
ADMITTING DOUBT:
A NEW STANDARD FOR SCIENTIFIC EVIDENCE

Since *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,¹ federal judges have had the responsibility to act as gatekeepers of scientific expert testimony² through a two-pronged test to determine whether “an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand,”³ based not on the expert’s conclusions but on the “principles and methodology”⁴ used. Most state courts now use either the *Daubert* test, the older test from *Frye v. United States*⁵ requiring general acceptance by the relevant scientific community, or a mixture of the two standards.⁶

However, both tests mistakenly import scientific standards into the fundamentally legal decision of admissibility. This Note argues that admissibility should be based on relevance, with no separate reliability assessment, and also that judges should instruct juries on various factors related to reliability. This approach will improve accuracy by better informing the jury and by admitting evidence that does not meet current standards but that should be used to answer questions of fact. It also serves non-accuracy values by making adjudication fairer and by avoiding the inappropriate importation of scientific norms into law. The Note first describes relevant legal precedents and philosophy of science principles. It then discusses the different treatment of evidence in law and science and argues that current standards fall short of fulfilling the purposes of legal evidence. Finally, the Note sets out the proposed standard and explains why it provides a better solution.

I. PRECEDENT AND PHILOSOPHY

A. *Current Standards*

From 1923 to 1993, the *Frye* “‘general acceptance’ test [was] the dominant standard for determining the admissibility of novel scientific evidence.”⁷ The test draws the line for admissibility based on whether

¹ 509 U.S. 579 (1993).

² See, e.g., Margaret A. Berger, *Expert Testimony: The Supreme Court Rules*, ISSUES SCI. & TECH., Summer 2000, at 57, 58.

³ *Daubert*, 509 U.S. at 597.

⁴ *Id.* at 595.

⁵ 293 F. 1013 (D.C. Cir. 1923).

⁶ See Alice B. Lustre, Annotation, *Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts*, 90 A.L.R.5th 453, § 2, at 481 (2001).

⁷ *Daubert*, 509 U.S. at 585.

the scientific principle underlying the evidence is accepted by a sufficient portion of the relevant scientific community:

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.⁸

Thus, *Frye* requires the judge to determine the relevant scientific field and then to determine whether the members of that field have widely accepted the idea at issue. Prior to *Frye*, judges generally based admissibility upon an assessment of the expert rather than the testimony: experts needed to be qualified, and qualification was often based on whether an expert had success in the commercial marketplace.⁹

In *Daubert*, the Supreme Court held that the general acceptance doctrine was superseded by Rule 702 of the Federal Rules of Evidence: “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.”¹⁰ The Court also noted that Rule 702 applied to all scientific evidence rather than only to the novel evidence specified by the *Frye* opinion.¹¹ Elaborating on the specific inquiries required by the statute, the Court set out a two-part analysis:

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 (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 that reasoning or methodology properly can be applied to the facts in issue.¹²

⁸ *Frye*, 293 F. at 1014.

⁹ See David L. Faigman, Elise Porter & Michael J. Saks, *Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present, and Worrying About the Future of Scientific Evidence*, 15 CARDOZO L. REV. 1799, 1803–04 (1994); Michael J. Saks, *Judging Admissibility*, 35 J. CORP. L. 135, 136–37 (2009).

¹⁰ FED. R. EVID. 702 (1999) (amended 2000). Rule 702 was amended to add reliability requirements based in part on *Daubert*. See FED. R. EVID. 702.

¹¹ See *Daubert*, 509 U.S. at 592 n.11 (“Although the *Frye* decision itself focused exclusively on ‘novel’ scientific techniques, we do not read the requirements of Rule 702 to apply specially or exclusively to unconventional evidence.”).

¹² *Id.* at 592–93 (footnote omitted). The second prong addresses relevancy, which applies to all evidence under Rule 401. See FED. R. EVID. 401. It does not add requirements specific to scientific expert testimony. This Note’s discussion of the flaws of *Daubert* stems from the first prong.

So, unlike *Frye*, which essentially outsources admissibility determinations to scientific communities, *Daubert* tasks judges with separating good science from bad. To assist with this analysis, the Court suggested that judges could, but did not need to,¹³ consider four factors: testability; peer review and publication; rate of error and standards for operation; and general acceptance, as in *Frye*.¹⁴ Finally, the Court argued that the analysis would not confuse juries with newly admissible pseudoscience because of the sufficiency of traditional tools of the adversary system, such as cross-examination, contradictory evidence, burdens of proof, and directed or summary judgment; *Daubert* also would not stifle the search for truth by instituting a gatekeeping function for judges because law's need for finality and speed makes unlikely conjectures less useful than they would be in the scientific context.¹⁵

The two-part *Daubert* test remains current law for federal courts, requiring judges to assess both whether proposed testimony is scientific knowledge and whether that testimony has the appropriate fit with the facts of the case at hand. In two subsequent cases, *General Electric Co. v. Joiner*¹⁶ and *Kumho Tire Co. v. Carmichael*,¹⁷ the Court broadened the reach of trial judges under *Daubert* by insulating their decisions from review, allowing them to consider conclusions instead of only methodology, and extending the gatekeeping role to nonscientific evidence. In *Joiner*, the Court held that appellate courts should review trial judges' *Daubert* admissibility decisions under the abuse of discretion standard,¹⁸ and it concluded that the trial court could exclude testimony based on disagreement with the experts' interpretations of studies, rather than with their methods alone, since "conclusions and methodology are not entirely distinct from one another."¹⁹ In *Kumho Tire*, the Court extended the *Daubert* analysis beyond scientific evidence to the "technical" and "other specialized" knowledge also refe-

¹³ See David S. Caudill & Lewis H. LaRue, *Why Judges Applying the Daubert Trilogy Need To Know About the Social, Institutional, and Rhetorical — and Not Just the Methodological — Aspects of Science*, 45 B.C. L. REV. 1, 13–18 (2003) (emphasizing that "one should not focus obsessively on the list of four factors," *id.* at 14–15, because of the many caveats noted in the opinion and the implications of later Court opinions).

¹⁴ See *Daubert*, 509 U.S. at 593–94. The lower courts have emphasized these four factors despite the Court's caveat that they were "not . . . a definitive checklist or test." *Id.* at 593. Nevertheless, "many lower courts have tried to make a code of regulations out of a caricature version of the 'Daubert factors.'" D. Michael Risinger, *Goodbye to All That, or A Fool's Errand, by One of the Fools: How I Stopped Worrying About Court Responses to Handwriting Identification (and "Forensic Science" in General) and Learned To Love Misinterpretations of Kumho Tire v. Carmichael*, 43 TULSA L. REV. 447, 460 (2007).

¹⁵ See *Daubert*, 509 U.S. at 595–97.

¹⁶ 522 U.S. 136 (1997).

¹⁷ 526 U.S. 137 (1999).

¹⁸ See *Joiner*, 522 U.S. at 139.

¹⁹ *Id.* at 146.

renced in Rule 702.²⁰ The Court supported this conclusion by noting the lack of distinctions made in the statutory language, the equal grant of latitude in testimony to nonscientific experts, and the difficulty of distinguishing between “scientific” and “technical” or “other specialized” knowledge.²¹ The Court specified that trial courts may consider the four factors suggested by *Daubert* in these nonscientific contexts.²²

The most recent development in federal admissibility analysis occurred in 2000, when Rule 702 gained three reliability requirements:

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, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.²³

Some commentators assert that the revision to Rule 702 merely codified the holdings of *Daubert* and *Kumho Tire*,²⁴ while others believe that the new statute makes the admissibility requirements more stringent.²⁵

State courts are divided, largely between the old *Frye* test and the *Daubert* test. Twenty-five states now use the *Daubert* analysis or a similar test, fifteen states and the District of Columbia still use the *Frye* test, six states have not rejected *Frye* but incorporate a *Daubert*-like analysis, and four states have developed their own tests.²⁶

²⁰ See *Kumho Tire*, 526 U.S. at 141 (internal quotation marks omitted).

²¹ See *id.* at 147–48 (internal quotation marks omitted).

²² See *id.* at 149–50 (“Petitioners ask more specifically whether a trial judge determining the ‘admissibility of an engineering expert’s testimony’ may consider several more specific factors that *Daubert* said might ‘bear on’ a judge’s gatekeeping determination. . . . Emphasizing the word ‘may’ in the question, we answer that question yes.”).

²³ FED. R. EVID. 702.

²⁴ See Saks, *supra* note 9, at 144 n.53 (“Rule 702 essentially codified *Daubert* by adding three numbered clauses . . .”); Julie A. Seaman, *Triangulating Testimonial Hearsay: The Constitutional Boundaries of Expert Opinion Testimony*, 96 GEO. L.J. 827, 830 n.12 (2008) (noting that Rule 702 is “generally understood as codifying the *Daubert* test”).

²⁵ See Susan Haack, *Of Truth, in Science and in Law*, 73 BROOK. L. REV. 985, 991 (2008) (“[T]his revision went somewhat beyond simply articulating what, according to the *Daubert* Court, was already implicit in the original Rule 702; and some courts have understood the revised Rule as having tightened the *Daubert* standard.”); cf. David E. Bernstein, *Expert Witnesses, Adversarial Bias, and the (Partial) Failure of the Daubert Revolution*, 93 IOWA L. REV. 451, 452 (2008) (“An amendment to Federal Rule of Evidence 702 then codified a stringent interpretation of the ‘*Daubert* trilogy.’”).

²⁶ See Lustre, *supra* note 6, § 2, at 481 (surveying state case law through 2009). The four states with their own standards are Georgia, Utah, Virginia, and Wisconsin. Georgia requires the trial judge to determine whether a procedure or technique has reached a “scientific stage of verifiable certainty.” *Id.* § 50, at 543 (internal quotation marks omitted). Utah requires the trial court to determine whether the principles and techniques are “inherently reliable” and then whether they were properly applied by qualified experts. *Id.* § 51, at 544 (internal quotation marks omitted).

B. Frye, Daubert, and Philosophy of Science

Much of the discussion about admissibility centers upon philosophy of science²⁷ because distinctive treatment of scientific evidence hinges upon a belief that science differs significantly from other sources of evidence. The acceptance of the scientific community's word under *Frye* suggests a view of scientists as objective and science as universal truth. The expectation that judges assess science under *Daubert* suggests that scientists may not be trustworthy but that science, or at least the processes that satisfy the *Daubert* factors, is. This section offers a brief overview of relevant arguments from philosophy of science and concludes that courts should refrain from choosing among philosophies.

The predominant public view of science accepts science as “apolitical”²⁸ and sees natural science as a distinctive form of expertise “where questions have unique, precise and quantitative answers, not involving the subtle shades of judgment and nuances of personal experience that influence conclusions in other academic fields.”²⁹ Perhaps the most common articulation of this view of science is the set of norms proposed by Professor Robert Merton in his 1942 work, *The Normative Structure of Science*.³⁰ The Mertonian norms, also known as the CUDOS framework, include the following principles:

Communalism:³¹ knowledge is held in common by scientists;

Universalism: knowledge is independent of place and observer;

Disinterestedness: knowledge is free of interests;

Organized Skepticism: knowledge is questioned by peers.³²

ted). Virginia requires the trial court to determine “reliability through reliance on expert testimony.” *Id.* § 52, at 544. Wisconsin rejects any determination of reliability and instead uses a three-part test to determine relevance: “First, the court determines whether the evidence is relevant; second, whether the witness qualifies as an expert; and third, whether the evidence will assist the trier of fact.” *Id.* § 53, at 544.

²⁷ See Robert Robinson, *Daubert v. Merrell Dow Pharmaceuticals and the Local Construction of Reliability*, 19 ALB. L.J. SCI. & TECH. 39, 44 (2009) (“Much of the legal literature regarding admissibility is geared towards normative discussions about the philosophy of science, institutional arguments about the courts’ ability to assess expert testimony, and the abstract merits and deficiencies of particular admissibility regimes.”).

²⁸ Harvey Brooks, *Issues in High-Level Science Advising*, in SCIENCE AND TECHNOLOGY ADVICE TO THE PRESIDENT, CONGRESS, AND JUDICIARY 51, 52 (William T. Golden ed., 2d ed. 1993) (internal quotation marks omitted).

²⁹ *Id.* at 62.

³⁰ Robert K. Merton, *A Note on Science and Technology in a Democratic Order*, 1 J. LEGAL & POL. SOC. 115 (1942) reprinted as *The Normative Structure of Science*, in THE SOCIOLOGY OF SCIENCE 267 (1973).

³¹ Professor Merton originally used the term “communism,” but “communalism” is often used instead.

³² See Merton, *supra* note 30.

Universalism is a facet of the broader concept of scientific realism: the view that science generates truth, or in a more careful statement, “the view that mature and genuinely successful scientific theories should be accepted as nearly true.”³³ The *Frye* test seems based upon this vision of science as immune to social pressures and fully objective. In essence, the *Frye* test instructs courts to take scientists at their word — under *Frye*, evidence acceptable to scientists is acceptable to courts as well. This wholesale adoption of standards from a different field appears due largely to a belief that science provides exceptional assistance in determinations of truth.

Recent assessments of science question both the CUDOS view of the scientific community and the ability of science to discover truth. The emerging prominence of “Mode 2” science — in which research occurs with particular and usually commercial applications in mind, exists outside of the frameworks of traditional scientific disciplines, and is judged at least in part on utility — has embedded science more deeply in society and threatened the communal nature of knowledge by decreasing openness.³⁴ The other three CUDOS tenets are challenged by consideration of various social factors, such as the influence of theoretical beliefs on experiment choice, design, and analysis; scientists’ ability and training; scientists’ political and personal values; institutional and material support; and cultural or social biases.³⁵ Professor Paul Feyerabend argues in *Against Method* that science cannot even be tied to a particular methodology, as historical developments in science have not followed a consistent methodology.³⁶ In terms of the truth-generating function of science, instrumentalists have challenged the scientific realist view. Prominently, Professor Thomas Kuhn doubts realism in *The Structure of Scientific Revolutions*, which frames the history of science as a series of cycles in which the adoption of a central paradigm is followed by the “normal science” of puzzle solving surrounding that paradigm until enough anomalous results occur to precipitate a crisis and a resultant paradigm shift;³⁷ furthermore, movement to a new paradigm does not bring science closer to truth.³⁸

Given this disagreement among sociologists and philosophers of science, it is unsurprising that courts’ views of science are confused.

³³ STATHIS PSILLOS, SCIENTIFIC REALISM xv (1999).

³⁴ See Sheila Jasanoff, *Transparency in Public Science: Purposes, Reasons, Limits*, LAW & CONTEMP. PROBS., Summer 2006, at 21, 23–24.

³⁵ See David S. Caudill & Richard E. Redding, *Junk Philosophy of Science?: The Paradox of Expertise and Interdisciplinarity in Federal Courts*, 57 WASH. & LEE L. REV. 685, 704–05 (2000).

³⁶ See generally PAUL FEYERABEND, AGAINST METHOD (1975).

³⁷ See THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 5–6 (3d ed. 1996).

³⁸ See *id.* at 170.

Daubert attempts to incorporate some of the more critical views of science by deemphasizing general acceptance by scientific communities,³⁹ noting that publication does not always correlate with reliability, and observing that innovative theories and those with limited interest may not be published despite solid methodology.⁴⁰ However, *Daubert* has, at best, a conflicted philosophy of science.⁴¹ In explaining the “scientific knowledge” requirement, the opinion states that the requirement exists to seek “*evidentiary* reliability — that is, trustworthiness. In a case involving scientific evidence, *evidentiary reliability* will be based upon *scientific validity*.”⁴² Thus, the opinion falls back on the view of science as lacking subtle shades of judgment, equating “scientific” with “reliable.”⁴³ In addition, the Court bases the testability *Daubert* factor on the idea of falsifiability.⁴⁴ Yet, not only has falsifiability fallen out of favor in current discussions of philosophy of science,⁴⁵ but the Court also appears to conflate two distinct philosophies by citing both Carl Hempel and Karl Popper in support of the testability factor:⁴⁶ while Popper believed that only falsifiability — and never verification of the truth — was possible, Hempel disagreed and believed that testability could also assist in confirming particular theories.⁴⁷ The Court’s confusion and the disagreement among philosophers suggest that it is unreasonable to ask judges to determine the “best” philosophy of science that should guide their opinions.

II. DETERMINING THE TRUTH IN LAW VERSUS SCIENCE

Even if it were possible to determine the best philosophy of science, it is not clear that courts should rely on principles of that philosophy to

³⁹ See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 594 (1993).

⁴⁰ See *id.* at 593.

⁴¹ See Robinson, *supra* note 27, at 57–58 (“On epistemology, *Daubert* is simply ambiguous. . . . *Daubert*’s epistemology thus appears to be a mix of realism and constructivism, though more as the result of ‘muddling through’ than a deliberate choice by the majority.”); cf. A. Leah Vickers, *Daubert, Critique and Interpretation: What Empirical Studies Tell Us About the Application of Daubert*, 40 U.S.F. L. REV. 109, 121 (2005) (“*Daubert* has been criticized for incorporating a faulty philosophy of science.”).

⁴² *Daubert*, 509 U.S. at 590 n.9 (citations omitted). “[S]cientists typically distinguish between ‘validity’ (does the principle support what it purports to show?) and ‘reliability’ (does application of the principle produce consistent results?).” *Id.*

⁴³ See Susan Haack, *Trial and Error: The Supreme Court’s Philosophy of Science*, 95 AM. J. PUB. HEALTH (Supp. 1) S66, S68 (2005) (internal quotation marks omitted).

⁴⁴ See *Daubert*, 509 U.S. at 593.

⁴⁵ See Robinson, *supra* note 27, at 48 n.27; *id.* at 74 n.157.

⁴⁶ See *Daubert*, 509 U.S. at 593.

⁴⁷ See Jason Borenstein, *Science, Philosophy, and the Courts*, 13 ST. THOMAS L. REV. 979, 996 (2001) (“It is ironic that the Supreme Court latched onto Popper’s philosophy, because he explicitly denied that theories can be verified. . . . Hempel explicitly criticized Popper’s views on falsifiability.”); Haack, *supra* note 43, at S66–S68.

determine how to make legal judgments. On the surface, it appears that the purposes of evidence and science are closely aligned. Like science, evidence is intended as a tool in the search for truth: “[E]vidence signifies that which demonstrates, makes clear, or ascertains the truth of the very fact or point in issue.”⁴⁸ The definition of relevant evidence in Federal Rule of Evidence 401 — “evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence”⁴⁹ — indicates a similar purpose.

It may be “interesting to see that one . . . view in philosophy of science arguably recommends *Daubert* — at least as a philosophy of science! But *Daubert* is not supposed to be a methodological handbook for good science; it is supposed to set out a standard for good adjudication.”⁵⁰ Norms developed in the scientific context, and applied to establish scientific results, will not necessarily produce optimal legal determinations. Proponents of the *Frye* and *Daubert* tests need to show that admitting evidence based upon general acceptance by a scientific community or scientific validity actually improves legal decisionmaking. However, a number of factors suggest that adopting scientific standards will not bring the desired increase in accuracy and may undermine other goals of the law.

A. Accuracy and Competence

Even assuming that courtroom science should somewhat reflect real science, the admissibility standard should account for limitations of legal decisionmakers and decisionmaking processes.⁵¹ Professor Brian Leiter has argued that admissibility rules should be designed with two principles in mind: (1) epistemic paternalism, which in this context “entails designing rules of evidence that are epistemically best for jurors, i.e. that lead them to form true beliefs about disputed matters of fact”;⁵² and (2) “ought implies can,” which asserts that anything a rulemaker states should be done must be possible in the real world.⁵³

Both *Frye* and *Daubert* create concerns related to epistemic paternalism. By tying legal reliability to scientific acceptance or scientific

⁴⁸ 3 WILLIAM BLACKSTONE, COMMENTARIES *367; see also *State v. Aime*, 220 P. 704, 707 (Utah 1923) (“The purpose of evidence is to establish the truth in legal tribunals, in order that justice may be done. . . . In determining the competency of evidence, the essential test is its credibility and its value in discovering the truth.”).

⁴⁹ FED. R. EVID. 401.

⁵⁰ Brian Leiter, *The Epistemology of Admissibility: Why Even Good Philosophy of Science Would Not Make for Good Philosophy of Evidence*, 1997 BYU L. REV. 803, 817.

⁵¹ See *id.* (“[T]his goal [of aligning evidence with scientific practice] must be pursued in light of the serious epistemic limits of courts — intellectual, temporal, material.”).

⁵² *Id.* at 814.

⁵³ See *id.* at 815.

validity, courts may actually reduce the accuracy of triers of fact. On a systemic level, limiting the evidence seen by triers of fact has the side effect of “reducing the variability and dynamism across cases[, which] severely limits the opportunities for adversarial testing of diverse scientific evidence and experts across cases and over time . . . [and] also entrenches in law the established power structures and majoritarian biases in science.”⁵⁴ Thus, following the standards of science in law may propagate errors made by the scientific community.

On the level of individual cases, *Frye* and *Daubert* cause courts to skew the information given to juries, diminishing their ability to weigh equally reliable evidence in an equal manner. *Frye* and the practice, if not the theory, of *Daubert* reduce the accuracy of factfinders by allowing courts to grandfather in old, unproven techniques. *Frye* builds this grandfathering into its assessments by allowing any “well-recognized” form of evidence.⁵⁵ Although the *Daubert* test is nominally free of such restrictions, courts applying *Daubert* regularly permit unproven methodologies. Most prominently, courts often admit various types of matching analysis, which involve experts confirming that a particular sample — of handwriting, hair, fingerprints, bite marks, voice recordings, and so on — matches another sample.⁵⁶ More broadly, courts not only grandfather in unsupported techniques, but also often fail to recognize, as Professor Frederick Schauer has argued, that determinations of whether a type of evidence will improve the accuracy of decisions

⁵⁴ Caudill & Redding, *supra* note 35, at 750.

⁵⁵ *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

⁵⁶ See, e.g., Erica Beecher-Monas, *Blinded by Science: How Judges Avoid the Science in Scientific Evidence*, 71 TEMP. L. REV. 55, 56 & n.11 (1998) (“The problem in criminal evidence is that hair identification, bitemark analysis, voice spectrography, handwriting analysis, and even such time-honored prosecutorial tools of identification as fingerprinting, have crept into court with virtually no demonstration of their scientific bases.” *Id.* at 56.); Simon A. Cole, *Fingerprinting: The First Junk Science?*, 28 OKLA. CITY U. L. REV. 73, 75 (2003) (“Fingerprint evidence has emerged . . . as evidence that is not science.”); Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Rulings from Jennings to Llera Plaza and Back Again*, 41 AM. CRIM. L. REV. 1189, 1195–96 (2004) (arguing that forensic fingerprint experts have never proven their ability to match latent prints to particular fingers); Jane Campbell Moriarty, “*Misconvictions*,” *Science, and the Ministers of Justice*, 86 NEB. L. REV. 1, 10–12 (2007); Jane Campbell Moriarty & Michael J. Saks, *Forensic Science: Grand Goals, Tragic Flaws, and Judicial Gatekeeping*, JUDGES’ J., Fall 2005, at 16, 25 (“Assertions of near-perfect accuracy had to be tempered in the face of proficiency testing results showing spectrographic voice identification error rates as high as 63 percent; handwriting error rates ranging as high as 100 percent (though the more realistic rate of errors appears to be nearly 40 percent); false positive error rates for bite marks as high as 64 percent; tool-mark identification errors as high as 35 percent; and as many as one-quarter of fingerprint examiners failing to correctly identify all latent prints in a typical proficiency test. . . . [T]hese tests probably understate the actual error rate in everyday casework.”); Michael J. Saks, *Protecting Factfinders from Being Overly Misled, While Still Admitting Weakly Supported Forensic Science into Evidence*, 43 TULSA L. REV. 609, 617–20 (2007).

depend upon the types of evidence that would otherwise be used.⁵⁷ Thus, if a particular methodology is insufficiently tested or too inaccurate to be accepted by the relevant scientific community, it may still be beneficial to admit it if the alternative — such as eyewitness testimony not subject to the requirements of Rule 702 — is even less accurate.

Frye faces less of a problem with the “ought implies can” principle, given that it relies on a single, relatively simple assessment of general acceptance, which may require little in the way of special training to determine.⁵⁸ However, *Daubert* may not be realistically implementable. Although the Justices joining the majority opinion of *Daubert* were “confident that federal judges possess the capacity to undertake this review,”⁵⁹ numerous commentators have expressed doubt on this issue, arguing that the review required by *Daubert* analysis falls outside of judges’ competence.⁶⁰ The capacity of trial court judges to perform *Daubert* hearings has been called into question particularly by a study of four hundred state court judges likely to deal with such evidence. The study surveyed the judges and found that, although the vast majority of judges supported a judicial gatekeeping role, 96% had never received training about general scientific methods or principles; that 48% felt their education left them unprepared to deal with likely scientific evidence; and that, although 82% understood the *Frye* general acceptance standard and 71% understood peer review, only 6% understood falsifiability and only 4% understood error rate.⁶¹

In addition, judges likely suffer from a number of cognitive failings. Given the expectation that scientific truth is objective and absolute, it may be difficult for judges to believe that no firm truth exists on the scientific matter at issue. Yet the pressures of class-action cases and statutory limits push plaintiffs’ lawyers to bring cases before firm

⁵⁷ See Frederick Schauer, *Can Bad Science Be Good Evidence? Lie Detection, Neuroscience and the Mistaken Conflation of Legal and Scientific Norms*, 95 CORNELL L. REV. (forthcoming 2010) (manuscript at 29–31, on file with the Harvard Law School Library) (stating that juror assessment of witness testimony uses “alleged indicators of veracity [that] are at best highly unreliable, and at worst totally random,” *id.* at 29–30, and arguing that this context makes it plausible that fMRI evidence, while far from perfect, could nevertheless increase accuracy).

⁵⁸ See Leiter, *supra* note 50, at 818–19.

⁵⁹ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 593 (1993).

⁶⁰ See *id.* at 600 (Rehnquist, C.J. concurring in part and dissenting in part) (“I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its ‘falsifiability,’ and I suspect some of them will be, too.”); see also Caudill & Redding, *supra* note 35, at 750 (noting general lack of scientific expertise in judges and juries); David L. Faigman, *Is Science Different for Lawyers?*, 297 SCIENCE 339, 340 (2002) (“Judge Crow’s statement [that the worth of scientific methods can be ascertained by their use in courts] is remarkable for both its candor and its utter failure to appreciate the culture attending scientific testing of hypotheses.”); Janet Raloff, *Benched Science*, 168 SCI. NEWS 232, 233 (2005) (noting that scholars and a study suggest that judges do not understand science).

⁶¹ See Sophia Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433 (2001).

scientific bases exist: “If you wait for the science to develop, someone else will have been there first.”⁶² Thus, these early filings of claims often mean that insufficient research has occurred to prove or disprove causality, making false the common assumption by judges that the facts of causality exist somewhere in the scientific literature and further limiting judges’ abilities to perform the gatekeeping role.⁶³ Additionally, cognitive research suggests that judges may “overestimate their own ability to assess facts [and] their capacity to rise above the cognitive failings of lesser mortals.”⁶⁴ Judges may therefore underestimate the effect that biases may have on their admissibility decisions.

B. Conflicts with the Non-Accuracy Goals of Law

1. *Fairness.* — The current standards of admissibility raise fairness concerns about bias in favor of the more affluent party. First, *Daubert* hearings are often costly, and wealthier parties may use them to make litigation prohibitively expensive.⁶⁵ Second, both judges and scientific reviewers consider post-litigation studies more biased, and so less admissible, than pre-litigation studies because post-litigation studies have a predetermined outcome in mind.⁶⁶ However, corporate-sponsored pre-litigation studies suffer from the same problem because of the effects of funding on research outcomes: even if defendant companies do not explicitly hide negative results of studies, there is a correlation between positive results and financial relationships to corporations, as well as a negative correlation between criticism and any financial relationship.⁶⁷ Third, and adding to this effect, science and law treat error types differently: law tends to be indifferent between false positives and false negatives, while many scientific studies seek to limit false positives, permitting more false negatives and creating a bias in tort cases against finding causality.⁶⁸

⁶² Richard Monastersky, *Courting Reliable Science*, 153 SCI. NEWS 249, 250 (1998) (internal quotation mark omitted).

⁶³ Raloff, *supra* note 60, at 233.

⁶⁴ Frederick Schauer, *On the Supposed Jury-Dependence of Evidence Law*, 155 U. PA. L. REV. 165, 190 (2006).

⁶⁵ See Michelle M. Mello & Troyen A. Brennan, Commentary, *Demystifying the Law/Science Disconnect*, 26 J. HEALTH POL. POL’Y & L. 429, 434 (2001) (describing *Daubert* hearings as “a hallmark of mass tort litigation, used by relatively well-heeled defendants to increase the costs of litigation for plaintiffs”); Wendy E. Wagner, *Importing Daubert to Administrative Agencies Through the Information Quality Act*, 12 J.L. & POL’Y 589, 607 (2004) (“*Daubert* has been criticized for causing greater imbalance in adversarial processes because of the high costs associated with mounting and defending *Daubert* challenges.”).

⁶⁶ Sheila Jasanoff, *Law’s Knowledge: Science for Justice in Legal Settings*, 95 AM. J. PUB. HEALTH (Supp. 1) S49, S55 (2005).

⁶⁷ See Sheldon Krinsky, *The Funding Effect in Science and Its Implications for the Judiciary* 58–59 (Mar. 7, 2005) (unpublished manuscript, on file with the Harvard Law School Library).

⁶⁸ See Vickers, *supra* note 41, at 122–23.

The *Frye* and *Daubert* restrictions on admissibility also may create biases against criminal defendants. One scholar argues that “almost regardless of the quality of the science, judges are more likely to admit scientific evidence when it is pro-prosecution, and to exclude it when it is pro-defense.”⁶⁹ The grandfathering in of inaccurate but traditional methodologies often used to confirm guilt and the common exclusion of expert testimony about the flaws of eyewitness identification⁷⁰ suggest that current standards do not treat parties equally.

2. *Conflicting Cultures and Values.* — More fundamentally, one may question whether acceptance by the scientific community or reliability under scientific standards is an appropriate standard for use in legal contexts because of the disparate functions of legal and scientific factfinding. The former “develops knowledge as an aid to doing justice in a particular case; . . . [the latter] seeks truths that are, as far as possible, detachable from their context of production.”⁷¹ Indeed, law and science take a number of different views on the determination of truth. At a structural level, the judicial system typically relies on zealous advocacy — within certain ethical bounds — to reach conclusions, while the scientific community tends to follow an organized skepticism model based on critical peer review.⁷² At a more detailed level, science and law treat causation differently:

The law demands certainty and finality and generally forces its participants to render decisions and verdicts in binary pairs, such as causation/no causation and liability/no liability, even where evidence is ambiguous, uncertain, complex, and immature. In contrast, the scientific enterprise generally embraces probability and uncertainty and does not require the occasionally premature dichotomization of outcomes often required by the courts.⁷³

As such, much recent scholarship “addresses the conflicting cultures of science and the law and asks whether applying the scientific community’s best description of good science to evidence presented in a court of law necessarily and undesirably entails importing scientific values into the judicial sphere.”⁷⁴ These critiques of current standards argue that the goal of the admissibility standards — more accurate

⁶⁹ Susan D. Rozelle, *Daubert, Schaubert: Criminal Defendants and the Short End of the Science Stick*, 43 TULSA L. REV. 597, 606 (2007).

⁷⁰ See *id.* (“The science behind fingerprint and tool mark evidence is notoriously bad, and yet it is routinely admitted. The science behind eyewitness identification limitations is beyond reproach, and yet it is routinely excluded. And the obvious alternative explanation — that the meaningful variable is hard versus soft science, rather than pro-prosecution versus pro-defense — is belied by courts’ eagerness to admit evidence of the soft, lousy science of future dangerousness.”).

⁷¹ Jasanoff, *supra* note 66, at S50.

⁷² See Krinsky, *supra* note 67, at 47–48.

⁷³ Vickers, *supra* note 41, at 124 (footnote omitted).

⁷⁴ *Id.* at 122.

scientific information as judged by the standards of the scientific community — may not be appropriate in the legal setting: “Is doing justice to science, which was *Daubert*’s main preoccupation, consistent with the law’s primary function of doing justice for society?”⁷⁵ Scientific standards may not lead to more universal or disinterested results when applied to the specific, limited, real-world facts of cases.

III. A PROPOSAL FOR ADMISSIBILITY

Given the concerns raised above, admissibility standards for expert testimony deserve additional thought and revision. Many commentators have suggested alternatives to admissibility standards, such as bypassing the adversary system to present scientific issues to scientist courts;⁷⁶ educating law students and judges on science issues;⁷⁷ forming collaborations between scientific and legal institutions;⁷⁸ using court-appointed science experts in judicial proceedings;⁷⁹ and reforming forensic science practices themselves.⁸⁰ These alternatives are beyond the scope of this Note, but many could be used in tandem with the proposal offered here. This Note suggests that legislatures should repeal Rule 702 and similar state evidentiary rules and that courts should decide admissibility solely upon relevance, removing the acceptance and reliability considerations emphasized since *Frye*. Because this change will lead to increased admission of evidence for consideration by juries, judges should instruct juries on various factors related to reliability before the introduction of any type of evidence.⁸¹ Addi-

⁷⁵ Jasanoff, *supra* note 66, at S56.

⁷⁶ See Anthony Champagne, Daniel W. Shuman & Elizabeth Whitaker, *The Problem with Empirical Examination of the Use of Court-Appointed Experts: A Report of Non-Findings*, 14 BEHAV. SCI. & L. 361, 362 (1996).

⁷⁷ See Haack, *supra* note 43, at S70–S71; Raloff, *supra* note 60, at 233–34.

⁷⁸ See Stephen Breyer, *Introduction* to FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 1, 5–7 (2d ed. 2000).

⁷⁹ Joe S. Cecil & Thomas E. Willging, *Court-Appointed Experts*, in FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 525, 537 (1st ed. 1994) (reporting results from a survey of judges that found that eighty-seven percent believed in the potential usefulness of court-appointed experts).

⁸⁰ Worries about scientific evidence in the British system traditionally have been assuaged through reforms of forensic science practices, rather than through stricter admissibility standards. See David E. Bernstein, *Junk Science in the United States and the Commonwealth*, 21 YALE J. INT’L L. 123, 170–73 (1996).

⁸¹ This type of instruction was briefly suggested in Joel D. Lieberman & Bruce D. Sales, *What Social Science Teaches Us About the Jury Instruction Process*, 3 PSYCHOL. PUB. POL’Y & L. 589, 610 (1997). Note that jury instructions could be added on to the current admissibility standards as well. However, this Note argues that the movement from the *Frye* and *Daubert* admissibility standards to a solely relevance-based inquiry will not significantly damage accuracy and will improve the ability of trials to comport with legal goals. As such, it concludes that the change in admissibility standards along with the revision of jury instructions would be preferable to the revision of instructions by itself.

tional jury instructions will allow better assessment of the relative value of different pieces of evidence presented at trial by informing juries of specific problems with and reliability metrics for different types of evidence.

A. *The Proposal*

This proposal advocates moving to an admissibility standard based solely upon relevance and adding jury instructions. The repeal of Rule 702 and similar state rules would leave a relevance-only standard similar to the standard currently in place in Wisconsin, which omits any determination of reliability in admissibility decisions.⁸² *McCormick on Evidence* also supports a relevance-only standard: “[I]t has been suggested that . . . the traditional standards of relevancy and the need for expertise . . . should govern. [This] method for evaluating the admissibility of scientific evidence is the most appealing.”⁸³ Admissibility of scientific evidence in federal courts still would be governed, like all other evidence, by Rules 401, 402, and 403. Respectively, these rules define relevant evidence;⁸⁴ prohibit the admission of irrelevant evidence and set a default rule admitting relevant evidence;⁸⁵ and provide an exception allowing 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, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.”⁸⁶ Although moving to a relevancy standard would reduce the requirements for admissibility, it would still permit judges to exclude evidence because of emotional effects, information overload, or excessive time costs.⁸⁷

The jury instructions aspect of this proposal avoids resignation to the level of competence currently exhibited in the legal system. It counteracts some of the harm of dubious evidence by prefacing consideration of that evidence with warnings of its pitfalls. Model jury instructions for common forms of evidence — epidemiological studies, fingerprint analysis, eyewitness testimony — could help prevent variability and could reduce the uneven results caused by individual judges’

⁸² See Lustre, *supra* note 6, § 53, at 544–45. Wisconsin uses a three-part test to determine relevance: the trial court must determine relevance of the evidence, qualification of the expert, and assistance of the evidence to the trier of fact. *Id.*

⁸³ 1 KENNETH S. BROUN, MCCORMICK ON EVIDENCE § 203, at 833 (6th ed. 2006).

⁸⁴ FED. R. EVID. 401 (“‘Relevant evidence’ means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.”).

⁸⁵ See FED. R. EVID. 402.

⁸⁶ FED. R. EVID. 403.

⁸⁷ Cf. Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477, 1523 (1999).

discretion over *Daubert* hearings. Centralized creation of such instructions would also improve the efficiency of the process by preventing the parties and the judge from having to decide on fair and appropriate instructions in each case. These instructions could also be tailored to the particular factors most relevant for a particular type of evidence, relieving courts of the perceived need to apply the four *Daubert* factors in all cases.

The proposed instructions are similar to the *Telfaire* special jury instructions sometimes used to inform jurors about various conditions and factors that impact the reliability of eyewitness testimony.⁸⁸ Eyewitness identification has proven problematic;⁸⁹ in particular, psychological research has “compiled empirical evidence that incontrovertibly demonstrates a substantially greater rate of error in cross-racial recognition of faces,”⁹⁰ making errors more likely when the witness and the accused are of different races. In response to this evidence, an ABA report has recommended that when “identity is a central issue in a case tried before a jury, courts should consider exercising their discretion to use a specific instruction, tailored to the needs of the individual case, explaining the factors to be considered in gauging the accuracy of the identification.”⁹¹ The *Telfaire* instructions differ from this Note’s proposal in that they are typically used as a substitute for expert testimony about problems with eyewitness identification. However, instructions can also serve as a complement to such testimony,⁹² and using the two methods together would resolve some of the arguments raised against the *Telfaire* instructions, namely that “jury instructions lack the flexibility and specificity of expert testimony.”⁹³

⁸⁸ The *Telfaire* instructions are derived from *United States v. Telfaire*, 469 F.2d 552 (D.C. Cir. 1972), which included model jury instructions in an appendix to the opinion, *id.* at 558–59.

⁸⁹ See Elizabeth F. Loftus, *Eyewitness Testimony: Psychological Research and Legal Thought*, 3 CRIME & JUST. 105, 108 (1981) (“The problem can be stated rather simply: eyewitness testimony is not always reliable.”); Richard S. Schmechel et al., *Beyond the Ken? Testing Jurors’ Understanding of Eyewitness Reliability Evidence*, 46 JURIMETRICS J. 177, 205 (2006) (“[J]urors misunderstand how memory generally works and how particular factors, such as the effects of stress or the use of a weapon, affect the accuracy of eyewitness testimony.”); Innocence Project, Facts on Post-Conviction DNA Exonerations, <http://www.innocenceproject.org/Content/351.php> (last visited May 6, 2010) (stating that eyewitness misidentification “was a factor in 74 percent of post-conviction DNA exoneration cases”).

⁹⁰ Sheri Lynn Johnson, *Cross-Racial Identification Errors in Criminal Cases*, 69 CORNELL L. REV. 934, 936 (1984).

⁹¹ AM. BAR ASS’N CRIMINAL JUSTICE SECTION’S AD HOC INNOCENCE COMM. TO ENSURE THE INTEGRITY OF THE CRIMINAL PROCESS, ACHIEVING JUSTICE 24 (2006).

⁹² See Cindy J. O’Hagan, Note, *When Seeing Is Not Believing: The Case for Eyewitness Expert Testimony*, 81 GEO. L.J. 741, 754–55 (1993) (“Because expert testimony is a more effective solution, jury instructions should be used as a complement to the expert testimony, not as a substitute.”).

⁹³ Richard A. Wise, Kirsten A. Dauphinais & Martin A. Safer, *A Tripartite Solution to Eyewitness Error*, 97 J. CRIM. L. & CRIMINOLOGY 807, 833 (2007).

Although some have questioned the effectiveness of *Telfaire* instructions,⁹⁴ dismissing them seems premature, as existing studies are both few and narrowly focused on the model language set out in *Telfaire*. Furthermore, variations in *Telfaire*-like instructions concerning eye-witnesses have altered juror votes and beliefs about eyewitness evidence.⁹⁵ More broadly, techniques that make current jury instructions more effective should also be applicable to the proposed instructions — both types of instructions attempt to explain complex concepts in fields unfamiliar to the average jury member. Particular phrasing and avoidance of difficult linguistic constructions can improve juror understanding.⁹⁶ Empirical research has suggested that giving jurors instructions prior to trial and giving them written copies of instructions also aids comprehension.⁹⁷ Others have argued that jurors should be allowed to ask questions of judges or witnesses to improve comprehension.⁹⁸ Indeed, some commentators have argued specifically that these jury reforms will improve juror understanding of complex scientific evidence;⁹⁹ a study in which subjects watched a mock trial with con-

⁹⁴ See *id.* at 831–33.

⁹⁵ See Lisa Dufraimont, *Regulating Unreliable Evidence: Can Evidence Rules Guide Juries and Prevent Wrongful Convictions?*, 33 QUEEN'S L.J. 261, 305–307 (2008).

⁹⁶ See Robert P. Charrow & Veda R. Charrow, *Making Legal Language Understandable: A Psycholinguistic Study of Jury Instructions*, 79 COLUM. L. REV. 1306, 1331–40 (1979); Peter W. English & Bruce D. Sales, *A Ceiling or Consistency Effect for the Comprehension of Jury Instructions*, 3 PSYCHOL. PUB. POL'Y & L. 381, 383 (1997); Lieberman & Sales, *supra* note 81, at 623–26; Peter Tiersma, *The Rocky Road to Legal Reform: Improving the Language of Jury Instructions*, 66 BROOK. L. REV. 1081, 1118–19 (2001).

⁹⁷ See J. Alexander Tanford, *Law Reform by Courts, Legislatures, and Commissions Following Empirical Research on Jury Instructions*, 25 LAW & SOC'Y REV. 155, 157 (1991). The article also notes that courts and legislatures have been slow to implement these reforms, though legal commissions have done so more readily. See *id.* at 167. Another commentator has gone beyond suggesting written copies of instructions to advocate for informative illustrations to accompany jury instructions. See Firoz Dattu, *Illustrated Jury Instructions: A Proposal*, 22 LAW & PSYCHOL. REV. 67 (1998).

⁹⁸ See Phoebe C. Ellsworth & Alan Reifman, *Juror Comprehension and Public Policy: Perceived Problems and Proposed Solutions*, 6 PSYCHOL. PUB. POL'Y & L. 788, 804 (2000) (describing studies in which jurors “who requested and received help from the judge performed better on substantive, but not procedural, questions about the law” and explaining that “questioning witnesses is helpful to jurors in part because it clarifies complicated legal issues”); Larry Heuer & Steven Penrod, *Juror Notetaking and Question Asking During Trials: A National Field Experiment*, 18 LAW & HUM. BEHAV. 121, 148–49 (1994) (“[T]he results from this experiment mildly support the proposition that juror questions aid jury decision making and provide a strong basis for rejecting a host of postulated disadvantages of both the notetaking and question-asking procedures”); Nancy S. Marder, *Bringing Jury Instructions into the Twenty-First Century*, 81 NOTRE DAME L. REV. 449, 501–02 (2006) (arguing that jurors should be permitted to ask judges questions about instructions).

⁹⁹ See Robert D. Myers, Ronald S. Reinstein & Gordon M. Griller, *Complex Scientific Evidence and the Jury*, 83 JUDICATURE 150, 151–52 (1999) (arguing that juries dealing with complicated scientific evidence, such as genomic evidence, will need to be assisted by jury reforms to enhance their learning ability). The authors suggest that the use of independent experts or pre-recorded lectures to instruct jurors on the basics of various types of scientific evidence would be

flicting expert testimony found that jury reforms improved juror comprehension of mitochondrial DNA evidence.¹⁰⁰ Although development of particular proposed language is beyond the scope of this Note, previous research indicates that following these principles will help jurors spot less reliable claims and weigh them accordingly.

B. Accuracy and Competence

This Note's proposal improves upon *Frye* and *Daubert* on grounds of both epistemic paternalism and the "ought implies can" principle. As shown above, the exclusion of evidence under current standards raises concerns about epistemic paternalism: it may entrench scientists' errors and may distort the testimony that reaches the jury by excluding equally reliable evidence.¹⁰¹ Thus, the proposal permits consideration of testimony that may improve upon other evidentiary options despite its failure to meet the requirements of *Frye* or *Daubert*. The Rule 403 balancing of probative value with various costs will permit admissibility decisions to be context-based rather than methodology-based; evidence will be admitted when it is valuable, rather than when the process that created it meets particular standards.¹⁰² Exposure to additional expert testimony may force juries to confront the problems of forensic science more directly since only cases with clear scientific consensus will present only one scientific opinion.

The proposal at least rivals *Daubert* under the "ought implies can" principle, given the comparative ability of juries to assess scientific and technical evidence. Although the *Frye* test's delegation to the scientific community does harness greater skills of scientific interpretation, the comparison with *Daubert* is less clear, as it hinges on the difference between juries and judges. Many people may assume that judges possess greater capabilities given their higher level of education than that of the average juror,¹⁰³ but "there is reason to think that giv-

more helpful to jurors than cross-examination because jurors tend to doubt the flaws in scientific methodology exposed through cross-examination. *Id.* at 155–56. Jury instructions offer another method to convey this type of information in a neutral manner.

¹⁰⁰ See B. Michael Dann, Valerie P. Hans & David H. Kaye, *Can Jury Trial Innovations Improve Juror Understanding of DNA Evidence?*, 90 JUDICATURE 152, 153–55 (2007).

¹⁰¹ See *supra* pp. 2028–30.

¹⁰² See BROUN, *supra* note 83 § 203, at 835–37 ("Using a legal standard that recognizes that scientific validity and acceptance are matters of degree rather than yes-or-no judgments diminishes the severity of many of the problems that have plagued the general acceptance and scientific soundness standards. . . . [C]ourts and commentators have identified the varied considerations that determine the balance of probative value and prejudice of scientific evidence. Applying these to various types of scientific evidence offers a more honest and sensitive basis for making admissibility decisions than the more cramped tests that have characterized this area of the law of evidence." (footnote omitted)).

¹⁰³ See Schauer, *supra* note 64, at 188. Schauer also notes the absence of experiments that directly compare the abilities of judges and juries. *Id.*

ing complex scientific questions to the judge may not yield better or less arbitrary results than letting the jury decide the issue.”¹⁰⁴ As noted earlier, a survey of judges revealed that they lacked scientific training and failed to understand the *Daubert* factor concepts of falsifiability and error rate.¹⁰⁵ Although the survey did not include a comparison of jury capabilities and although it is unlikely that individual jurors would outperform judges, it is not clear that an individual judge would do better than a random group of twelve jurors, and “if some members of the juries had scientific or technical training, the odds of superior performance might be tipped in favor of the juries.”¹⁰⁶

Indeed, intuitions about the relative competence of judges and juries not only may overestimate judges’ capabilities, but also may underestimate the strengths of the jury:

There is reason to believe that in complex cases, a jury can be a better factfinder than a judge. A group can bring deeper and more diverse intellectual resources to a conceptually complex task. The advent of the one-day, one-trial jury system, which greatly increases the representativeness of the jury, may have tipped the balance even further in favor of juries. Once juries include engineers or accountants or even high school mathematics or science teachers, it is hard to imagine how the average judge would be able to understand the technical facts of a case better than the average jury.¹⁰⁷

A study of jury verdicts in medical negligence cases found that verdicts correlated with determinations of independent reviewing physicians and not with the severity of plaintiff injuries, suggesting that juries are reasonably competent.¹⁰⁸ In addition, an ABA study observing four trials dealing with complex and technological matters concluded that the juries in those trials generally achieved “reasoned verdicts” agreeing with judges’ opinions and logic, suggesting similar relative abilities.¹⁰⁹ Furthermore, “while a jury’s attention is focused on one trial, a judge may be distracted by other trials on the docket.”¹¹⁰ In sum, juries appear as able as judges to understand scientific evidence,

¹⁰⁴ Eugene Morgulis, Note, *Juror Reactions to Scientific Testimony: Unique Challenges in Complex Mass Torts*, 15 B.U. J. SCI. & TECH. L. 252, 277 (2009).

¹⁰⁵ See *supra* p. 2030.

¹⁰⁶ Neil Vidmar & Shari Seidman Diamond, *Juries and Expert Evidence*, 66 BROOK. L. REV. 1121, 1173 (2001).

¹⁰⁷ Michael J. Saks, *Do We Really Know Anything About the Behavior of the Tort Litigation System — And Why Not?*, 140 U. PA. L. REV. 1147, 1237 n.318 (1992) (citations omitted).

¹⁰⁸ See Ken Marcus Gatter, *The Continued Existence and Benefit of Medicine’s Autonomous Law in Today’s Health Care System*, 24 U. DAYTON L. REV. 215, 259–60 (1999).

¹⁰⁹ See SPECIAL COMM. ON JURY COMPREHENSION OF THE ABA SECTION OF LITIG., JURY COMPREHENSION IN COMPLEX CASES app. 2, at 83, app. 3, at 99–100, app. 4, at 66–67, app. 5, at 111–12 (1989).

¹¹⁰ Greg J. Michelson, Note, *Did the Markman Court Ignore Fact, Substance, and the Spirit of the Constitution in Its Rush Toward Uniformity?*, 30 LOY. L.A. L. REV. 1707, 1734 (1997).

implying that there would be no significant loss of competence when shifting from the *Daubert* test to the proposal.

C. Non-Accuracy Goals

In the American legal system, the goal of trials is to use the adversarial system to come to the correct conclusion while treating parties fairly and acting reasonably efficiently. Balancing these sometimes divergent goals is a complicated task, and so assessing the overall merits of different admissibility standards is complicated as well. Still, the proposal improves upon both *Frye* and *Daubert* because it is more consistent with the jury's role in the American adjudication system, because it mitigates inequities across classes of litigants, and because it keeps the law out of debates where it does not belong. Although it may impose some efficiency costs, these costs are justified.

Belief in the ability of the jury to assess complicated facts and conflicting, sometimes ill-founded arguments is central to the adversarial system.¹¹¹ Although one can argue for wholesale changes to eliminate juries or to replace adversarial trials with ostensibly more neutral judge-made and expert-consulted decisions,¹¹² within the current system, deviations from permitting the jury to weigh relevant information should be strongly justified.¹¹³ The traditional argument for gatekeeping in admissibility decisions is that juries need to be sheltered from junk science to prevent misinterpretation. It is true that the adversarial system can lead to the use of unjustifiable claims purporting to be scientific — as physics professor Robert Park cautions law students, “[T]he first rule you have to keep in mind is that there is no claim so

¹¹¹ See, e.g., Arthur R. Miller, *The Pretrial Rush to Judgment: Are the “Litigation Explosion,” “Liability Crisis,” and Efficiency Clichés Eroding Our Day in Court and Jury Trial Commitments?*, 78 N.Y.U. L. REV. 982, 1108 (2003) (“It is the very essence of the jury’s role to resolve factual ambiguity through inference or reasoning. This is the jury’s prerogative even when . . . the apparent lack of any basis for choosing between competing interpretations of the facts might appear to allow the jurors to speculate.”); *id.* at 1104 (“[I]t always has been within the jury’s province to listen to, weigh, accept, or reject expert testimony in a wide range of cases.”); cf. George Fisher, *The Jury’s Rise as Lie Detector*, 107 YALE L.J. 575, 577–78 (1997) (“We say that lie detecting is what our juries do best. In the liturgy of the trial, we name the jurors our sole judges of credibility and call on them to declare each witness truth-teller or liar. . . . [W]e usually do not ask jurors to judge the truthfulness of an out-of-court witness. But this general bar against hearsay is our only broad exception to the otherwise unqualified rule that leaves questions of credibility to the jury.”).

¹¹² Indeed, when nineteenth-century scientists in the British Association for the Advancement of Science considered the problem of conflicting expert testimony, they recommended eliminating civil juries from cases with technical aspects and establishing a new court system in which only a judge and skilled assessors would make decisions. See TAL GOLAN, *LAW OF MEN AND LAWS OF NATURE* 121–22 (2004).

¹¹³ See, e.g., Miller, *supra* note 111, at 1078–79; Austin Wakeman Scott, *Trial by Jury and the Reform of Civil Procedure*, 31 HARV. L. REV. 669, 672 (1918).

preposterous that a Ph.D. scientist cannot be found to vouch for it.”¹¹⁴ Yet, as argued above, juries appear no less skilled than judges at determining what scientific claims are reliable, undermining the *Daubert* test. And if any remaining accuracy advantage of *Frye* exists, it is defeated by other benefits of the proposal.

The proposal will provide the benefit of enhancing the jury’s democratic function. Beyond the purely truth-seeking factfinder role, the jury also possesses a representative role as “the most diverse of our democratic bodies”:¹¹⁵

It is [the] normative, value-based component of factfinding that cries out for a moral voice to be heard on what values will control in the context of a particular case. A deliberative democratic perspective would hand the task of voice expression to a group of ordinary citizens acting as community representatives . . . and charge them with deliberation. That is just what our system does by relying upon the jury. Indeed, empirical data suggests that just when the evidence is most unclear, then, as would be expected, jurors’ values come most strongly into play.¹¹⁶

This representative role of juries suggests that admission of additional evidence may help jurors make better determinations of when uncertainty exists so that they can then apply communal norms.¹¹⁷

Admitting a broader range of expert testimony would also alleviate biases, and it would do no worse than the current system in ensuring horizontal equity across litigants and courts. As implied earlier, a broader range of expert testimony would reduce biases in favor of corporate defendants and against criminal defendants.¹¹⁸ In addition, horizontal equity concerns raised by variation among juries appear no greater than the concerns raised by individual trial judges considering admissibility under *Daubert*, and such concerns should be reduced by the introduction of model jury instructions. Moreover, some variation is justifiable in that the relative quality and importance of evidence is context-specific — the proposal appears best able to deal with contextual differences, while *Daubert* may permit some consideration and *Frye* permits none. Divergence of local norms may justify additional

¹¹⁴ Robert L. Park, *Science in the Courts*, 36 NEW ENG. L. REV. 575, 576 (2002).

¹¹⁵ Laura Gaston Dooley, *Our Juries, Our Selves: The Power, Perception, and Politics of the Civil Jury*, 80 CORNELL L. REV. 325, 325 (1995); see also *id.* at 325–26 (“After courts began to interpret constitutional mandates of equal protection and impartial juries to require that women and minorities be included on juries, the demographics of juries changed dramatically at a pace far exceeding the diversification of legislatures, executive branches, or the judiciary.” (footnotes omitted)).

¹¹⁶ Andrew E. Taslitz, *Temporal Adversarialism, Criminal Justice, and the Rehnquist Court: The Sluggish Life of Political Factfinding*, 94 GEO. L.J. 1589, 1604 (2006).

¹¹⁷ This use of communal norms reaffirms that law and science respond to uncertainty in different ways.

¹¹⁸ See *supra* section II.B.1, pp. 2031–32.

variation — here the proposal again has the advantage, as juries are likely more representative of local values than are judges or scientists.

Moving to a standard based entirely on relevance would be beneficial in resolving some of the conflicting cultures and values of science and law. By removing the assessment of scientific standards, the proposal would avoid immersing the legal system in the debate over which philosophy of science is true, a question that seems unlikely to be resolved satisfactorily by courts, especially given the lack of consensus within the field of philosophy of science itself.¹¹⁹

Finally, in terms of judicial economy, although the proposal eliminates the sizeable costs of *Daubert* hearings,¹²⁰ the increased analysis performed by juries and the increased number of cases that will survive summary judgment likely will put a heavier burden on the legal system. However, as Professor Arthur Miller has argued:

[A]n unfettered commitment to “efficiency” in the pretrial disposition context . . . will erode other systemic values. To honor the rights to a day in court and to jury trial, the equation of the summary judgment and judgment as a matter of law standards demands that the pretrial disposition of cases . . . be closely scrutinized and constricted [I]nvocations of complexity or uniformity exceptions or assumptions as to efficiency and policy preferences . . . as rationales for limiting access to trial and jury adjudication must be cabined Taking decisionmaking authority from juries runs counter to basic and long-cherished principles of our system.¹²¹

Any additional burden on the jury will result from admission of evidence that is relevant and that may be more reliable than other types of evidence, such as eyewitness testimony, that are routinely admitted; the additional cases will result from parties’ new ability to use that evidence. These are burdens that the justice system should be willing to bear.

Thus, this proposal would improve upon current standards in a number of ways. The differences in competence between judges and juries are not great when assessing scientific information, and accurate interpretation of scientific evidence would be improved by the adoption of model jury instructions concerning reliability. Although the difference in scientific competence between juries and scientists is signifi-

¹¹⁹ See Robinson, *supra* note 27, at 75–76 (“I see little chance for the emergence of a consistent epistemological understanding of *Daubert*.”).

¹²⁰ See Melanie B. Leslie, *Liability for Increased Risk of Harm: A Lawyer’s Response to Professor Shafer*, 22 CARDOZO L. REV. 1835, 1839 (2001) (“Because both plaintiffs’ and defendants’ experts might have to testify twice (at the hearing and at trial), [*Daubert*] hearings greatly increase the costs of cases that go to trial.”); Wagner, *supra* note 65, at 607 nn.70–71 (reporting that *Daubert* hearings can last numerous days and can cost parties hundreds of thousands of dollars, which dissuades attorneys from accepting even meritorious cases).

¹²¹ Miller, *supra* note 111, at 1133–34. Like Miller, Professor Judith Resnik has questioned whether summary judgment yields efficiency gains. See Judith Resnik, *Managerial Judges*, 96 HARV. L. REV. 374, 380 (1982).

cant, this cost is overcome because the proposal will include relevant evidence that would assist triers of fact in reaching the most accurate results, will decrease the bias in favor of certain classes of litigants, and will reduce the confusion that results from applying scientific norms to legal evidence. Although it is likely that nothing can solve the problem of the conflicting norms that arise when science is introduced in the courtroom, moving to a solely relevance-based admissibility standard and adding jury instructions on reliability would improve upon the current system.