in their favor. Even if these parties can employ a comparably skilled expert, that expert may be financially constrained in terms of doing the research necessary for his testimony.

Another worry is that attorneys will be unable to expose the weakness in the opposing party's expert's opinions. Professional experts, whose income depends on their consistent effectiveness, know how to conduct themselves when under examination. As
Perhaps in recognition of the kind of argument made above, constraints on the admissibility of expert testimony are rooted in the traditions of American law. The standards for when to exclude expert testimony have differed over time and between jurisdictions. In federal court and in many states, the standard for most of this century with regard to scientific testimony was “general acceptance.” Under Frye v. United States, a decision by the Federal Court of Appeals for the District of Columbia, scientific evidence was admissible only if the principle upon which it was based was sufficiently established to have gained general acceptance in its field. Most courts following Frye refused to extend the same standard to nonscientific expert testimony.

Stephen Paris, President of the Defense Research Institute, has observed, “[T]his is not ‘Perry Mason.’ You never see an expert break down in tears and say, ‘You’re right. You’re right. I’m wrong.’ They are poised, articulate advocates.” Expert Witnesses Found Credible by Most Jurors, supra note 7, at 54 (quoting Mr. Paris).

This concern that cross-examination may at times be inadequate to expose the truth was also recently voiced by the Fifth Circuit. See Guillory v. Domtar Indus., Inc., 95 F.3d 1320, 1331 (5th Cir. 1996). In Guillory, the plaintiff, who was injured in a forklift accident, offered the expert testimony of Dr. Walter Reed, a mechanical engineer and accident reconstruction expert. Id. at 1329. Dr. Reed’s opinions rested in large part on a model he had created of the forklift involved in the accident. Id. at 1331. The court excluded Dr. Reed’s testimony on the ground that the model was unreliable. Id. According to the court, “[w]e are convinced that cross-examination of Dr. Reed could not salvage the truth .... The jury, frantically grasping at complex forklift and mining concepts, could easily miss subtle distinctions revealed on cross-examination and then drown in the untrue and the unproven.” Id.


26. See Imwinkelried, supra note 13, at 2272.

27. Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923). In Frye, the defendant was subjected to a systolic blood pressure deception test, which was a precursor to the modern polygraph or “lie detector” test. The defendant’s attorney offered as an expert the scientist who conducted the tests to testify as to the results. The district court sustained the prosecutor’s objection. In affirming the district court’s decision, the Federal Court of Appeals for the District of Columbia held that “the systolic blood-pressure deception test has not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made.” Id. The court further stated:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Id. (emphasis added). This passage became the primary authority for the “general acceptance” test.

28. See, e.g., United States v. Kilgus, 571 F.2d 508, 510 (9th Cir. 1978) (interpreting Frye to support this proposition).

29. See Imwinkelried, supra note 13, at 2280.
Instead, these courts adopted a laissez-faire attitude for when and under what criteria they would admit nonscientific testimony. 30

In 1975, Congress adopted the Federal Rules of Evidence, which included provisions specific to the admissibility of opinion testimony. Rule 702, which is at the focus of this Comment, reads, “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.” 31

In scanning this statute, one will discover that there is no mention of general acceptance. The Advisory Committee notes make no mention of it either.

Had Frye been eclipsed by the Federal Rules of Evidence? The Third Circuit tackled this question in the 1985 case of United States v. Downing, 32 and the opinion it delivered became a cornerstone for later treatment of scientific expert testimony by other circuits, as well as the U.S. Supreme Court. 33 In Downing, the Third Circuit was confronted with the issue of whether to admit the testimony of an expert in the field of human perception and memory concerning the reliability of eyewitness identifications. 34 While Downing recognized that the status of the Frye test under Rule 702 was somewhat uncertain, it rejected the test for reasons of “policy.” 35 After expounding on Frye’s flaws, Downing set

30. Id.
31. FED R. EVID. 702.
32. 753 F.2d 1224 (3rd Cir. 1985).
33. The Supreme Court in Daubert v. Merrell Dow Pharm., Inc. relied upon Downing for the proposition that all scientific expert testimony must be relevant. 509 U.S. 579, 591 (1993). The Court further cited Downing for the proposition that a reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within the community. Id. Daubert also stated in a footnote that its general discussion of reliability drew in part on Downing. Id. at 594 n.12.
34. Downing, 753 F.2d at 1226.
35. Id. at 1232. According to the court, the primary justification for the Frye test was that it provided a single method by which courts could assess the reliability of novel scientific expert testimony. Id. at 1235. No weighing of factors was involved. On the other hand, the court believed that the Frye test was too malleable to provide for orderly and uniform decision-making. Id. at 1237. Courts could too easily manipulate the relevant scientific community and the level of agreement needed for acceptance. Id. at 1236. Furthermore, the general acceptance standard reflected a conservative approach to the admissibility of scientific evidence which was at odds with the liberal spirit and language of the Federal Rules of Evidence. Id. at 1237. As the court pointed out, some
forth a flexible approach to the admissibility of scientific evidence that was consistent with the language of Rule 702.\textsuperscript{36} Downing stated that, in a district court judge's preliminary inquiry into the admissibility of scientific evidence, the judge must consider the evidence's reliability, potential for prejudice, and relevancy.\textsuperscript{37} The court then listed some of the factors bearing on reliability, one of which could be general acceptance.\textsuperscript{38}

With courts beginning to eschew \textit{Frye} and turn to Downing-like standards whose emphasis was on evidentiary reliability, or worse, turn to no standard at all, the discordance impelled commentators to take a closer look at how the legal system dealt with expert testimony. Many of these commentators expressed displeasure, some even going so far as to suggest that the state of expert testimony was an outright disgrace.\textsuperscript{39} One of the leading spokespeople for this position was Peter Huber, who expressed disgust at some courts' growing willingness to tolerate quackery on the witness stand and the peddling of "junk science."\textsuperscript{40} According to Huber, the legal establishment had adjusted the rules of scientific evidence may be able to assist the trier of fact even though the principles underlying the evidence had not become generally accepted in the field to which they belong. \textit{Id.} at 1235. The notion here seems to be that the \textit{Frye} test may exclude the expert testimony of a scientist with a brilliant, new theory, but whose theory had not yet received sufficient exposure in the scientific community to have gained general acceptance.


\textsuperscript{36} Downing, 753 F.2d at 1237.
\textsuperscript{37} \textit{Id.}
\textsuperscript{38} \textit{Id.} at 1238.
\textsuperscript{39} See Gross, supra note 6, at 1116. Gross offers this bleak thumbnail sketch of using expert information in American courts:

\begin{quote}
[T]he lawyers on each side of a dispute, acting in secret, choose people from an almost indefinitely large array and designate them as the witnesses; these witnesses are paid handsomely for their testimony; lawyers can preemptively hire witnesses in order to keep them from testifying when their honest testimony might help the other side; many witnesses make a business of testifying, and advertising their services; the attorneys control the information and the issues on which their experts testify; witnesses are allowed to testify to matters beyond their personal knowledge and to evaluate, as well as, [sic] to present information; the existing rules of pre-trial discovery are curtailed so that the identity and the evidence of many potential witnesses can be concealed from the opposing party; the usual rules of evidence are inapplicable at trial; and, finally, the subject matter of the testimony by these witnesses is intrinsically confusing, if not incomprehensible, to judges and jurors.
\end{quote}

\textit{Id.} at 1125.

\textsuperscript{40} Huber, supra note 25, at 3.
evidence so that "almost any self-styled scientist, no matter how strange or iconoclastic his views, will be welcome to testify in court. The same scientific questions are litigated again and again, in one courtroom after the next, so that error is almost inevitable."41

It was against this backdrop that on June 29, 1993, the U.S. Supreme Court decided the case of Daubert v. Merrell Dow Pharmaceuticals, Inc.42 In Daubert, the petitioners were two minor children who had been born with serious birth defects.43 The children and their parents sued respondent Merrell Dow, alleging that the birth defects had been caused by the mothers' ingestion of Bendectin, a prescription anti-nausea drug marketed by Merrell Dow.44 In proving causation, the petitioners relied on eight experts, each of whom had impressive credentials.45 These experts concluded that, based on a variety of methodologies, none of which had been generally accepted in their respective fields, Bendectin does cause birth defects in humans.46 In granting summary judgment to the respondent, the district court held that the petitioner's expert testimony was inadmissible because it failed the Frye test.47 The Ninth Circuit affirmed.48

Justice Blackmun, the author of the Supreme Court's majority opinion in Daubert, divided the opinion into two essential parts. The first part, supported by a unanimous court, held that the Frye test had been superseded by the Federal Rules of Evidence. Drawing upon much of the logic and authority utilized by the Downing court, Justice Blackmun concluded that having general acceptance as the exclusive test for admissibility was incompatible with the Federal Rules of Evidence.49

41. Id. As one of Huber's numerous and extraordinary examples of the "let-it-all-in" approach to expert testimony, Huber describes how one mother successfully attributed her son's cerebral palsy to trauma caused by her fall at work shortly before his birth. Id. at 77. In another case, a soothsayer with the backing of expert testimony from a doctor and several police department officials persuaded a Philadelphia jury that she had lost her psychic powers following a CAT scan. Id. at 4. The trial judge eventually threw out the jury's $1 million damage award. Id.
43. Id. at 582.
44. Id.
45. Id. at 583.
46. Id.
47. Id.
48. Id. at 584.
49. Id. at 589.
In the second part of the opinion, which Chief Justice Rehnquist and Justice Stevens declined to join, the Court began by interpreting Rule 702. According to Justice Blackmun, when a trial judge is faced with the proffer of expert testimony, he must determine at the outset whether the expert is proposing to testify to (1) "scientific knowledge" that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether the reasoning or methodology can properly be applied to the facts in issue.

The Court then proposed four factors, which it described as "general observations," that should be weighed in a flexible manner by the trial judge in determining whether a theory or technique is scientific knowledge that will assist the trier of fact. The first factor a trial judge should consider is whether the theory or technique can be or has been tested. Testing a hypothesis, claimed the Court, distinguishes science from other fields of human inquiry. The second factor to be considered is whether the theory or technique has been subjected to peer review and publication. While not a sine qua non of admissibility, peer review and publication increase the likelihood that substantive flaws in methodology will be detected. Third, in the case of a particular scientific technique, the trial judge should consider the known or potential rate of error, as well as the existence and maintenance of standards controlling the technique's operation. Logic suggests that a technique with a high rate of error or weak standards in controlling its operation will be less reliable. Finally, the trial judge should consider "general acceptance." Widespread acceptance of a technique or theory may recommend its admissibility, while minimal support may encourage a trial judge to view the technique or theory with skepticism.

The Court emphasized that the focus of the inquiry envisioned by Rule 702 must be solely on principles and methodology, not on the conclusions that they generate. In addition to Rule 702, a trial judge should be mindful of other applicable rules governing the admissibility of expert testimony.

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50. *Id.* at 590-91. The first requirement goes primarily to reliability and the second goes primarily to relevance. *Id.*
51. *Id.* at 592-93.
52. *Id.* at 593-94.
53. *Id.* at 593. The Court described testability as a "key question," perhaps suggesting that of the four factors, it was the most important. See *id.*
54. *Id.* at 593-94.
55. *Id.* at 594.
56. *Id.*
57. *Id.* at 594-95.
testimony. Among those noted by the Court were Rules 703, 706, and 403. Justice Blackmun closed his opinion by contrasting the quests for truth in the courtroom with the quests for truth in the laboratory. While scientific conclusions are subject to perpetual revision, law must resolve disputes finally and quickly.

III. Daubert’s Scope: The Debate

One of the immediate sources of disagreement resulting from Daubert, and an area that sparks just as much controversy today, is the opinion’s scope. Particularly, courts and commentators are divided as to whether the opinion was limited to scientific testimony or whether it was

58. Id. at 595.
59. Rule 703 provides that expert opinions may be based on otherwise inadmissible hearsay, but are to be admitted only if the facts or data upon which the opinions are based are of a type reasonably relied upon by experts in the particular field in forming opinions or inferences on the subject. Fed. R. Evid. 703. In the same way that Daubert gave Rule 703 short shrift in prescribing its impact on the admissibility of expert evidence, so will this Comment.
60. Rule 706 allows a trial judge to appoint an expert of his own choosing. Fed. R. Evid. 706. Having courts appoint independent experts is thought by some to be a way to overcome the “battle of the experts” which is now so common. See Christopher B. Mueller & Laird C. Kirkpatrick, Evidence Under the Rules: Text, Cases, and Problems 715 (3d ed. 1996). Nevertheless, court-appointed experts are a rarity in American practice. Id. A likely explanation for this rarity is that judges are reluctant to interfere in the parties’ presentation of evidence. Id. Such interference may strike a judge as counter to our country’s adversary tradition. Id.
61. Rule 403 permits the exclusion of relevant evidence if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury. Fed. R. Evid. 403. In Daubert, the Court, quoting Judge Jack Weinstein, explained, “Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under Rule 403 of the present rules exercises more control than over experts than over lay witnesses.” Daubert, 509 U.S. at 595 (quoting Jack B. Weinstein, Rule 702 of the Federal Rules of Evidence Is Sound: It Should Not Be Amended, 138 F.R.D. 631, 632 (1991)). Although courts do make use of Rule 403 to exclude expert testimony, the focal point of this Comment is Rule 702, which more frequently governs a court’s admissibility analysis.
63. Id. at 597.
64. See, e.g., Dreyfuss, supra note 11, at 1782 (“The question of scope was apparent even before the majority’s ink was dry.”).
also meant to encompass nonscientific testimony. If it was meant to encompass nonscientific testimony, to what extent?

A. The Four Broad Options Which Courts Tend to Embrace

Courts have essentially chosen between four broad options in identifying Daubert's scope. Under the first option, courts have decided that Daubert is completely inapplicable to nonscientific expert testimony, even for the simple proposition that Rule 702 regulates the subject and theories about which a nonscientific expert may testify. Under the second option, courts still do not extend Daubert's standard for admissibility to nonscientific testimony, although they do read Rule 702 as the governing rule for the subject and theories about which a nonscientific expert may testify. Courts adopting either the first or second option may not mention Daubert in their analysis, although it is fair to infer that all federal judges are familiar with Daubert and at least bear the case in mind whenever they are confronted with expert testimony. A third option is to cite Daubert for the proposition that nonscientific testimony must be reliable and relevant to the task at hand. The fourth major option is to extend Daubert not only to the proposition that nonscientific testimony must be reliable and relevant, but also that the testimony satisfy Daubert's test for reliability. This would require a court to consider whether the evidence is valid in light of the Daubert factors.

An example of a court choosing the first option, that Daubert is inapplicable to nonscientific testimony even for the proposition that Rule 702 regulates the subjects and theories about which a nonscientific expert may testify, is the Second Circuit case of Iacobelli Construction.

65. See, e.g., Richard Nahas, Comment, Daubert v. Merrell Dow Pharmaceuticals, Inc. Requiem for Frye: The Supreme Court Lays to Rest the Common Law Standard for Admitting Scientific Evidence in the Federal Courts, 29 NEW ENG. L. REV. 93, 126-27 (1994) (observing that if courts were to hold that Daubert's dicta was limited to the area of scientific evidence, they would have to address a series of related questions which Daubert offers no guidance in resolving). Chief Justice Rehnquist, in his partial dissent in Daubert, anticipated these interpretive problems. He asked, "Does all this dicta [in the second part of the Court's opinion] apply to an expert seeking to testify on the basis of 'technical or other specialized knowledge'—the other types of expert knowledge to which Rule 702 applies—or are the 'general observations' limited only to 'scientific knowledge'?" Daubert, 509 U.S. at 600 (Rehnquist, J., dissenting in part and concurring in part).

66. See infra Part IV.C for a discussion of what makes testimony "scientific" or "nonscientific."

67. See Daubert, 509 U.S. at 589 ("The primary locus of this obligation [to screen scientific evidence] is Rule 702, which clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify.

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Inc. v. County of Monroe. Iacobelli, a public contractor, brought suit against the county, the water district, and the project engineer as a result of their denial of Iacobelli's differing site conditions claim under a contract to construct a sewage tunnel. Relying on Daubert, the district court disregarded the affidavits of the plaintiff’s experts, whose testimony on the contract and construction results were derived from review of bid documents, geotechnical data, and geotechnical interpretive reports. The Second Circuit reversed, stating that the experts’
affidavits did not present the kind of "junk science" problem that Daubert was meant to address. 71 Because the experts relied upon the type of methodology and data typically used and accepted in construction litigation cases, the affidavits should have been admissible. 72 As is evident, the Iacobelli court did not base its admissibility analysis on the language of Rule 702. Instead, the court relied on a standard for admissibility that was more closely akin to Rule 703. 73

An example of a court choosing the second broad category, that under Daubert Rule 702 regulates the subject and theories about which a nonscientific expert may testify, is the Ninth Circuit case of Thomas v. Newton International Enterprises. 74 Thomas was a longshore worker who was injured when she fell through an unguarded, uncovered hatch opening. 75 Thomas filed a negligence action in California state court against the vessel owner, Newton International, which Newton subsequently removed to federal court. During the summary judgment hearing, Thomas sought to introduce the declaration of George Kuvakas, Jr., a longshoreman with twenty-nine years of experience. 76 After reviewing all of the subpoenaed documents from Newton and photographs of the accident site, Kuvakas declared that in his experience the presence of an unguarded, uncovered deck opening or manhole positioned within two feet of the bottom of an access ladder is an extremely unusual and hazardous condition. 77 The district court refused to consider Kuvakas's declaration, in part on the ground that an inadequate foundation was provided for his qualifications. Subsequently, the district court granted the defendant's motion for summary judgment. 78

The Ninth Circuit reversed, holding that Kuvakas was qualified to give expert testimony and that his testimony created a genuine issue of material fact sufficient to defeat a summary judgment motion. 79 According to the court, the issue of qualifications is governed by Rule 702, under which an expert may be qualified by either "knowledge, skill, experience, training, or education." 80 Based on Kuvakas's years of

71. Id. at 25.
72. Id.
73. See supra note 59 (discussing Rule 703 of the Federal Rules of Evidence).
74. 42 F.3d 1266 (9th Cir. 1994).
75. Id. at 1268.
76. Id. at 1269. In his declaration, Kuvakas declared that he had worked in every job category within the industry and for every stevedoring company. Id.
77. Id. Kuvakas also declared that this type of condition would not be something that even an experienced longshore worker would anticipate. Id.
78. Id.
79. Id. at 1269-70.
80. Id. at 1269 (quoting FED. R. EVID. 702).
longshore experience and the variety of work he had performed, the
court found that this at least lay the minimal foundation of knowledge,
skill, and experience required in order to satisfy Rule 702. \(^{81}\) In a
footnote, the court stated that "Daubert was clearly confined to the
evaluation of scientific expert testimony." \(^{82}\) The court performed no
inquiry into the reliability of Kuvakas’s opinions, nor did it attempt to
apply any of the Daubert factors. Overall, it appears that the court’s
admissibility test began and ended with a reading of Rule 702 that
required that a nonscientific expert be sufficiently qualified in the
pertinent field.

The third option, that application of the Daubert factors is unwarranted
with nonscientific testimony, but that Daubert still requires all expert
testimony to be reliable and relevant, is embraced by many courts. \(^{83}\)

\(^{81}\) Id. at 1269-70.

\(^{82}\) Id. at 1270 n.3. As is discussed infra Part IV.A, the Ninth Circuit has
struggled to find a consistent interpretation of Daubert in relation to nonscientific expert
testimony. Compare United States v. Cordoba, 104 F.3d 225, 230 (9th Cir. 1997)
("Daubert applies only to the admission of scientific testimony.") and McKendall v.
Crown Control Corp., 122 F.3d 803, 806 (9th Cir. 1997) ("Daubert is confined to the
evaluation of ‘scientific’ expert testimony."). with Southland Sod Farms v. Stover Seed
Co., 108 F.3d 1134, 1143 n.8 (9th Cir. 1997) ("Daubert’s holding applies to all expert
testimony.") and Claar v. Burlington N. R.R. Co., 29 F.3d 499, 501 n.2 (9th Cir. 1994)
(Daubert’s requirements “apply to all proffered testimony—not just testimony based on
novel scientific methods or evidence."). For now the McKendall court has the final
word on the matter.

\(^{83}\) The Fourth Circuit has recently followed this approach. See Freeman v. Case
Corp., 118 F.3d 1011, 1016-17 (4th Cir. 1997). In Freeman, plaintiff offered the expert
testimony of Smith Reed, an expert in mechanical engineering, to prove design defect.
Id. at 1016. The Fourth Circuit affirmed the district court’s decision to admit Reed’s
testimony, reasoning that in cases where an expert relies on his experience and training
and not a particular methodology to reach his conclusions, application of the Daubert
analysis is unwarranted. Id. at 1016 n.6. Although the court did not cite Daubert for
the proposition that all expert testimony must be reliable, the court did perform a
reliability analysis. See id at 1016-17.

Freeman purported to leave “open” whether Daubert applies outside the scientific
context, yet stated that Daubert did not apply where an expert relies on experience and
training to form his opinions. Id. at 1016 n.6. As discussed infra note 167, the Fourth
Circuit’s explanation as to why Daubert did not apply under the facts of Freeman
demonstrates the court’s difficulty in apprehending what makes testimony scientific or
nonscientific, as well as the significance of that distinction.

The Seventh Circuit adopted this third option in a 1993 case involving the expert
testimony of an accountant, although in doing so used some language one might expect
to encounter with a court adopting the fourth option. See Frymire-Brinati v. KPMG Peat
Marwick, 2 F.3d 183 (7th Cir. 1993). In Frymire-Brinati, a pair of investors sued Peat
Marwick for securities fraud, alleging that the accounting firm committed fraud in
An example of a court espousing this third option is the Tenth Circuit in *Compton v. Subaru of America, Inc.* An example of a court espousing this third option is the Tenth Circuit in *Compton v. Subaru of America, Inc.* 84 Compton brought suit against Subaru for design defect and sought to introduce the expert testimony of Larry Bihlmeyer, an aerospace and mechanical engineer. 85 In arriving at his conclusion that the accident vehicle was defectively designed, Bihlmeyer relied upon general engineering principles and his twenty-two years of experience in the industry. 86 In affirming the district court’s decision to admit Bihlmeyer’s testimony, the Tenth Circuit cited *Daubert* certifying financial statements upon which the investors had relied. *Id.* at 185-86. The plaintiffs’ expert, a manager of an accounting firm, testified that in conducting the audit of the financial statements, Peat Marwick did not state its accounts according to Generally Accepted Accounting Principles. *Id.* at 186. The expert, who relied in part on a controversial discounted cash flow analysis, conceded that he did not employ the methodology that experts in valuation find essential. *Id.*

The court held that the expert’s testimony should have been excluded, finding that under *Daubert* a trial judge must ensure that all expert testimony is reliable and relevant. *Id.* The court further cited *Daubert* for the proposition that the Federal Rules of Evidence require a judge to undertake a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid. *Id.* As is evident, *Frymire-Brinati* discussed *Daubert*’s standard of reliability—scientific validity—in the context of a nonscientific field of inquiry. Despite this, the court did not explicitly subject the expert’s testimony to the *Daubert* factors. Another example of a court adopting this third option is the Eighth Circuit case of *United States v. Johnson*, 28 F.3d 1487, 1496-97 (8th Cir. 1994). In *Johnson*, defendants were convicted of conspiring to distribute cocaine base (crack). *Id.* at 1492. The government offered the testimony of Keith Johnson, an unindicted coconspirator and member of the Crenshaw Mafia Bloods gang, who testified generally about the business of drug trafficking, the Bloods, gang membership, and the association between the defendants. *Id.* at 1496. Johnson had extensive experience in the business of drug trafficking, evidenced by six years of setting up drug distribution centers in different cities. *Id.* In upholding the district court’s decision to admit Johnson’s testimony, the Eighth Circuit cited *Daubert* for the proposition that an expert’s testimony must rest on a reliable foundation and be relevant to the task at hand. *Id.* at 1497. The court’s inquiry into reliability was apparently satisfied by Johnson’s experience in drug trafficking and his personal association with some of the defendants. See *id.* at 1496-97.

The Eighth Circuit seemed to abandon this third category, however, only two years after *Johnson* in *Peitzmeier v. Hennessy Indus., Inc.*, 97 F.3d 293, 296-98 (8th Cir. 1996). In *Peitzmeier*, the Eighth Circuit affirmed the district court’s exclusion of plaintiffs’ expert testimony regarding design defects in a tire-changing machine. *Id.* at 298. The court applied all four *Daubert* factors in its reliability inquiry, rejecting plaintiffs’ argument that *Daubert* is inapplicable to testimony founded on basic engineering principles. *Id.* at 297. Although the Eighth Circuit’s apparent inconsistent application of *Daubert* may rest in its indecision over what constitutes scientific testimony, the language of the case seems to suggest that the *Daubert* factors should be applied to all expert testimony. See *id.* at 296 (discussing *Daubert* in the context of expert testimony generally). Indeed, at least one other federal circuit court appears to have read *Peitzmeier* to this effect. See *Watkins v. Telsmith*, 121 F.3d 984, 990 (5th Cir. 1997).

84. 82 F.3d 1513 (10th Cir. 1996).
85. *Id.* at 1516.
86. *Id.* at 1519.
for the proposition that all expert testimony must be reliable and relevant, but went on to add that "[t]he language in Daubert makes clear the factors outlined by the Court are applicable only when a proffered expert relies on some principle or methodology. In other words, application of Daubert factors is unwarranted in cases where expert testimony is based solely upon experience and training." Compton concluded that because Bihlmeyer's testimony was not dependent on any particular methodology or technique, Daubert had little bearing.

An example of a court adhering to the fourth broad option, that nonscientific testimony must be valid in light of the Daubert factors, is the Sixth Circuit case of Berry v. City of Detroit. In Berry, the

87. Id.
88. Id. at 1518.
89. Id. at 1519.
90. 25 F.3d 1342 (6th Cir. 1994). The Sixth Circuit appears to have retreated from this fourth category, however. See United States v. Jones, 107 F.3d 1147, 1158 (6th Cir. 1997). In Jones, the Sixth Circuit held that the district court did not abuse its discretion in admitting the testimony of the government's expert witness, a forensic document analyst. Id. at 1161. The court declined to incorporate the Daubert factors in its admissibility analysis, reasoning, "If that framework were to be extended to outside the scientific realm, many types of relevant and reliable expert testimony—that derived substantially from practical experience—would be excluded." Id. at 1158.

Ironically, the Jones court referred to certain passages of Berry for general support for its new position regarding Daubert's application to nonscientific testimony. See id. Once one gets past the apparently inconsistent applications of Daubert, the Jones opinion provides an excellent analysis of the overlap of the admissibility inquiries regarding a nonscientific expert's qualifications and the reliability of his testimony. See id. at 1154-55, 1160; see also infra Part V.A (discussing this overlap). The Jones opinion also demonstrates how a court might analyze the reliability of a nonscientific expert's opinions by focusing on the quality and quantity of the experiences shaping his opinions. See Jones, 107 F.3d at 1160; see also infra Part V.C.2.b.iii.(a)-(b) (discussing this focus on the quality and quantity of a nonscientific expert's experiences).

A recent example of a court adhering to this fourth option, although with qualifications, is the Fifth Circuit in Watkins v. Telesmith, Inc., 121 F.3d 984, 988-91 (5th Cir. 1997). In support of her claim for design defect, Watkins offered the expert testimony of Marcus Dean Williams, who was to testify that the conveyor in question was unsafe and that alternative designs were feasible. Id. at 986. The Fifth Circuit affirmed the district court's exclusion of the testimony, holding that "the non-exclusive list of factors relevant under Daubert to assessing scientific methodology ... are also relevant to assessing other types of expert evidence. Whether the expert would opine on economic evaluation, advertising psychology, or engineering, application of the Daubert factors is germane ... ." Id. at 991 (footnotes omitted).

The court qualified its conception of Daubert's application to nonscientific testimony by stressing that Watkins involved an application of science to a concrete and practical
plaintiff brought suit under 42 U.S.C. § 1983 after his son was shot to death by a Detroit police officer.\textsuperscript{91} At trial, the plaintiff introduced the expert testimony of a former police sheriff, Frederick Postill, to establish that the police department’s failure to properly discipline their officers was the proximate cause of the shooting.\textsuperscript{92} Postill’s testimony rested in large part on his review of the police department’s past “shots fired” reports.\textsuperscript{93} The jury returned a verdict for the plaintiff in the amount of six million dollars.\textsuperscript{94}

The Sixth Circuit reversed, finding that Postill was not sufficiently qualified and that his testimony did not meet the requirements of \textit{Daubert}.\textsuperscript{95} The court stated that although \textit{Daubert} dealt with scientific experts, “its language relative to the ‘gatekeeper’ function of federal judges is applicable to all expert testimony offered under Rule 702.”\textsuperscript{96} Therefore, according to the court, the trial judge must ensure that any and all testimony or evidence admitted is not only relevant, but reliable.\textsuperscript{97} The Sixth Circuit performed its perceived gatekeeping function, in part, by applying three of the four \textit{Daubert} factors. The court found that (1) there was no indication of any testing of Postill’s discipline theory, (2) Postill’s theories had not been subjected to peer review, and (3) because there was no evidence that Postill’s theories

problem. \textit{See id.} at 990. The court found “not particularly relevant” the Ninth Circuit’s holding that the \textit{Daubert} factors are inapplicable to expert testimony based on specialized knowledge of criminal behavior patterns. \textit{Id.} at 989 n.5 (referencing \textit{United States v. Cordoba}, 104 F.3d 225, 230 (9th Cir. 1997) and \textit{United States v. Webb}, 115 F.3d 711, 716 (9th Cir. 1997)). Apparently \textit{Watkins} would adjust its reliability inquiry depending on the extent to which the expert testimony in question depended on principles of science.

As the \textit{Watkins} court conceded in a footnote, its interpretation of \textit{Daubert}’s application to nonscientific testimony had evolved somewhat from an earlier decision by that court. \textit{See id.} at 990 n.7 (discussing \textit{United States v. 14.38 Acres of Land, More or Less Situated in Leflore County, State of Mississippi}, 80 F.3d 1074 (5th Cir. 1996)). Some might argue, however, that the Fifth Circuit had done more of an “about face.” In \textit{14.38 Acres of Land}, an eminent domain action, the Fifth Circuit declined to incorporate the \textit{Daubert} factors in its admissibility analysis of the proposed testimony of both an engineering and a real estate appraisal expert. \textit{See 14.38 Acres of Land}, 80 F.3d at 1078. The court stated, “\textit{Daubert} expressly limited its discussion to the admissibility of scientific expert testimony.” \textit{Id.} at 1078 n.3. Considering \textit{Watkins}’s discussion of the Ninth Circuit line of cases involving expert testimony based on criminal behavior patterns, as well as its discussion of \textit{14.38 Acres of Land}, one could conclude that the Fifth Circuit is still groping for a consistent interpretation of \textit{Daubert}.

\begin{itemize}
  \item \textsuperscript{91} \textit{Berry}, 25 F.3d at 1344.
  \item \textsuperscript{92} \textit{Id.} at 1348.
  \item \textsuperscript{93} \textit{See id.} at 1352.
  \item \textsuperscript{94} \textit{Id.} at 1344.
  \item \textsuperscript{95} \textit{Id.} at 1349-56.
  \item \textsuperscript{96} \textit{Id.} at 1350.
  \item \textsuperscript{97} \textit{Id.}
\end{itemize}
were accepted by anyone other than himself, there was no evidence of
general acceptance.\textsuperscript{98} As is evident, the \textit{Berry} court believed that the \textit{Daubert} factors were an appropriate tool to use in determining the
reliability of nonscientific testimony.

\subsection*{B. What the \textit{Daubert} Opinion Itself Reveals as to its Scope}

To some extent, the \textit{Daubert} majority was clear as to the scope of the
opinion. In a footnote, the Court stated that, although Rule 702 applies
to technical and other specialized knowledge, its discussion was limited
to the “scientific context,” because that was the nature of the expertise
offered in the case.\textsuperscript{99} So, like its predecessor \textit{Frye}, \textit{Daubert} left unanswered what was to be the standard for the admissibility of
nonscientific evidence.\textsuperscript{100} Because there is no express reliability
requirement in Rule 702, lower courts are arguably free to admit
unreliable nonscientific testimony.\textsuperscript{101}

Although \textit{Daubert}, on its face, permits this freedom, the Court did
imply a reliability requirement. Recall that \textit{Daubert} grounded its
reliability inquiry in the phrase “scientific knowledge.”\textsuperscript{102} According
to the Court, “the word ‘knowledge’ connotes more than subjective
belief or unsupported speculation. The term ‘applies to any body of
known facts or to any body of ideas inferred from such facts or accepted
as truths on good grounds.’”\textsuperscript{103} One would expect that the Court
intended the word “knowledge” to carry the same meaning and weight
whether it be used in the context of scientific, technical, or other

\begin{footnotes}
\item[98.] \textit{Id.} at 1350-51.
\item[100.] \textit{See Frye v. United States}, 293 F. 1013, 1014 (D.C. Cir. 1923) (implicitly
limiting its discussion to scientific testimony).
\item[101.] \textit{See Imwinkelried, supra} note 13, at 2288 (expressing this concern).
\item[102.] \textit{Daubert}, 509 U.S. at 589-90.
\item[103.] \textit{Id.} at 590 (quoting \textsc{Webster’s} \textsc{Third New International Dictionary} 1252
(1986)).
\end{footnotes}
specialized knowledge.\textsuperscript{104} All expert testimony, \textit{Daubert} suggests, must rest on good grounds.

The Court also hinted at a reliability requirement for nonscientific testimony when it discussed the differences between the admissibility of opinion and lay testimony.\textsuperscript{105} The Court stated that unlike an ordinary witness,\textsuperscript{106} an expert is permitted wide latitude to offer opinions, including those not based on firsthand knowledge or observation.\textsuperscript{107} The Court continued, "Presumably, this relaxation of the usual requirement of firsthand knowledge . . . is premised on an assumption that the expert's opinions will have a reliable basis in the knowledge and experience of his discipline."\textsuperscript{108} This dicta indicates that the Court would require that a nonscientific expert's opinions have a reliable basis in the knowledge and experience of his discipline.

Beyond the language of \textit{Daubert}, one could infer a reliability requirement for nonscientific testimony from the overall tenor of the opinion. As one commentator has suggested, \textit{Daubert} reflects a continuing mistrust of juries "to sort out the wheat from the chaff."\textsuperscript{109} Evidently, the Court has concluded that judges are generally more equipped than jurors to determine what credence to lend to an expert’s

\textsuperscript{104} See Pomella v. Regency Coach Lines, Ltd., 899 F. Supp. 335 (E.D. Mich. 1995). In \textit{Pomella}, the plaintiff was injured in a traffic accident when the car in which she was a passenger was struck by a bus. \textit{Id.} at 337. The plaintiff’s experts relied upon estimates of the coefficient of friction in order to compute the time it would have taken the bus to come to a stop. \textit{Id.} at 340. In conducting its admissibility inquiry, the court stated that Rule 702 requires that an expert’s opinion relate to scientific knowledge. \textit{Id.} at 342. In a footnote, the court added:

Rule 702 likewise speaks to "technical and other specialized knowledge", [sic] but the Supreme Court in \textit{Daubert} focused on "scientific knowledge." Whether the coefficient of friction data falls under the former or the latter category, presumably the requirement of evidentiary reliability announced in \textit{Daubert} applies. \textit{As the word "knowledge" appears in both of the terms . . . it remains true that the expert's opinion must be based on "more than subjective belief or unsupported speculation", [sic] because this is the connotation of the word "knowledge."} \textit{Id.} at 342 n.7 (emphasis added) (citation omitted).

\textsuperscript{105} See \textit{Daubert}, 509 U.S. at 592.

\textsuperscript{106} See \textit{Fed. R. Evid.} 701. Under Rule 701, a lay witness's testimony in the form of opinions or inferences is limited to those opinions or inferences which are (a) rationally based on the perception of the witness, and (b) helpful to a clear understanding of the witness's testimony or the determination of a fact in issue. \textit{Id.}

\textsuperscript{107} \textit{Daubert}, 509 U.S. at 592. Under Rule 602, a lay witness may not testify to a matter unless evidence is introduced sufficient to support a finding that the witness has personal knowledge. \textit{Fed. R. Evid.} 602.

\textsuperscript{108} \textit{Daubert}, 509 U.S. at 592.

\textsuperscript{109} See Friedman, \textit{supra} note 23, at 144.
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This stands to reason. Judges are more educated than the average juror and more experienced in making courtroom credibility determinations. Furthermore, judges are able to ask experts questions directly, while juries generally rely on the attorneys to elicit information bearing on the experts' credibility.

C. Other Considerations for Requiring That all Expert Testimony Has a Reliable Foundation

Federal courts regularly exclude evidence that they suspect might be unreliable. Examples of this evidence include hearsay, unauthenticated documents, unoriginal writings, recordings and photographs, and lay witnesses who lack personal knowledge. Excluding such evidence is consistent with the Federal Rules of Evidence's aim to secure promotion of growth and development of the law of evidence to the end that the truth may be ascertained and the proceeding justly determined. Congress has apparently taken the stand that federal courts should not be opened up to unreliable evidence that has

110. Note that Justice Rehnquist, in his partial dissent, questioned the ability of judges to become "amateur scientists." Daubert, 509 U.S. at 600-01 (Rehnquist, J., dissenting in part and concurring in part). Some commentators have also raised this concern. See, e.g., Paul S. Miller et al., Daubert and the Need for Judicial Scientific Literacy, 77 JUDICATURE, Mar.-Apr. 1994, at 254, 254 (probing judges' ability "to understand at least the rudiments of statistics and probability theory . . . [and] obtain some appreciation of error factors and the implicit limitations on often-used means of scientific observation, measurement, and detection."). If Daubert was willing to invest judges with a gatekeeping role for scientific testimony, which in some cases may actually be as confusing to judges as to juries, the Court would probably have less misgivings investing judges with a gatekeeping role for nonscientific testimony. Nonscientific testimony is by its nature less complex than scientific testimony, and trial judges would have less difficulty assessing its reliability.

111. See FED. R. EVID. 801; FED. R. EVID. 802.
112. See FED. R. EVID. 901.
113. See FED. R. EVID. 1001; FED. R. EVID. 1002.
114. See FED. R. EVID. 602.
115. See FED. R. EVID. 102.
the great potential to mislead the factfinder. 116 Daubert seconded this philosophy on behalf of the judiciary.

Unreliable nonscientific expert testimony should be no exception. Granted, the impetus for Daubert may have been attributable to a perception that “junk science” had taken over courtrooms. 117 Some have argued, however, that if anything, there is less assurance of the accuracy and truthfulness of nonscientific testimony than there is of scientific testimony. 118 If the opponent of scientific testimony doubts the results of the proponent’s research, the opponent can in most cases replicate the research to discredit the results. 119 The very possibility that the opponent will take this action creates a disincentive for untruthful scientific testimony. 120 For the most part, however, such cross-party checks on the accuracy of nonscientific testimony are impossible. 121 Thus, the proponent of untruthful nonscientific testimony will have less worry that the deficiencies of his testimony will be revealed.

A court’s admitting unreliable expert testimony of any kind is particularly troublesome in criminal cases, where the central objective of the litigation is always the accurate determination of a defendant’s guilt. 122 A criminal defendant may be more handicapped in challenging expert testimony against him than a civil litigant because of fewer discovery rights and fewer resources. 123 Furthermore, as noted earlier,


117. See supra notes 40-41 and accompanying text. In fact, some have even pointed to the Bendectin litigation involved in Daubert as an area of junk science. See Joseph Sanders, Scientific Validity, Admissibility, and Mass Torts after Daubert, 78 MINN. L. REV. 1387, 1441 (1994).

118. See Imwinkelried, supra note 13, at 2279.

119. See id. at 2279-80.

120. See id. at 2280.

121. See id.

122. Berger, supra note 24, at 1352. Nonscientific experts do appear with some frequency at criminal trials. During the Chicago Jury Project conducted in the 1960s, researchers attempted to determine the types of expert witnesses called at criminal trials. Imwinkelried, supra note 13, at 2279. Most of the prosecution witnesses testified on scientific matters. See id. Of the witnesses, 43% were physicians, 22% were experts in chemical analysis, 19% were handwriting examiners, and 5% were authorities on intoxication testing. Id. However, 11% were technical experts on accounting and appraisal and 6% were police officers or F.B.I. agents. Id.

studies have shown that jurors in criminal cases find experts both credible and influential in the verdict. Because the Federal Rules of Evidence were meant to apply to civil and criminal cases equally unless otherwise indicated, the special concerns a court may have with regard to criminal cases should shape its interpretation of Rule 702 and its standard for the admissibility of nonscientific expert testimony.

IV. THE CONSEQUENCES OF DAUBERT'S DISTINCTION BETWEEN THE SCIENTIFIC AND THE NONSCIENTIFIC

A. Scientific Testimony vs. "Scientific Knowledge"

Whether or not the drafters of Rule 702 meant for "scientific knowledge" to be parsed from "technical, or other specialized knowledge," Daubert did so. The consequence of this is to permit courts to apply different standards of admissibility for scientific and nonscientific testimony. If courts do apply different standards, the very first question such courts should ask upon every proffer of expert testimony is whether the testimony is of a scientific or nonscientific nature. Only after a court identifies the nature of the testimony can it then begin to apply the appropriate standard. The very admissibility of the testimony might depend on which standard applies, especially if a court's standard for nonscientific testimony departs substantially from its standard for scientific testimony.

124. See supra note 7 and accompanying text (describing a National Law Journal/LEXIS poll in which 95% of criminal jurors who heard experts reported that the testimony was very believable or somewhat believable).

125. FED. R. EVID. 1101(b).

126. See Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 589-90 (1993). In his partial dissent, Justice Rehnquist asked, "[D]oes Rule 702 actually contemplate that the phrase 'scientific, technical, or other specialized knowledge' be broken down into numerous subspecies of expertise, or did its authors simply pick general descriptive language covering the sort of expert testimony which courts have customarily received?" Id. at 600 (Rehnquist, J., dissenting in part and concurring in part).

127. For instance, consider a court that applies "general acceptance" as its exclusive test for reliability in the field of design engineering. See Officer v. Teledyne Republic/Sprague, 870 F. Supp. 408, 410 (D. Mass. 1994). In Officer, a case arising out of an industrial accident, Officer alleged that Teledyne's valve was negligently designed in that its flexible settings involved erroneous adjustments. Id. at 409. In its motion for summary judgment, Teledyne challenged the testimony of Officer's expert, Darry Holt, in part on the ground that Holt's opinions were not supported by field tests or other empirical data and thus did not satisfy Daubert. Id. at 410. The court rebuffed this
Even with this need for certain courts to categorize their testimony at the outset, few actually do so, and the result has caused some confusion. For instance, recall the Ninth Circuit case of *Thomas v. Newton International Enterprises*, wherein the plaintiff’s expert, an experienced longshoreman named Kuvakas, opined that the presence of an unguarded, uncovered deck opening or manhole positioned within two feet of the bottom of an access ladder is an extremely unusual and hazardous condition. The Ninth Circuit ruled that, based on Kuvakas’s longshore experience, his testimony should have been admitted. Clearly, this test for admissibility departed substantially from *Daubert*.

An interesting aspect of *Thomas* appeared in a footnote, where the court responded to a contention raised by Newton’s counsel at oral argument. There, Newton’s counsel contended that under *Claar v. Burlington Northern Railroad Co.*, the district court had not abused its discretion in excluding Kuvakas’s testimony. *Claar* involved expert testimony of a clearly scientific nature—the causal connection between the plaintiffs’ workplace chemical exposure and their injuries. Yet, nowhere did *Claar* explicitly identify the testimony as being scientific in nature. Instead, the court proceeded directly to its reliability analysis, stating that “the district court was affirmatively required to find that the experts’ conclusions were based

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128. 42 F.3d 1266 (9th Cir. 1994) (discussed supra notes 74-82 and accompanying text).
129.  Id. at 1269.
130.  Id. at 1269-70.
131.  See id. at 1270 n.3.
132.  29 F.3d 499 (9th Cir. 1994).
133.  *Thomas*, 42 F.3d at 1270 n.3.
134.  *Claar*, 29 F.3d at 500. In *Claar*, the plaintiffs were a group of 27 people who brought suit against Burlington Northern, alleging that they had suffered from a variety of ailments stemming from their exposure to an assortment of chemicals while working at one of Burlington Northern’s shops. *Id.* Responding to a court order, the plaintiffs submitted the affidavits of two physicians who would testify on the issue of causation. *Id.*
on scientific knowledge.”^135 Taken literally and in isolation, this passage could be read to mean that all expert testimony, regardless of its subject matter, must be “scientific knowledge” in order to be admitted.

Presumably, this was the hook that Newton sunk its teeth into at oral argument—*Claar* demands that all expert testimony be based on scientific knowledge, and Kuvakas’s testimony was not based on scientific knowledge. This was a perfectly reasonable argument in light of the plain language of *Claar* and a string of other cases wherein the Ninth Circuit had failed to identify at the outset whether the testimony was of a scientific or nonscientific nature before applying *Daubert*’s standard of reliability.^136 Thomas responded to Newton’s argument by stating that “*Daubert* was clearly confined to the evaluation of scientific expert testimony. . . . While a scientific conclusion must be linked in some fashion to the scientific method, . . . Kuvakas’ nonscientific testimony need only be linked to some body of specialized knowledge or skills.”^137 Any trial judge reading *Thomas* ought to have taken away the lesson that he should always identify whether expert testimony is of a scientific or nonscientific nature before beginning his admissibility analysis. Only expert testimony derived in some fashion from the scientific method need qualify as “scientific knowledge.” It is a flat overstatement to say, as the Ninth Circuit did in *Claar*, that district courts are affirmatively required to find that experts’ conclusions are based on scientific knowledge.

The *Claar-Thomas* phenomenon stemmed from certain ambiguities in *Daubert*.^138 In *Daubert*, because the Court was faced with expert testimony that was so clearly of a scientific nature, it began its

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135. Id. at 502.
136. See, e.g., United States v. Rincon, 28 F.3d 921, 923 (9th Cir. 1994). In *Rincon*, which involved the expert testimony of a psychologist on eyewitness identification, the court stated:

> The Court [in *Daubert*] established a two-part test for determining whether to admit expert testimony: “[T]he trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue.”

*Id.* (quoting *Daubert* v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592 (1993)). For clarity’s sake and to avoid future arguments like those made by Newton’s counsel in *Thomas*, the court should have stated that *Daubert* established a two-part test for determining whether to admit scientific expert testimony, not all expert testimony.

137. *Thomas*, 42 F.3d at 1270 n.3.
admissibility analysis without having to explain why the testimony would have to meet the reliability requirements of scientific testimony. So, as a case upon which lower courts could model their admissibility analysis, Daubert is insufficient. It does not provide an illustration for how a court, which has differing admissibility standards for scientific and nonscientific testimony, must settle the question of whether the testimony is scientific before it can perform its admissibility analysis.

Daubert also unintentionally created a hitch in district courts' admissibility analysis when it tied its reliability requirement into the term “scientific knowledge,” rather than the “assist the trier of fact” portion of Rule 702 or somewhere else. As a result, when the Court referred to scientific knowledge, it was referring to “a standard of evidentiary reliability,” not a standard for establishing the epistemological foundation of an expert’s opinions. So, Daubert allowed courts to differentiate between testimony on scientific and nonscientific branches of knowledge, but it stripped from Rule 702 the very language which might be used in making this differentiation.

To illustrate, consider this passage in Daubert: “Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset . . . whether the expert is proposing to testify to . . . scientific knowledge.” The sentence seems to say that if an expert is testifying on a scientific subject, the trial judge must determine at the outset if the expert is proposing to offer reliable testimony. That is ridiculous, because what expert would not advertise his testimony as reliable? A more plausible reading is that the first step a court must take upon a proffer of expert testimony is to determine if the testimony is scientific knowledge. This is problematic as well. If the testimony is not scientific knowledge, meaning that its methodology is not based on scientifically valid principles, presumably it should be excluded. This is precisely the Claar-Thomas phenomenon. If courts always work backwards like this—determining if testimony is scientific knowledge before deciding which standard of admissibility applies—all nonscientific testimony would be excluded because not based on scientifically valid methodologies. The solution to the Claar-Thomas phenomenon is for courts that have differing admissibility standards for scientific and nonscientific testimony to always clarify the nature of the testimony before beginning their admissibility analysis.

139. See id. at 590; Fed. R. Evid. 702.
140. Daubert, 509 U.S. at 592.
141. The model offered by this Comment recommends a reliability requirement for all expert testimony, although the proposed standard for how to determine reliability is, in some respects, different for scientific and nonscientific testimony. See infra Part
B. A Court’s Failure to Articulate a Standard for Distinguishing the Scientific from the Nonscientific

Courts which have differing standards for the admissibility of scientific and nonscientific testimony must also develop a standard for determining what makes testimony scientific or not. Without such a standard, courts will be able to manipulate the evidence’s admissibility simply by giving it an arbitrary classification.

The ramifications of a court’s failure to articulate some standard for what is scientific is illustrated in two post-Daubert cases decided by the First Circuit: United States v. Alzanki\(^{143}\) and United States v. Brien.\(^{144}\) In Alzanki, a husband and wife were accused of keeping their maid, a Sri Lankan national, in a state of involuntary servitude by means of physical abuse and threats.\(^{145}\) The defendants argued that the maid often ventured outside their locked apartment during her alleged involuntary servitude, and given the normal human instinct for self-preservation, one would expect an unrestrained person threatened with such alleged physical abuse to flee her abusers at the first opportunity.\(^{146}\) The government countered by offering the testimony of Ann Burgess, a “victimologist,” who testified that abuse victims often harbor the opposite impulse—overwhelmed by fear they remain with their abusers.\(^{147}\) On appeal, the defendants contested their unsuccessful motion in limine to preclude this testimony.\(^{148}\)
The Alzanki court described Ms. Burgess’s testimony as “somewhat technical.” According to the court, the gatekeeping function contemplated by Rule 702 essentially requires the trial judge to assess whether it is “reasonably likely that the expert possesses specialized knowledge which will assist the trier better to understand a fact in issue.” Nowhere did the court analyze the scientific validity of Ms. Burgess’s opinions or mention the Daubert factors. Although the court did discuss her training and experience, it did not scrutinize the actual methodologies upon which her opinions were based.

Some might question the court’s determination that Ms. Burgess’s testimony was nonscientific. After all, victimology involves the study of human behavior, and as such would fall within the field of psychology. Psychology is a branch of knowledge that many regard as scientific. Perhaps the court believed that “not very complex scientific testimony” should be scaled down to the classification “somewhat technical.”

The First Circuit’s conclusion that Ms. Burgess’s testimony was nonscientific is particularly suspect after United States v. Brien. In Brien, the defendant was on trial for bank robbery. The prosecution intended to introduce several witnesses who could identify the defendant as the perpetrator of the robbery. In response, the defense offered the expert testimony of Alexander Yarmey, a professor of psychology and an expert on the weakness of eyewitness identification. Professor Yarmey was prepared to testify to the various factors that could undermine a witness’s observation, retention, and retrieval. The trial judge denied the defense’s first two motions to introduce Professor Yarmey’s testimony, denying the second because the proffer was too general and did not satisfy the foundational requirements under Daubert. Professor Yarmey eventually filed an eight-page affidavit, most of which was comprised of general statements regarding the

149. Id. at 1006.
150. Id. at 1005 (quoting United States v. Sepulveda, 15 F.3d 1161, 1183 (1st Cir. 1993)).
151. See id. at 1006.
152. For instance, Webster’s defines psychology as “the science of the mind or of mental phenomena and activities.” WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 1833 (1986) (emphasis added).
153. 59 F.3d 274 (1st Cir. 1995).
154. Id. at 275.
155. Id.
156. Id. at 275-76.
157. Id. at 276.
158. Id.
sources that create or compound error in eyewitness identifications.\textsuperscript{159} Neither the affidavit nor the submission by the defense purported to set forth in detail the scientific foundations for any of Professor Yarmey’s conclusions.\textsuperscript{160} The trial judge excluded the testimony, expressing a variety of concerns about the basis for Professor Yarmey’s assumptions, as well as “the fit and usefulness and misleading qualities” of the testimony.\textsuperscript{161}

Without adopting a blanket rule that qualified expert testimony on eyewitness identifications must routinely be excluded, the First Circuit affirmed the district court’s ruling on the ground that the defense failed to provide the district court judge with data or literature underlying the expert’s opinions.\textsuperscript{162} According to the court, “this procedure was justified both in order to determine reliability under \textit{Daubert} and to allow the judge to gauge whether the testimony would be helpful to the jury or would confuse or mislead instead.”\textsuperscript{163} The court pointed to \textit{Daubert}’s reliability requirement in other portions of its analysis as well.\textsuperscript{164} While not affirmatively identifying the testimony as scientific, nowhere did the court mention the terms “specialized” or “technical knowledge.” One cannot help but notice the court’s reluctance to tread near the issue of what type of knowledge was involved.

Considering the position the court was in, this trepidation was warranted. Because Professor Yarmey did not even go to the trouble to provide the information underlying his opinions, the court surely wanted to affirm the district court’s ruling and exclude the testimony. However, this would amount to excluding the testimony on the basis of reliability, a basis that \textit{Alzanki} had not incorporated into its admissibility analysis. To get around \textit{Alzanki} and other close-call cases in which the court had

\begin{itemize}
  \item \textsuperscript{159} Id.
  \item \textsuperscript{160} Id.
  \item \textsuperscript{161} Id. (quoting the trial judge).
  \item \textsuperscript{162} Id. at 277.
  \item \textsuperscript{163} Id.
  \item \textsuperscript{164} See id. at 277-78 (“\textit{Daubert, as well as common prudence, entitled the judge to require such underlying information . . . .}”). In \textit{Brien}’s discussion of other circuits who had encountered proffers of expert testimony on eyewitness identification, \textit{Brien} cited a Ninth Circuit case in which the Ninth Circuit had analyzed the testimony’s admissibility under \textit{Daubert}, utilizing the \textit{Daubert} factors to assess scientific validity. \textit{See id.} at 277; United States v. Rincon, 28 F.3d 921, 923-24 (9th Cir. 1994). Quite clearly, the \textit{Brien} court knew that there would be a great disparity between its analysis and other circuits’ if it were not to insist on some showing of reliability for Professor Yarmey’s opinions.
\end{itemize}
not read a reliability requirement into borderline nonscientific testimony, the Brien court refrained from identifying the testimony as either scientific or nonscientific. The court did this in spite of the fact that the experts in both Alzanki and Brien were testifying on matters rooted in psychology.

The Alzanki-Brien phenomenon is a consequence of a court having different standards of admissibility for scientific and nonscientific testimony but not having a standard for distinguishing between the two types of testimony. By neglecting to classify the testimony or by simply labeling it in an arbitrary fashion, the court can manipulate what testimony gets admitted. This result can only undermine the public’s confidence in the rule permitting opinion testimony, mobilizing agreement around Judge Learned Hand’s belief that “[n]o rule is subject to greater abuse . . . .”

C. How a Court Might Distinguish the Scientific from the Nonscientific

Courts with differing standards for the admissibility of scientific and nonscientific testimony must necessarily arrive at some standard for determining what qualities make an opinion scientific. Granted, this is a daunting task which would put many scientists at a loss for words.

165. See, e.g., United States v. Shay, 57 F.3d 126 (1st Cir. 1995). In Shay, the court excluded the testimony of an expert psychiatrist who offered to testify that the defendant suffered from a mental disorder that caused him to make grandiose statements against self-interest. Id. at 133. The court identified the psychiatrist’s testimony as “specialized” and did not apply Daubert’s reliability requirement. Id.

As with Alzanki, people might criticize Shay’s decision not to label this testimony as scientific and apply Daubert’s standard of reliability. According to Webster’s, psychiatry is a branch of medicine dealing with disorders of the mind. WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 482 (1986). Medicine, in turn, is defined as the science of treating and preventing diseases. Id. at 375.

166. United States v. Cotter, 60 F.2d 689, 693 (2d Cir. 1932).


The difficulty in defining “scientific” has inhibited courts from making such an attempt. For example, in Compton v. Subaru of America, Inc., 82 F.3d 1513 (10 Cir. 1996), the court expressly declined to reach the issue of whether Daubert applies to all expert testimony. Id. at 1516 n.1. Nevertheless, the court held that application of the Daubert factors is unwarranted in cases where expert testimony is based solely upon experience or training. Id. at 1518. The Compton court seemed tempted to limit Daubert’s applicability to scientific testimony, but did not want to confront the meaning of “scientific.”

The Fourth Circuit has also backed away from confronting the meaning of “scientific.” See Freeman v. Case Corp., 118 F.3d 1011, 1016 n.6 (4th Cir. 1997). The Freeman
There is no "right" answer and this Comment certainly does not suggest there is one. However, rather than pouring over volumes of literature in this pursuit, lower courts might be better off focusing on the Supreme Court's limited discussion of science in *Daubert*. In *Daubert*, Justice Blackmun stated that, "in order to qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method."\(^{168}\) In other words, opinions are of a scientific nature if they were sought to be validated through the scientific method.

The modern view of the scientific method, according to scientist George Gale, is as follows: "[T]he scientist first sets up an experiment; second, observes what occurs in the experiment; third, reaches a preliminary hypothesis to describe the occurrence; fourth, runs further experiments to test the hypothesis; and finally, corrects or modifies the hypothesis in light of the results of the extended experimental test."\(^{169}\) While this definition speaks of experimental testing, the scientific method also incorporates observational testing.\(^{170}\) Many hypotheses, for practical reasons, cannot be experimentally tested.\(^{171}\) For example, consider a psychologist studying the effects of the battered woman syndrome.\(^{172}\) The psychologist would not intentionally batter women

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170. *See* Imwinkelried, *supra* note 13, at 2276; F. JAMES RUTHERFORD & ANDREW AHLGREN, *SCIENCE FOR ALL AMERICANS* 7 (1990) ("The essence of science is validation by observation.").
172. "The battered woman syndrome is a descriptive term that refers to a cluster of typical behaviors and emotional reactions that may develop in a woman repeatedly subjected to mental and physical abuse by a male with whom she is intimately involved." Neil J. Vidmar & Regina A. Schuller, *Juries and Expert Evidence: Social*
by varying amounts and then study the effects. Rather, the psychologist would typically conduct interviews and field studies of already battered women, perhaps using comparison groups of nonbattered women or battered women who did not kill, and systematically interpret the data. So long as the psychologist corrects or modifies his hypothesis in light of his observations, he would be following the scientific method.

By the same token that some hypotheses are experimentally untestable, experimental testing is altogether unnecessary in certain branches of knowledge. For instance, taxonomy, which concerns the classification of plants and animals, rarely requires experimentation to draw conclusions. Observation of the natural world and concomitant data accumulation suffice. Other primarily observational sciences include astronomy, biology, and geology. Through inductive reasoning, specialists in these fields generalize a law or theory from a finite list of observations. Again, as long as these specialists modify or discard falsified hypotheses, they are following the scientific method.

Therefore, if a trial judge is faced with a proffer of expert testimony, he should demand that the expert identify the bases for his opinions. The expert would be required to explain how he knows what he claims to know. If the expert claims that his opinions were the product of the scientific method and the reasonable inferences made during its course, the court should apply Daubert’s standard of admissibility. If the expert claims that his opinions were gained through experiences of a more general nature, and not by some methodology of forming hypotheses and then engaging in experimentation or observation to confirm or falsify the hypotheses, the court should resort to its applicable non-Daubert standard for admissibility.

Daubert’s conception of science focused on how the expert acquired his knowledge, not on the subject matter involved. Similarly, a district court’s foremost consideration in determining whether to apply Daubert should be the epistemological bases of the expert’s opinions. However,
once a court decides on its admissibility standard and begins its actual admissibility analysis, it should not ignore that certain branches of knowledge lend themselves more to validation through the scientific method than other branches.\textsuperscript{178} In fact, some scholars define science in terms of subject matter, rather than as a process for producing knowledge. For instance, professor and scientist Henry Bauer offers, "[A]mong the many possible definitions of science, ... science most fundamentally and undeniably means the study of nature ... ."\textsuperscript{179} Another scholar has written, "[W]e may perhaps say that science is a human activity developing an historically cumulative body of interrelated techniques, empirical knowledge, and theories, referring to the natural world."\textsuperscript{180} Nature, as used by both of these scholars, includes not only the physical world, but also the behavioral patterns of humans and other animals.\textsuperscript{181}

To draw this all together into some principle, when the body of knowledge upon which an expert is testifying concerns the study of nature, and the expert claims not to have validated his opinions through the scientific method, courts should be skeptical of the evidence.\textsuperscript{182}

\begin{itemize}
\item \textsuperscript{178} See RUTHERFORD & AHLGREN, supra note 170, at 4-5 ("There are many matters that cannot usefully be examined in a scientific way.").
\item \textsuperscript{179} BAUER, supra note 167, at 37.
\item \textsuperscript{180} STEPHEN F. MASON, A HISTORY OF THE SCIENCES 599 (1962).
\item \textsuperscript{181} Social scientists studying human behavior look for consistent patterns of individual and social behavior and for scientific explanations of those patterns. See RUTHERFORD & AHLGREN, supra note 170, at 79. Human behavior is affected both by genetic inheritance and by experience. See id. at 80.
\item \textsuperscript{182} What constitutes "nature" is not a discrete classification, and courts should apply a sliding scale to the degree of skepticism that they attach to opinion evidence that in some way involves nature, but which was not validated by the scientific method. For instance, courts should be very skeptical of expert testimony that pertains to a matter of embryology and that the expert does not claim to have validated through the scientific method. On the other hand, courts might be less skeptical of expert testimony that pertains to a matter of crocodile mating behavior and that the expert does not claim to have validated through the scientific method. Embryology simply seems to demand validation through testing to a greater degree than crocodile mating behavior. This Comment does not suggest any formula for how to calibrate the sliding scale. A judge's intuition on the matter will usually suffice.
\end{itemize}

One might point out that, so long as the judge is filtering expert testimony according to subject matter, it would also be fair for him to screen for testimony not involving nature, but which testimony an expert does claim to substantiate by the scientific method. For instance, should an expert testifying on a matter such as truck and auto towing, whose opinions are founded on knowledge acquired through the scientific method, be held to Daubert's standard of reliability? The answer is yes, although a
Disregard of the scientific method should not be a means to dodge Daubert's reliability inquiry. The Fifth Circuit Court of Appeals recognized this general notion when it stated:

"It seems exactly backwards that experts who purport to rely on general engineering principles and practical experience might escape screening by the district court simply by stating that their conclusions were not reached by any particular method or technique. The moral of this approach would be, the less factual support for an expert's opinions, the better."\(^{185}\)

To illustrate how application of this skepticism might play out, consider an expert testifying on the behavioral characteristics of individuals accused of child sexual abuse. Suppose that the expert claims that the knowledge underlying his opinions is derived from untested Freudian psychoanalytic theory, rather than from research according to the scientific method. Because the expert is advertising his testimony as nonscientific, courts which have differing admissibility standards for scientific and nonscientific testimony would not apply Daubert. However, because the expert is testifying on an aspect of nature—human behavior—courts should approach their admissibility analysis with strong doubts as to the testimony’s reliability.\(^{184}\)

In summary, the inquiry into the subject matter of an expert’s testimony should follow a court’s determination that the epistemological basis of an expert’s testimony is nonscientific. The court’s subsequent identification of the subject matter as involving “nature” should serve as a filter through which the court attaches to the testimony an inference that it is unreliable.\(^{185}\)

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184. *See generally* James T. Richardson et al., *The Problems of Applying Daubert to Psychological Syndrome Evidence*, 79 JUDICATURE, July-Aug. 1995, at 10, 13 (stating that given the nature and practice of Freudian psychoanalytic theory, it is unlikely that testimony based on Freudian principles could be admitted as scientific evidence under the Daubert guidelines).
185. Courts should not feel confined to limiting this inference of unreliability to the admittedly vague classification of “nature.” For example, consider a recent Seventh Circuit case in which an expert in a products liability action offered an opinion with regard to the feasibility of alternative design, yet did not purport to have substantiated his opinion through the scientific method. *See* Cummins v. Lyle Indus., 93 F.3d 362, 369 (7th Cir. 1996). The court held:

"The opinions offered by Dr. Carpenter in this case clearly lend themselves to testing and substantiation by the scientific method. The district court clearly acted well within its discretion in concluding that the absence of such testing indicated that the witness’ proffered opinions could not fairly be characterized..."
V. A Model for Courts to Use in Performing Their Admissibility Analysis Under Rule 702

This model is intended to assist federal courts in conducting their admissibility analysis of any proffer of expert testimony under Rule 702. The model is aspirational and not strictly bound to any court's precedent, although the model is consistent with the language of Daubert. Appendices A and B provide a skeleton of the model, highlighting the main questions trial judges must ask in their gatekeeping role.

The issues affecting admissibility are set forth in the model in the sequence in which courts should approach them. Although the model addresses the qualifications and assistance requirements, most of the discussion is devoted to the reliability inquiry, which courts have referred to as the "touchstone" of Rule 702.186

The model is simply offered to provide a court with ideas, not to suggest that testimony be excluded in any particular case. Its overarching theme is flexibility in application, but insistence on reliability.

A. Qualifications

The first question a court might ask upon the proffer of any type of expert testimony is whether the expert is qualified to act as a witness. The approach suggested by Margaret A. Berger in her contribution to the Federal Judicial Center's Reference Manual on Scientific Evidence is for...
courts to undertake a two-step inquiry.187 Berger's two-step inquiry is an effective process for approaching Rule 702's qualifications requirement, and this model essentially adopts it.

Under the first prong of this inquiry, a court must determine whether the proffered expert has minimal educational or experiential qualifications in the field upon which he proposes to testify.188 According to Rule 702, which courts generally agree governs issues relating to an expert's qualifications, an expert may be qualified to testify by knowledge, skill, experience, training, or education.189 The Advisory Committee's note states that "within the scope of the rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called 'skilled' witnesses, such as bankers or landowners testifying to land values."190 The fact that an expert has a particular title or degree, or the fact that he lacks a particular title or degree, should not be dispositive in qualifying him.191 Furthermore, the fact that a proffered expert has never before been qualified as an expert witness should not carry too much weight. As the Second Circuit has observed, "even the most qualified expert must have his first day in court."192

If the expert passes the first prong, the court should then compare the expert's area of expertise with the particular opinions the expert seeks to offer.193 This second prong is more focused than the first, and its aim is to make sure that there is always a conjunction between the

187. Margaret A. Berger, Evidentiary Framework, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE, 37, 55 (1994). Professor Berger's contribution provides a framework for judges in considering disputes over the admissibility of various kinds of scientific evidence. See id. at 43. Berger states that many sections of her paper, particularly the section dealing with an expert's qualifications, have application beyond merely scientific testimony. Id. at 44.
188. See id. at 55.
189. FED. R. EVID. 702.
190. FED. R. EVID. 702 advisory committee's note.
191. Berger, supra note 187, at 58. According to the Third Circuit, "it is an abuse of discretion to exclude testimony simply because the trial court does not deem the proposed expert to be best qualified or because the proposed expert does not have the specialization that the court considers most appropriate." Holbrook v. Lykes Bros. S.S. Co., Inc., 80 F.3d 777, 782 (3rd Cir. 1996).

Some courts might deviate from this language of Holbrook, however, if the expert happens to be in the employ of a company or industry whose practices are being challenged. The Second Circuit has noted, "If the only experts permitted to testify inevitably represent the same side of a civil case, those who possess these experts can, for all practical purposes, set their own standards." Stagl v. Delta Air Lines, Inc., 117 F.3d 76, 81 (2d Cir. 1997).
192. United States v. Locascio, 6 F.3d 924, 937 (2d Cir. 1993).
193. See Berger, supra note 187, at 55.
expert’s qualifications and his opinions. To some extent, this inquiry will overlap with the court’s analysis of the reliability of an expert’s opinions. The overlap will be particularly apparent in the case of non-scientific testimony, where the reliability inquiry centers upon the general experiential bases underlying the expert’s opinion, rather than upon the scientific validity of his reasoning and principles. To form a bridge between the qualifications and reliability requirements, a court, in conducting its reliability analysis, might take into account the degree of specialized knowledge an expert possesses about the particular issues in dispute.

A court may determine that an expert is qualified to offer opinions on only some of the issues on which he proposes to testify. In such situations, the court may impose restrictions on the opinions that the expert will be allowed to express. For instance, a court may restrict an expert’s testimony to the field in which he has specialized knowledge.

194. See Whiting v. Boston Edison Co., 891 F. Supp. 12, 24 (D. Mass. 1995) ("Just as a lawyer is not by general education and experience qualified to give an expert opinion on every subject of the law, so too a scientist or medical doctor is not presumed to have expert knowledge about every conceivable scientific principle or disease.").

195. Berger, supra note 187, at 55; see also Barrett v. Atlantic Richfield Co., 95 F.3d 375, 382 (5th Cir. 1996). In Barrett, the plaintiffs alleged personal injury and property damage as a result of alleged chemical exposure to chemicals at two federal superfund sites. Id. at 377. One of the plaintiffs’ experts, Dr. Schroeder (no first name given), an ecologist, offered to testify that mammalian species at the sites, specifically the cotton rat, had been affected by possible exposure. Id. at 382. The Fifth Circuit affirmed the district court’s decision to exclude the testimony, because Schroeder could not establish with any scientific reliability whether there was an exposure parallel between the cotton rats and human beings. Id. The Fifth Circuit determined that the testimony was unreliable, in large part, by analyzing Dr. Schroeder’s qualifications. See id. Because Schroeder’s expertise was limited to the behavior patterns of rats, the court found that he could not offer a credible scientific opinion regarding the source of the rats’ chromosomal damage. Id. Barrett stands as a prime example of a court overlapping its reliability and qualifications inquiries.

196. See United States v. Jones, 107 F.3d 1147, 1154 (6th Cir. 1997) ("[T]he general reliability of non-scientific expert testimony does not always neatly separate itself from whether the particular expert in the case is qualified and whether the testimony will be helpful to the trier of fact . . . .").

197. See Berger, supra note 187, at 55-56.

198. Id. at 63.

199. Id.

200. Id.
B. The Assistance Requirement

The next phase of a court's admissibility analysis should be Rule 702's assistance requirement. This entails an inquiry into the testimony's relevance to the facts of a case, as well as an inquiry into the testimony's helpfulness.

1. Relevance

According to Daubert, the "assist the trier of fact" portion of Rule 702 goes primarily to relevance, by which the Court meant that expert testimony must be sufficiently tied to the facts of a case such that it will aid the jury in resolving a factual dispute. Borrowing language from Downing, the Court described this consideration as one of "fit." Evidently, the Court seized upon the obvious truth that expert testimony not relating to an issue in the case cannot possibly assist the factfinder in reaching a verdict.

Questions of relevancy typically arise if an expert's proffered opinion relates to facts or data that have not been adequately established in the case. A prime example occurred in Pomella v. Regency Coach Lines, Ltd., wherein the plaintiff was injured when the car in which she was a passenger was struck by a bus. In the suit against the bus driver and the owner of the bus, the plaintiff offered three experts to testify that a non-negligent bus driver would have been able to avoid the collision. Whether the bus could have avoided the collision depend-

201. As do some courts, this Comment will refer to the "assist the trier of fact to understand the evidence or to determine a fact in issue" portion of Rule 702 as the "assistance requirement." See, e.g., United States v. Shay, 57 F.3d 126, 132 (1st Cir. 1995).
202. Even if Daubert had not read a relevance requirement into Rule 702, Rule 402 states that all relevant evidence is admissible unless otherwise provided and all evidence which is not relevant is not admissible. See Fed. R. Evid. 402.
204. Id. (quoting United States v. Downing, 753 F.2d 1224, 1242 (3d Cir. 1985)).

One court used this example to illustrate fit:

[If a plaintiff offers scientific testimony that a particular chemical causes cancer in rats in order to prove that the chemical also causes cancer in humans, the testimony will not fit the facts of the case and must be excluded unless the plaintiff also establishes that the expert can reliably extrapolate from rats to humans.]

205. See Berger, supra note 187, at 47.
207. Id. at 337.
208. Id. at 339-40.

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ed in part on the coefficient of friction between the bus's tires and the road, which was in dispute because this test was never conducted at the time of the accident.\textsuperscript{209} Although all the eyewitnesses agreed that the road was slick, the eyewitnesses disagreed on whether the road was icy, snowy, or merely wet, a matter that would have affected the coefficient of friction.\textsuperscript{210} The plaintiff's experts purported to estimate the coefficient of friction by choosing the lowest coefficient from the range for snow-covered pavement.\textsuperscript{211}

The district court excluded the plaintiff's experts because of "lack of fit,"\textsuperscript{212} stating that the experts' estimation was simply an arbitrary choice of a midpoint value within the possible range of coefficients.\textsuperscript{213} Although the experts claimed that their estimation of the coefficient of friction was most valuable to the defendants, the court concluded that, in fact, it was favorable to the plaintiff.\textsuperscript{214} Because of the speculative nature of the experts' testimony, the court found that it was irrelevant.\textsuperscript{215}

There may be cases in which a court's relevancy inquiry overlaps with its reliability inquiry. One such situation is when it appears that the expert's methodology is flawed because it involved facts or assumptions not found in the case at hand.\textsuperscript{216} The Pomella court, for instance, could have reasonably excluded the plaintiff's experts from a reliability standpoint.\textsuperscript{217}

Another scenario in which relevancy overlaps reliability is when an expert's conclusions are not commensurate with the scope of the

\begin{itemize}
  \item \textsuperscript{209} Id. at 340.
  \item \textsuperscript{210} Id. at 342.
  \item \textsuperscript{211} Id. at 343.
  \item \textsuperscript{212} Id.
  \item \textsuperscript{213} Id.
  \item \textsuperscript{214} Id.
  \item \textsuperscript{215} Id.
  \item \textsuperscript{216} See Berger, supra note 187, at 49.
  \item \textsuperscript{217} Sometimes a court's relevancy inquiry will overlap with its reliability and its Rule 703 inquiries. See, e.g., Guillory v. Domtar Indus., Inc., 95 F.3d 1320, 1331 (5th Cir. 1996). In Guillory, the court ultimately excluded the expert's testimony because it was unreliable, but added for good measure: "Certainly nothing in Rule 703 requires a court to admit an opinion based on facts that are indisputably wrong. Even if Rule 703 will not require the exclusion of such an unfounded opinion, general principles of relevance will." Id. (quoting Christophersen v. Allied-Signal Corp., 939 F.2d 1106, 1114 (5th Cir. 1991)).
\end{itemize}
methodology he employed.218 Such a scenario occurred in Vadala v.
Teledyne Industries, Inc.,219 where the executrix of the estate of a pilot
killed in an plane crash brought a negligence and breach of warranty
action against the manufacturer of the plane’s engine.220 The crash
was apparently caused when a part in the right engine came loose from
its bolts, causing oil to drain out and the engine to fail.221 An investi­
gation revealed that at some point—either during flight or afterwards in
the ground fire—the right engine damper had polymerized.222

The plaintiff’s expert, Roy Bourgault, alleged that the right-engine
damper polymerization occurred during flight, as opposed to in the
ground fire, which had caused the bolts to loosen.223 Bourgault had
two bases for his opinion. The first basis was his observation that the
rubber oil seal and O rings adjacent to the damper in the right engine
showed no signs of heat damage from the ground fire.224 Bourgault
reasoned that any ground fire sufficient to cause polymerization would
have also altered the appearance of the rubber oil seal and O rings.225
The shortcoming of Bourgault’s testimony was that he had no idea what
temperature would be required to alter the appearance of the O rings and
oil seal.226 The second basis for Bourgault’s opinion was four docu­
ments that suggested heat may cause in-flight damper failure in some
circumstances.227

The First Circuit affirmed the district court’s decision to exclude
Bourgault’s testimony.228 Although the court stressed the pertinence
of Daubert’s precept that an expert’s testimony must rest on a reliable
foundation and be relevant to the task at hand, the court did not specify
which of these two conditions the testimony failed to pass.229 The
court did not exclude the testimony because of any flawed scientific
principle—heat can cause in-flight-polymerization—there was just no
substantial basis for concluding that it had done so here. The court

218. See infra Part V.C.4 for a discussion of how, as a matter of evidentiary
reliability, the scope of an expert’s conclusions should be commensurate with the
methodology employed.
219. 44 F.3d 36 (1st Cir. 1995).
220. Id. at 36-37.
221. Id. at 38.
222. Id. Polymerization occurs when the silicone fluid in a damper is exposed to
high temperatures, causing the silicone to solidify. When polymerization occurs, the
damper’s effectiveness is decreased. Id.
223. Id.
224. Id.
225. Id. at 39.
226. Id. at 38-39.
227. Id. at 39.
228. Id.
229. See id.
stated, "We agree with the district court that the factual basis and process of reasoning relied on by the plaintiffs’ expert do not make his conclusions viable."\(^{230}\)

Some have argued that Vadala excluded the testimony simply on the basis of relevancy.\(^{231}\) However, one could also make a case that the court excluded the testimony on the basis of reliability. When the court spoke of the viability of Bourgault’s conclusions, it was expressing doubt that Bourgault could make the leap from his methodology of examining the O rings and oil seal and reviewing four ambiguous documents, to claiming that the right-engine damper polymerized during flight. In this sense, the court found that Bourgault’s testimony was simply not supported by, or not commensurate with, the methodology he employed. This would be an issue of reliability.

2. Helpfulness

The second prong of the assistance requirement is more directly in line with the denotation of assist, which is “to help.”\(^{232}\) This aspect of the assistance requirement was described by the Advisory Committee in this way:

> There is no more certain test for determining when experts may be used than the common sense inquiry whether the untrained layman would be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the dispute.\(^{233}\)

Although modern authorities conflict, the helpfulness requirement should not require that experts only testify on subjects beyond the ken of lay juries.\(^{234}\) As some commentators have argued, experts may well aid

\(^{230}\)Id. at 38.

\(^{231}\)See Fenner, supra note 15, at 1005-06 (making this argument).

\(^{232}\)See WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 132 (1986) (defining assist as to “help”).

\(^{233}\)FED. R. EVID. 702 advisory committee’s note (quoting Mason Ladd, Expert Testimony, 5 VAND. L. REV. 414, 418 (1952)); see also United States v. Shay, 57 F.3d 126, 132 (1st Cir. 1995) (quoting this portion of the Advisory Committee’s note).

\(^{234}\)See MUELLER & KIRKPATRICK, supra note 60, at 696-97 (arguing that the helpfulness requirement should not require that experts only testify on subjects beyond the ken of lay juries). But cf. Roback v. V.I.P. Transp. Inc., 90 F.3d 1207, 1215 (7th Cir. 1996). In Roback, an expert in visual perception of automobile drivers offered to testify that a driver’s being distracted compounds the difficulties of his perceiving relative velocities, as his focus is diverted from the visual cues by which he can assess
the jury in determining even familiar matters, in virtue of experience or training that provides a more thorough or refined understanding than ordinary experience provides. In situations where the expert’s testimony really is not helpful because the subject matter is simple or familiar, Rule 403 may be just as useful an outlet to exclude the testimony as Rule 702.

United States v. Rincon provides an illustration of a court excluding testimony on the basis of helpfulness, and combining Rules 702 and 403 analysis to do so. In Rincon, the defendant was indicted on two counts of unarmed robbery. The district court denied Rincon’s pre-trial motion in limine in which he sought to introduce the expert testimony of Dr. Kathy Pezdek, a Ph.D. in psychology. If permitted to testify, Pezdek would have explained, among other things, the effects of various psychological factors on eyewitness identifications. One of the bases upon which the district court excluded the proposed testimony was that the testimony invaded the province of the jury in that it did not assist the trier of fact. After a jury trial, Rincon was convicted of both robberies.

In its inquiry into the assistance requirement, the Ninth Circuit conceded that Pezdek’s proposed testimony was no doubt relevant to Rincon’s defense. The court stated, however, that the determination the evidence was relevant did not end the inquiry. Under Daubert, a district court may still exclude testimony relevant to expert evidence
pursuant to Rule 403. In light of this, the court noted that Rincon's own article on expert eyewitness testimony, which he had submitted to supplement the record, indicated that it remained to be seen whether experts can enhance jurors' ability to distinguish accurate from inaccurate witnesses, or whether the dangers of such testimony outweigh its probative value. The court concluded, "Given the powerful nature of expert testimony, coupled with its potential to mislead the jury, we cannot say that the district court erred in concluding that the proffered evidence would not assist the trier of fact and that it was likely to mislead the jury." In essence, the court borrowed language from both Rules 702 and 403, reaching an outcome that reflected "the flexible approach outlined in Daubert." The court maintained the essential balancing test of Rule 403, although substituted the "assist trier of fact" language of Rule 702 for the "probative value" language of Rule 403.

C. The Reliability Requirement

If a proffer of expert testimony survives a court's analysis of the qualifications requirement and the assistance requirement, the court should next determine whether the testimony is reliable. This involves a four-step process. First, the court should determine if the proffered testimony is of a scientific or nonscientific nature. Second, the court should determine if the expert's choice of methodology is sufficiently reliable, applying different standards for scientific and nonscientific testimony. Third, the court should examine the execution of the chosen methodology, looking out for flaws that may undermine its reliability. Fourth, the court should examine whether the expert's conclusions reasonably could be inferred from the methodology he employed. The emphasis here should not be on the substance of the expert's conclusions, but only on whether the scope of his conclusions were commensurate with the methodology he employed.

245. Id.
246. Id. at 926.
247. Id.
248. Id.
249. The portion of this model devoted to the reliability requirement in some respects resembles a model proposed in a student note in the Georgetown Law Review. See Kesan, supra note 20, at 2018-23.
250. See id. at 2022.
1. Step One: Whether the Testimony is of a Scientific or Nonscientific Nature

As described supra, Daubert identified testimony as scientific in nature if the expert claims to have validated his opinions or assertions by the scientific method.\footnote{See supra Part IV.C; Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 590 (1993).} Whether testimony is scientific or nonscientific is especially important if a court has significantly different admissibility standards for the two classifications of testimony.\footnote{See supra Part IV.B.} However, even in the model proposed by this Comment, which has a reliability requirement for all expert testimony, the classification of scientific or nonscientific still has implications. Some of the considerations that are helpful in determining the reliability of scientific testimony are much less helpful with nonscientific testimony. To understand why, it might be useful to know a few basic principles about epistemology.

Epistemology, referred to by some as "theory of knowledge,"\footnote{E.g., A.D. WOOZLEY, THEORY OF KNOWLEDGE: AN INTRODUCTION 12 (1949).} is the study of human cognition.\footnote{JOSEPH OWENS, COGNITION: AN EPISTEMOLOGICAL INQUIRY 4 (1992).} People are generally aware that they are knowing and take cognition for granted.\footnote{See id. at 4-5.} Epistemology is the challenging philosophical discipline of asking what our mind is actually aware of in cognition.\footnote{WOOZLEY, supra note 253, at 29.} In this sense, cognition is not only the topic of the inquiry, it is also the examiner.\footnote{OWENS, supra note 254, at 20.}

Many of the early philosophers to struggle with epistemological questions,\footnote{The term "epistemology" actually only dates from the mid-nineteenth century.} among them Plato\footnote{Plato was born circa 427 and died 347 B.C. ANTONY FLEW, AN INTRODUCTION TO WESTERN PHILOSOPHY: IDEAS AND ARGUMENT FROM PLATO TO SARTRE 26 (1971).} and René Descartes,\footnote{Descartes (1596-1650) is considered by some to be the founder of modern philosophy. See BERTRAND RUSSELL, A HISTORY OF WESTERN PHILOSOPHY 557 (1945).} believed that some ideas or principles were innate to mankind.\footnote{See id. at 609.} John Locke,\footnote{The English philosopher John Locke was born in 1632 and died in 1704. Id. at 604.} a seventeenth century English philosopher who is commonly regarded as the founder of empiricism, rejected innate ideas.\footnote{Id. at 610.}
believed that all knowledge (with the possible exception of logic and mathematics) is derived from experience. 264 Although the idea that all knowledge is derived from experience may not sound that newsworthy in this day and age, at the time Locke's empiricism was a bold innovation. 265

Locke's empiricism meshed with the beginning of modern science, which was under way by the early seventeenth century. 266 Francis Bacon, 267 an English philosopher and scientist, was one of the leaders of the new scientific movement. 268 Bacon attempted to give direction to this movement by defining the general methodology of the sciences and the mode of its application. 269 In his main work, the Great Inausteration of Learning, Bacon dedicated a portion of the work to an analysis of the scientific method, or "New Instrument" as he called it. 270 Like the modern scientific method, Bacon's method involved framing hypotheses and conducting experiments to test these hypotheses. 271

Although influential to later generations of scientists, Bacon's "New Instrument" did not receive immediate application during his lifetime. 272 That step was taken by Sir Isaac Newton, 273 an English scientist of the late seventeenth and early eighteenth centuries, who believed like Bacon that scientific knowledge was derived by experiment, not intuition. 274 Newton relied on the experimental method to derive his laws of mechanics, and his reliance on that methodology is sometimes referred to as "Newtonian science." 275

Bacon and Newton's theories on how to derive scientific knowledge were compatible with Locke's theory that all knowledge was acquired

264. Id. at 609.
265. See id. at 610.
266. MASON, supra note 180, at 140.
267. Bacon was born in 1561 and died in 1626. Id. at 141.
268. Id.
269. Id.
270. See id. at 140-41.
271. Id. at 146.
272. Id. at 198.
273. Newton was born in 1642 and died in 1727. Id. at 198.
274. Id. at 204. According to one author, "[w]hat Bacon had prophesied in the way of an inductive interpretation of nature, Newton had brought to fruition." LARRY LAUDAN, SCIENCE AND HYPOTHESIS: HISTORICAL ESSAYS ON SCIENTIFIC METHODOLOGY 86 (1981).
275. Imwinkelried, supra note 13, at 2276.
through experience. The three men’s theories were distinctively empirical. Scientific knowledge depended on experiment, while other bodies of knowledge depended on the more general kind of experiences that shape everyday life.

In *Daubert*, Justice Blackmun asked how a scientist comes to know that a scientific proposition is true, and found the answer in experimental science. Accordingly, when Blackmun propounded his standard for the reliability of scientific testimony, he focused on the methods of experimental science, which involved such considerations as falsifiability and rate of error. If the Supreme Court were ever faced with a case in which a party contested the admissibility of nonscientific expert testimony, the Court might take a similarly epistemological approach as it did in *Daubert*. The court would ask how the nonscientific expert came to know that his opinions were true, and probably find that the nonscientific expert’s opinions were shaped by personal or vicarious experiences gained through work, hobby, education, or training. Accordingly, in conceiving a standard of reliability for nonscientific testimony, the court should focus on the methods in which nonscientists gain their relevant experiences. This standard should differ from *Daubert*’s, because issues such as testability and rate of error have little to no value in analyzing a nonscientific expert’s relevant experiences.

Because the classification of an expert’s testimony should affect a court’s analysis of the expert’s choice of methodology, the determination of whether testimony is scientific or nonscientific should be a court’s first step in its reliability analysis. The court should make this determination with *every opinion* an expert offers, because some opinions may be of a scientific nature, while others may not. If an

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276. See id. at 2277; Berger, *supra* note 187, at 82 ("The *Daubert* opinion views science as an empirical enterprise and emphasizes the need for validation through testing.").

277. See *Imwinkelried, supra* note 13, at 2277.

278. Judge Richard Posner has remarked on the difference between how scientific and nonscientific experts acquire the knowledge informing their opinions. See *American Int’l Adjustment Co. v. Galvin*, 86 F.3d 1455, 1465 (7th Cir. 1996) (Posner, J., dissenting). *American International* was a legal malpractice case in which the defendant lawyer offered an expert to rebut the charge of malpractice. *Id.* at 1461. In his dissent, Posner argued that *Daubert* makes clear that it is the responsibility of district courts to make sure that when scientific and nonscientific experts testify in court, they adhere to the same standards of intellectual rigor that are demanded in their professional work. *Id.* at 1465. Posner pointed out, however, that what counts as intellectual rigor will be different in different fields. *Id.* He surmised, “A lawyer who is asked to testify about the standard of care in trying a personal injury case is not expected to employ the scientific method, because he doesn’t use that method in his ordinary professional work. But he is expected to defend his conclusion with reasons.” *Id.*
expert claims that the knowledge underlying a particular opinion was derived by the scientific method, meaning that the expert formed a hypothesis and engaged in experimentation or observation to confirm or falsify the hypothesis, the court should apply Daubert. If the expert claims that the knowledge underlying a particular opinion was derived by the more general range of experiences that one acquires through work, hobby, education, or training, the court should apply this model’s standard for determining the reliability of a nonscientific expert’s choice of methodology.

Courts will encounter cases where the expert’s methodology has certain qualities of, but may not match, paradigmatic application of the scientific method. In these close-call cases, whether the court applies this model’s standard of reliability for scientific or nonscientific testimony will not typically affect whether the testimony is admitted. As will be evident, the nonscientific standard’s quantitative and qualitative analysis is similar enough to the scientific standard’s focus on falsifiability and rate of error that a court should reach the same result.

The bottom line should always be reliability. If a court feels that some aspects of the Daubert standard and some aspects of the model’s nonscientific standard are both revealing on the question of reliability, the court should not feel obligated to adhere entirely to one standard over the other.

279. See Martin Goldstein & Inge F. Goldstein, How We Know: An Exploration of the Scientific Process 4-5 (1978). The Goldsteins observe:

[M]ost people, in the course of making the various choices and decisions of daily life—whom to vote for, what to buy, where to live, what to eat—apply some features of scientific method in an intuitive way. They usually do not think of what they do as being an application of scientific method, nor do they use it to the maximum extent.

Id.
2. Step Two: Analyzing the Reliability of the Expert’s Choice of Methodology

a. Scientific Testimony

_Daubert_ is stare decisis for scientific testimony. Thus, when faced with a proffer of scientific testimony, a district court must ascertain whether it is “scientific knowledge” under _Daubert_. _Daubert_’s essential test for determining whether testimony is scientific knowledge is “whether the reasoning or methodology underlying the testimony is scientifically valid.” The Court provided four factors which might bear on this inquiry, including testability, peer review or publication, rate of error, and general acceptance. _Daubert_ emphasized that the factors should be exercised flexibly, and courts and commentators generally agree.

Although _Daubert_’s admissibility test may be most apt for physical or “hard” sciences, _Daubert_ should also be the standard for social sciences. All purportedly scientific testimony should be scientifical-

280. There are dozens and dozens of articles on how to analyze a scientific expert’s methodology under _Daubert_. This Comment touches upon only a few of the most central ideas.
282. _Id._ at 592-93.
283. _Daubert_ stated that testability was a key question in determining whether a theory or technique was scientific knowledge. _Id._ at 593. If an expert claims to have relied on the scientific method, most often his theory or technique will be testable. Nevertheless, there may be cases in which an expert claims to have relied on the scientific method, but in fact did not rely on a demonstrable testing procedure that could be replicated by others.
284. _Id._ at 593-94.
285. _Id._ at 594.
286. _See, e.g._, United States v. Sherwood, 98 F.3d 402 (9th Cir. 1996). The defendants in _Sherwood_, who were convicted of kidnapping and other charges, contended on appeal that the district court erred in admitting the testimony of Kenneth Dunn, a fingerprint expert. _Id._ at 407-08. In its inquiry into whether Dunn’s testimony was scientific knowledge, the court acknowledged that the four _Daubert_ factors may be relevant. _Id._ at 408. However, the court stated, “We consider these factors non-exhaustive and recognize that not every factor will be applicable in every case.” _Id._. The court held that the district court did not commit error in admitting the testimony because Dunn’s technique was generally accepted and had been subject to peer review and publication. _Id._.
287. _See, e.g._, Friedman, _supra_ note 23, at 141; Nahas, _supra_ note 65, at 121.
288. Social sciences, sometimes referred to as human or behavioral sciences, concern themselves with human behavior. ANDREW G. VAN MELSEN, SCIENCE AND RESPONSIBILITY 51-52 (1970). Perhaps the strongest evidence that the Supreme Court intended _Daubert_’s standard of admissibility to apply to social sciences is the Court’s remand of a case involving expert testimony on eyewitness identification to be reviewed.
ly valid. It is true that the social sciences do not lend themselves as well to experimentation and can rarely be quantified by rate of error. For this reason, when the Daubert factors are unhelpful, courts should determine the validity of a social scientist’s opinions by other indicia.

Some indicia of scientific validity a court might consider are operationalization of terms; generalization of results over time, persons, and settings; controlling for compounding factors; and selection and investigator bias. Other indicia might be whether the instrumentation used was well accepted in the relevant discipline and whether there has been adequate replication of the findings.

Some expert testimony, particularly that given by engineers, mechanics, and electricians, is founded on some combination of known scientific principles, the expert’s education and experience, and a factual study of the case. These experts would be likely to testify in a products liability or accident case, where the product failure or accident cannot be


289. See United States v. Hall, 93 F.3d 1337, 1342 (7th Cir. 1996) (applying Daubert to expert psychological and psychiatric testimony, although commenting that social sciences have posed both analytical and practical difficulties for courts attempting to apply Rule 702 and Daubert); United States v. Rouse, 100 F.3d 560, 567-68 (8th Cir. 1996). In Rouse, the Eighth Circuit reversed the trial court’s ruling to exclude the expert testimony of a psychologist who offered to testify regarding child witnesses of sexual abuse and their susceptibility to faulty memory. Rouse, 100 F.3d at 567. The court indicated that Daubert does apply to soft sciences and that such testimony must be reliable and relevant. Id. Nevertheless, the court pointed out, “Here, we deal with a social science in which the research, theories and opinions cannot have the exactness of hard science methodologies such as blood tests, DNA, spectographic evidence or chemical exposures with which Daubert dealt. . . . Daubert principles may not fully apply to certain social science evidence.” Id. at 567-68.

290. “Operationalization” refers to the process of defining the variables under study in a way amenable to measurement. This allows for experiments to be more easily replicated. Duncan, supra note 173, at 756 n.31.

291. “Selection bias” refers to preexisting differences between samples. Id. at 756 n.34.

292. “Generalization” is the method for evaluating how far beyond the specific facts of a study validly-produced research findings remain valid. Id. at 756 n.32.

293. “Compounding factors” are alternative causes of a phenomenon. Id. at 756 n.33.

294. Id. at 756.

295. Richardson et al., supra note 184, at 15.

296. One commentator has described this species of testimony as “quasi-scientific.” Agrimonti, supra note 13, at 136 n.13.

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duplicated. To the extent that these experts rest their opinions on scientific theories or techniques, courts should apply Daubert’s standard of reliability. To the extent these experts rest their opinions on the more general experiences that inform technical or specialized testimony, the court should apply this model’s standard for nonscientific testimony. Whether expert testimony is being offered by a physicist, a psychologist, or an engineer, the court must perform its gatekeeping role of ensuring that the choice of methodology rests on scientifically valid principles. By zeroing in on the epistemological foundation for each opinion these experts have to offer, the model suggested by this Comment should do the chore of gauging the opinion’s reliability.

b. Nonscientific Testimony

i. Initial Screening Procedure

If a district court determines that a proffer of testimony is nonscientific, meaning that the expert’s purported knowledge was not acquired through the scientific method, the court should perform the screening procedure discussed in Part IV.C of this Comment before undertaking its reliability analysis. The screening procedure recognizes that Daubert’s conception of science focused on how the expert acquired his knowledge, not on the subject matter involved. Therefore, when the body of knowledge upon which an expert is testifying concerns the study of nature, including human and animal behavior, and the expert claims not to have validated his opinions through the scientific method, courts should be very skeptical of the evidence. This skepticism should amount to an inference that the testimony is unreliable. An expert’s disregarding the scientific method to explain a natural phenomenon should not be a

297. See Coben, supra note 13, at 56 (remarking how certain product failures cannot be duplicated).
298. See Cummins v. Lyle Indus., 93 F.3d 362 (7th Cir. 1996). Cummins brought a product liability action against Lyle after three of Cummins’s fingers were severed in a trim press manufactured by Lyle. Id. at 365. The district court excluded the expert testimony of Dr. Thomas Carpenter, who intended to testify on behalf of plaintiff in regard to the feasibility of alternative design and the adequacy of the instructions for the trim press. Id. at 366. On appeal, plaintiff argued that Daubert’s standard of admissibility should not apply, as Carpenter was not testifying on a pure scientific theory, but rather the application of well-known instruments of the engineering profession to a particular and not-out-of-the-ordinary application. Id. at 367 n.2. The Eighth Circuit disagreed, stating that the Daubert analysis should not be abandoned simply because the issue before the court, although rooted in science, involved application of science to a concrete and practical problem. Id. The court added that, in some “as applied” situations, some of the Daubert factors are worthy of less emphasis than in situations involving a more abstract or novel scientific theory. Id.
free ticket to avoid Daubert’s emphasis on evidentiary reliability. The initial screening procedure should serve as a filter through which a court attaches to such testimony an inference that it is unreliable.

**ii. The Essential Test**

Under Daubert, the essential test for determining the reliability of scientific testimony is whether the reasoning or methodology underlying the testimony is scientifically valid. The essential test for determining the reliability of nonscientific testimony should simply be whether the expert’s reasoning or methodology is trustworthy. By this test, evidentiary reliability is accorded its usual connotation in evidence law.

To frame objective standards for determining trustworthiness, one should take into account how nonscientific experts come to acquire the knowledge which underlies their opinions. How do experts on airline security, candy making, crime insurance, snake handling, and estate planning gain their expertise? Unlike scientific experts, whose relevant experiences are generally acquired through execution of the scientific method and the inferences made during its course, the nonscientific expert’s relevant experiences are generally acquired through education, training, employment, and pursuance of a hobby, as well as the inferences made during the course of each. Of the four reliability factors for nonscientific testimony proposed in this model, the first two mentioned below give special consideration to how nonscientific knowledge is obtained. As with the Daubert factors, the nonscientific factors should be applied in a flexible manner.


300. See id. at 591-92 n.9 (equating evidentiary reliability with trustworthiness); Fed. R. Evid. Article VIII advisory committee introductory note (discussing the general common law rule excluding hearsay and the rule’s numerous exceptions “under circumstances supposed to furnish guarantees of trustworthiness”).

301. With both scientific and nonscientific experts, the relevant experiences may have been acquired either personally or vicariously. See Imwinkelried, supra note 13, at 2289-90 (“[J]ust as a scientist can gain vicarious experience by speaking with other scientists and reading written descriptions of their experiments, nonscientific witnesses sometimes rely on vicarious as well as personal experience.”).
iii. The Four Factors

The first factor a court should consider in determining the reliability of a nonscientific expert’s opinion is whether the experiences underlying the opinion are of sufficient quantity to render the opinion trustworthy. Several subfactors will bear on this inquiry. The second factor a court should consider is whether the experiences underlying the opinion are of sufficient quality to render the opinion trustworthy. Several subfactors will bear on this inquiry as well. The third and fourth factors are Daubert factors which have been slightly reformulated to fit into the context of nonscientific testimony. They are whether the expert’s theories or techniques have been subjected to peer review and publication, and whether the theories or techniques are generally accepted in the relevant community.

a. Quantitative Analysis

One factor a court might consider in analyzing the trustworthiness of a nonscientific expert’s opinion is the sheer number of experiences upon which the expert claims to have based his opinions. So, for a nonscientific expert whose opinion on a fact in issue is derived in part on his educational background, a court might consider how many years of education on the subject the expert received. For a nonscientific expert whose opinion on a fact in issue is derived in part from her work background, a court might consider how long the expert has worked in the relevant field, as well as the number of instances in which the expert confronted the precise type of issue at hand.

Consider, for instance, a banker offering to testify on the subject of lender liability. In judging the reliability of the banker’s opinions, the court should consider the quantity of courses and time the expert spent

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302. See id. at 2290-94. In his epistemological analysis of a nonscientific expert’s opinions, Imwinkelried explored what impact the quantity and quality of the expert’s experiences has on the reliability of the expert’s opinions. Id. Imwinkelried was led to this focus in part by the work of David Hume, an eighteenth century philosopher. Id. Although this model borrows some of Imwinkelried’s ideas on the quantity and quality of experiences, the model does not attempt to further tie those ideas to Hume. Hume’s rejection of induction and his belief that nothing is to be learned from experiment and observation make it conceptually difficult to use his philosophy as a tool to analyze the reliability of an expert’s proffered knowledge. See generally RUSSELL, supra note 260, at 672-73 (discussing Hume’s skepticism).

303. See Imwinkelried, supra note 13, at 2290-91.

304. As discussed supra Part V.A, a court’s analysis of the reliability of a nonscientific expert’s opinions will often overlap with its analysis of the nonscientific expert’s qualifications.
during her education dedicated to the subject of lender liability. The court should also consider the quantity of time the expert spent in the banking industry, as well as the quantity of specific instances in which the expert dealt with issues relating to lender liability.

As it performs its quantitative analysis, a court should pay close attention to (1) the expert’s inclination towards superlatives, (2) the size of the relevant universe in which the expert is basing his opinions, and (3) the elasticity of the learning curve on the subject of the testimony. These three considerations are fairly routine, and a court should expand its quantitative analysis to include other considerations when appropriate.

If an expert is offering her opinions in the form of, or close to, superlatives, a court should expect a greater quantity of experiences than if the expert were speaking in generalities. For example, suppose that one expert in auto sales offered to testify that it would be “uncommon” for a used car dealer to sell a used car without first giving the car a smog test. Suppose that a second expert in auto sales offered to testify that car dealers would “never” sell a used car without first giving it a smog test. For a court to feel assured of the reliability of such a strong statement by the second expert, the court would be justified in demanding from the second expert a greater quantity of experiences in the used car business than the court would demand from the first expert. To know that the practice of selling unsmogged cars “never” occurred, the second expert would need to have spoken to many used car dealers or have other substantial experience.

A court’s quantitative analysis should also be informed by the size of the relevant universe in which the expert is basing her opinions. The greater the universe, the more a court would expect of the expert in terms of quantity of experiences. For example, suppose that one auto sales expert offered to testify that no major car dealership in San Diego would ever sell an unsmogged car. The second auto sales expert offered to testify that no used car dealer, anywhere from San Diego to Sarasota, would ever sell an unsmogged car. For a court to feel assured of the trustworthiness of the second expert’s opinion, the court might demand a greater quantity of experiences than the court demands of the first. The size of the relevant universe is greater in the case of the second

305. See Imwinkelried, supra note 13, at 2291 (referring to “the tenor of the testimony and the size of the relevant universe”).

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The third factor a court may weigh into its quantitative analysis is the elasticity of the learning curve on the subject of the testimony. The easier a body of nonscientific knowledge is to learn, the fewer experiences a court would require to feel assured of the reliability of an expert's opinions. For example, consider an expert on horses who first intends to testify as to the proper manner of changing a horse's shoes. The expert next intends to testify on the practice and techniques of breeding thoroughbreds. Both pieces of testimony are beyond the ken of the average lay juror in a Manhattan courtroom, but surely it took fewer experiences for the expert to gain the knowledge necessary to testify reliably on the first matter. The first matter is less complex, and the learning curve would be more elastic. A court might admit the expert's testimony on the first matter if he had seen a horse's shoe changed on a dozen occasions, but might not admit the testimony on the second matter if the expert only had experience with a dozen horses being bred.

b. Qualitative Analysis

With a scientific opinion, courts can judge the quality of an expert's experiences by considering such factors as rate of error and the maintenance of standards controlling a technique's operation. With a nonscientific opinion, courts can judge the quality of an expert's experiences by considering (1) the consistency of the experiences that inform his opinion, (2) the similarity of the experiences that inform his opinion, (3) whether the experiences were personal in nature or vicarious, and (4) how recent the experiences were.

Consistency plays a similar role with regard to nonscientific testimony as rate of error does with scientific testimony. With nonscientific testimony, an expert's knowledge is informed by personal or vicarious experiences, and based on patterns of consistency he is able to draw links between cause and effect. The more consistently an expert

306. Of course the intelligence of the expert may be just as important as the simplicity or difficulty of the subject of the testimony. One can assume a trial judge will take into account an expert's apparent mental acumen without a model to suggest that he do so.

307. See Imwinkelried, supra note 13, at 2292-93 (mentioning this consideration).

308. See id. (mentioning this consideration).
observes that a certain cause leads to a certain effect, the more justified the expert is in forming an opinion on causation.  

The similarity of experiences upon which a nonscientific expert’s opinion is based should also inform the court of the opinion’s trustworthiness. The more similar a nonscientific expert’s experiences are to the fact in issue, the more reliable a basis the expert has to form an opinion. For example, consider a maritime expert who offered to testify that a captain’s decision to sail his vessel into the face of a severe blizzard fell below the standard of care. The expert had no experience on the effects blizzards can have on a vessel’s seaworthiness. However, he had studied at great length and in some cases personally observed the effects hurricanes, monsoons, and other natural occurrences have on a vessel’s seaworthiness. A court might find that the expert’s experiences were too dissimilar to a vessel’s setting sail into a blizzard for him to form a reliable opinion on the matter. Other courts might disagree, finding that the expert’s general experience on the effect weather can have on a vessel’s seaworthiness provides him with sufficient knowledge to provide a reliable opinion in this case.

A court might also judge the quality of a nonscientific expert’s experiences by determining whether the expert had acquired those experiences firsthand or vicariously. Firsthand experiences may often be more reliable than those obtained vicariously. Experiences of another that are shared with an expert and then incorporated into the expert’s body of knowledge suffer from the same risks that courts face with hearsay. The person who shares the experiences can be likened to the declarant in a hearsay situation. The experiences the declarant shares suffer from the risk of ambiguity, in that the declarant may not be clear in what he had experienced, and the risk of candor, in that the declarant may be lying. The experiences the declarant shares also suffer from the

309. See Vadala v. Teledyne Indus., Inc., 44 F.3d 36, 39 (1st Cir. 1995) (“Certainly the fact that there is a pattern of occurrences, reflecting an apparent cause and effect sequence, can strengthen the likelihood that the present case is one more in the pattern. This is how human beings reason about circumstantial evidence.”).

310. See id. After discussing how consistency of experiences strengthens an inference, the Vadala court added, “But the strength of the inference depends very much on further facts, for example, the comparative frequency of the pattern [a quantitative analysis] and the tightness of the match [an inquiry into similarity of experiences] between the perceived pattern and the present accident.” Id. (emphasis added).

risk of failed memory, in that the declarant may have forgotten what he had experienced, and the risk of misperception, in that the declarant may have simply misperceived the experience. Therefore, if an expert’s knowledge on a subject is largely dependent upon the experiences of others, a court might be more skeptical of the reliability of his opinions than if the knowledge were acquired firsthand. A fourth consideration bearing on the quality of a nonscientific expert’s experiences is how recently the experiences occurred. Unlike the study of the natural world, which lends itself to timeless scientific laws, the subject matter that comprises nonscientific testimony is usually evolving. The standard of care for a tax attorney may not be the same today as it was a generation ago. Drug traffickers are more sophisticated than in the past. The wig industry may have suffered with the advent of hair implants. In some fields, it is clear that an expert’s experiences must be fresh to be trustworthy.

A further justification for inquiring into how recently a nonscientific expert acquired his experiences is the fact that memories fade. Moreover, unlike scientists who typically record the results of their research in some systematic fashion, nonscientific experts are generally more relaxed in their efforts to record the experiences underlying their opinions. Accordingly, courts should be wary of nonscientific experts whose relevant experiences were acquired some time ago and were not recorded in a timely and systematic manner.

c. Peer Review and Publication

The second Daubert factor—whether a theory or technique has been subjected to peer review and publication—may be pertinent in determining the trustworthiness of some proffers of nonscientific expert testimony. This factor might be reformulated for nonscientific testimony as: “whether the experiential bases that inform an expert’s opinion have been subjected to peer review and publication.” Naturally, this would include both personal and vicarious experiences. However, if an expert’s experiences had been peer reviewed, more often they would be vicarious

312. If a court determines that an expert’s experience was obtained vicariously, the court should still do more to inquire into the quality of the experience. An experience shared between experts may be more reliable than an experience shared between a layman and an expert. An experience that an expert acquired from a reputable book would obviously be more reliable than an experience acquired from a newsstand tabloid.

313. See RUTHERFORD & AHLGREN, supra note 170, at 4. According to Rutherford and Ahlgren, “[a]lthough scientists reject the notion of attaining absolute truth and accept some uncertainty as part of nature, most scientific knowledge is durable.” Id.

314. See Imwinkelried, supra note 13, at 2290 (observing same).

in that the expert had consulted some publication or utilized some well-known methodology. Less often would an expert have received peer review of his personal experiences.

To illustrate how this reformulated second Daubert factor might work, consider an expert in rare coins who intends to testify as to the value of a collection of eighteenth century American coins. In appraising each coin, the expert relied primarily on a tradebook published by a small Canadian press. The tradebook assigns values to coins based on quality ratings. In his motion in limine to exclude this expert testimony, the opponent directed the court to two other tradebooks. These two tradebooks have over ten times the circulation of the expert’s tradebook and were published by America’s two largest rare coins trade associations. These two tradebooks thoroughly discredit the small Canadian press used by the expert, and would value the coin collection at double the expert’s figure. In this circumstance, a court might determine that the primary experience upon which the expert based his opinions had been subjected to peer review and shown to be flawed.

**d. General Acceptance**

After the rare coins hypothetical above, it would not be a great leap to see how general acceptance might assist a court in determining the reliability of a nonscientific expert’s opinion. For instance, in *Frymire-Brinati v. KPMG Peat Marwick*, 316 a pair of investors brought suit against Peat Marwick for securities fraud. 317 Peat Marwick had audited and certified financial statements on which the investors claimed to have relied in making their investments. 318 William Hassett, the plaintiff’s star expert witness and the manager of a Chicago accounting firm, testified at trial that in conducting the audit of the relevant financial statements, Peat Marwick did not state its accounts according to Generally Accepted Accounting Principles. 319 Hassett’s opinions rested in large part on his use of a controversial discounted cash flow

316. 2 F.3d 183 (7th Cir. 1993) (also discussed *supra* note 83).
317. *Id*. at 185-86.
318. *Id*. at 186.
319. *Id*.
He admitted that his valuations were imprecise and only "'a fairly simple pass at what the magnitude of the problem was.'"321 The Seventh Circuit held that the district court could not properly have admitted the testimony under Rule 702.322 According to the Seventh Circuit, a trial judge must ensure that all expert testimony is reliable.323 The court further stated, "Admitting Hassett’s ‘fairly simple pass’ into evidence just because he is an expert in accounting is problematic, for Hassett conceded that he did not employ the methodology that experts in valuation find essential."324 Evidently, the fact that Hassett’s methodology was not generally accepted in the accounting community was important to the Seventh Circuit’s reliability analysis.

3. Step Three: Analyzing the Execution of the Chosen Methodology in the Particular Case

Even if an expert’s chosen methodology is reliable in the abstract, the expert’s opinions may nevertheless be unreliable if the actual execution of the methodology in the case at hand was substantially flawed. The question a court must consider is whether the improper execution of a reliable methodology should go to the weight of the testimony or should be a basis upon which to exclude the testimony. If a court concludes that improper execution is a basis upon which to exclude the testimony, how “improper” must it be to warrant exclusion?

Some courts view improper execution only as a matter going to the weight of the evidence. For instance, in United States v. Chischilly,325 the defendant was convicted of raping and murdering a woman.326 At trial, the district court had admitted evidence of a match between a blood sample taken from the defendant and semen found on the victim’s clothing, as well as testimony regarding the random probability of such a match.327 On appeal, one of the defendant’s specific objections regarded the possible degrading of the DNA samples.328 The Ninth Circuit noted that this objection was more troubling than the defendant’s others, insofar as it was based on data specific to the defendant’s DNA test and was not rebutted with especial force by the experts retained by

320. Id.
321. Id. (quoting Hassett).
322. Id. at 187.
323. Id. at 186.
324. Id.
325. 30 F.3d 1144 (9th Cir. 1994).
326. Id. at 1146-47.
327. Id. at 1152.
328. Id. at 1154.
the government. Nevertheless, the court found that the defendant failed to demonstrate that the degradation was a result of a faulty methodology as opposed to imperfect execution of laboratory techniques whose theoretical foundation was sufficiently accepted in the scientific community to pass muster under Daubert. The court concluded, "The impact of imperfectly conducted laboratory procedures might therefore be approached more properly as an issue going not to the admissibility, but to the weight of the DNA profiling evidence."

The better approach, which this model adopts, is to have improper execution go to either admissibility or weight depending on the severity of the flaws. According to the Eighth Circuit, Daubert's requirement that a trial judge ensure that all scientific testimony is reliable suggests that the judge's gatekeeping role extends beyond the reliability of the principles or methodologies in the abstract. In order to determine whether scientific testimony is reliable, the judge must conclude that the testimony was derived from the application of a reliable methodology or principle in the particular case. However, the court continued, not every error in application warrants exclusion. Under Daubert's flexible standard, "[a]n alleged error in the application of a reliable methodology should provide the basis for exclusion of the opinion only if that error negates the basis for the reliability of the principle itself." The key word in this standard is "negates." Presumably under Martinez, if an error only diminishes the basis for the reliability of the principle itself, the opinion would be admitted. This appears to be a fair compromise on the weight/admissibility distinction. If a reliable methodology was so improperly executed that the basis for the reliability of the principle has been negated, such testimony would be no more helpful to a jury than if the methodology itself were flawed.

329. Id.
330. Id.
331. Id.
332. United States v. Martinez, 3 F.3d 1191, 1198 (8th Cir. 1993).
333. Id.
334. Id.
335. Id.; see also In re Paoli R.R. Yard PCB Litig., 916 F.2d 829, 858 (3rd Cir. 1990) (finding that an allegation of failure to apply a scientific principle properly should support exclusion of an expert opinion only if "a reliable methodology was so altered [by a particular expert] as to skew the methodology itself").
A court’s inquiry into the execution of an expert’s methodology in a particular case will probably have more application with scientific testimony than with nonscientific testimony. By its nature, scientific testimony involves repeating techniques and experiments. Still, a court should not overlook that nonscientific experts may improperly perform methodologies that are critical to their opinions. An example of this is an expert accountant whose auditing technique is generally accepted, but whose calculations in a particular case suffer from error. Another example is a market research expert who, in a particular case, improperly executes a reliable methodology by carelessly omitting to control for a compounding factor. In these situations, it would be insufficient for a judge to limit his reliability analysis to the nonscientific expert’s methodologies in the abstract.

4. **Step Four: Comparing the Expert’s Conclusions to the Scope of his Methodology**

*Daubert* stated that the focus of Rule 702’s inquiry must be on principles and methodologies, not on the conclusions that they generate.336 Nevertheless, there are two situations in which an expert’s conclusions could be excluded under *Daubert* on the basis of reliability.337 The first and more obvious situation is when the expert’s conclusions rest on a methodology that failed the *Daubert* test. The more subtle situation is when an expert’s conclusions are not commensurate with his underlying methodology, and thus cannot satisfy *Daubert*’s standard of “knowledge.” In such cases, the expert’s conclusions could not reasonably be inferred from the methodology he employed. If the inference was unreasonable, then the conclusion will not rest on good grounds. Typically in these cases in which an expert exceeds the scope of his methodology, a court will find that there is some overlap between its reliability and “fit” analysis.

An example of a court finding that an expert’s conclusions were not commensurate with his methodology is *Grimes v. Hoffman-LaRoche*.338 Grimes sued Hoffman-LaRoche and her doctor, Pierre G. Labrecque, after developing cataracts which she claimed were caused by Accutane, a prescription drug manufactured by Hoffman-LaRoche.339 Grimes attempted to prove causation with the opinion testimony of Dr. Sidney Lerman, an ophthalmologist with a recognized expertise in evaluating

337. See Kesan, *supra* note 20, at 2022 (describing these two situations).
339. *Id.* at 34.
photochemical effects on the eye.\textsuperscript{340} Lerman’s testimony that Accutane played a role in the development of Grimes’s cataracts rested on what Lerman described as a generally accepted scientific fact that photosensitive chemicals\textsuperscript{341} that enter the lens and become photobound to lens protein will produce cataracts.\textsuperscript{342} Nevertheless, Lerman failed to identify any authoritative source which recognized this as a generally accepted fact.\textsuperscript{343} The court noted that even if this were a fact, Lerman had failed to identify any scientifically reliable basis for concluding that Accutane causes cataracts simply because other photosensitive drugs cause cataracts.\textsuperscript{344} Finally, even if it could reliably be claimed that all photosensitive chemicals that become photobound to lens protein will produce cataracts if they are present in certain concentrations, that claim would be irrelevant unless one could conclude Grimes had taken a sufficient dosage.\textsuperscript{345} The court excluded the testimony, stating that even if it was to assume that Lerman’s methodology was sound, his opinion was based “on an untested assumption which fails \textit{Daubert’s} reliability and fit requirements.”\textsuperscript{346} The court’s problem was not with Lerman’s methodologies, only his conclusions. Because Lerman’s conclusions exceeded the scope of his methodology, the court excluded the testimony on the grounds of reliability and fit.

VI. CONCLUSION

When people hear the words “expert witness,” it is not unusual for some to roll their eyes and smirk. If they take a more humorless view, perhaps they will mutter a few expletives. These reactions do not stem from any feeling that experts have no place in the courtroom. Instead, the reactions stem from a feeling that experts are simply hired guns whose opinions are adaptable to the wishes of the highest bidder. \textit{Daubert} took a stride to ameliorate the reputation of opinion evidence by requiring that all scientific testimony be reliable and relevant.

\begin{itemize}
\item \textsuperscript{340} \textit{Id.}
\item \textsuperscript{341} Accutane is a photosensitive drug. \textit{Id.} at 36.
\item \textsuperscript{342} \textit{Id.} at 37.
\item \textsuperscript{343} \textit{Id.} at 38.
\item \textsuperscript{344} \textit{Id.}
\item \textsuperscript{345} \textit{Id.}
\item \textsuperscript{346} \textit{Id.}
\end{itemize}
Quite clearly, however, *Daubert* left open the standard for the admissibility of nonscientific testimony. Some lower courts have seized upon this opening and fashioned their own standard, which often differs significantly from *Daubert's*. Because the admissibility of a proffer of expert testimony may depend on what standard a court applies, courts should develop some consistent means by which to differentiate the scientific from the nonscientific. Courts which do not apply *Daubert* to nonscientific testimony should always explicitly classify the nature of the testimony with which they are faced. Such a practice would help defuse any confusion as to why the court applied one standard of admissibility over another.

The model proposed in this Comment is for courts to use in their admissibility analysis under Rule 702, the primary rule guiding a trial judge’s gatekeeping function. The model incorporates the important policy that all testimony be reliable, and also recognizes that the criteria upon which a court determines reliability should vary with the testimony’s nature. With testimony of a nonscientific nature, the expert’s experiential foundation is typically acquired through employment, hobby, education, or training, not through application of the scientific method. Factors bearing on reliability should account for this distinction.

Expert testimony comes in many forms, and the model is not designed to be applied rigidly. One function the model should serve is to provide structure to a trial judge’s admissibility analysis. Most appellate courts review Rule 702 rulings under an abuse of discretion or some similarly deferential standard, and as a consequence the clarity of a district court’s admissibility analysis may be an important aspect as to whether the district court’s rulings will be upheld. The more vague and unstructured a district court’s analysis, the more difficulty a circuit court will have in articulating how the district court had abused its discretion. By the same token, the more crisp and structured a district court’s analysis, the easier a circuit court’s job. Circuit courts may be tentative in reversing a district court ruling unless they can articulate their

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347. Fenner, *supra* note 15, at 1028; Cook v. American S.S. Co., 53 F.3d 733, 738 (6th Cir. 1995) ("Many opinions from this and other circuits have declared that a district court’s decision to admit expert testimony is reviewed for an abuse of discretion."); *see also* United States v. Sepulveda, 15 F.3d 1161, 1183 (1st Cir. 1993) (stating that the law affords trial judges "substantial discretion" in connection with the admission or exclusion of opinion evidence, and that a trial judge’s ruling in this sphere should be upheld unless "manifestly erroneous"); United States v. Daccarett, 6 F.3d 37, 58 (2d Cir. 1993) (stating that a decision to allow expert testimony is within the broad discretion of the trial judge and is to be sustained on appeal unless "manifestly erroneous"); Hopkins v. Dow Corning Corp., 33 F.3d 1116, 1123 (9th Cir. 1994) (reviewing for abuse of discretion).
rationale in a convincing manner. Over time, district courts adhering to a model such as this one will put circuit courts in a better position to maintain consistency in the realm of expert testimony admissibility rulings.

EDSON MCCLELLAN
PROFFER OF EXPERT TESTIMONY ➔ QUALIFICATIONS REQUIREMENT
Q. Does the expert have minimal educational and experimental qualifications in the general field upon which he proposes to testify? If so, does the expert have sufficient educational and experimental qualifications with regard to each controverted issue upon which he intends to testify?

ASSISTANCE REQUIREMENT ➔ RELIABILITY REQUIREMENT
Q. Is the testimony reliable? (See four-step inquiry)

RELEVANCE
Q. Is the testimony sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute?

HELPFULNESS
Q. Would the untrained layman be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the dispute?
**THE FOUR-STEP RELIABILITY INQUIRY**

**SCIENTIFIC TESTIMONY**

**Essential Test:** Q. Is the reasoning or methodology underlying the testimony scientifically valid?

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<td><strong>Testability</strong></td>
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<td><strong>General Acceptance</strong></td>
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**EXECUTION OF THE CHOSEN METHODOLOGY**

Q. Has an error in the execution of the expert's methodology in this particular case negated the basis for the reliability of the principle itself?

**NONSCIENTIFIC TESTIMONY**

**Screening Procedure:** If the body of knowledge upon which the expert is testifying concerns the study of nature, including human (and other animal) behavior, attach to the testimony an inference that it is unreliable.

**Essential Test:** Q. Is the reasoning or methodology underlying the testimony trustworthy?

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<td><strong>Quantitative Analysis</strong></td>
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<td>Q. Does the sheer number of experiences upon which the expert claims to have based his opinions tend to establish that his opinions are trustworthy?</td>
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<td><strong>Qualitative Analysis</strong></td>
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<td>Q. Does the quality of the expert's experiences tend to establish that his opinions are trustworthy?</td>
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**COMPARING THE EXPERT'S CONCLUSIONS TO THE SCOPE OF HIS METHODOLOGY**

Q. Were the expert's conclusions commensurate with the scope of his methodology?