

IN DEFENSE OF SUFFICIENCY: A REPLY TO PROFESSOR
TWERSKI AND MR. SAPIR

Michael D. Green*

Joseph Sanders**

We welcome the chance to respond to Professor Twerski and Mr. Sapir's comments¹ on our article addressing the relationship between the sufficiency of scientific evidence and the admissibility of expert witness testimony.² Their comments provide us with an opportunity to clarify our position and to argue that we do not believe our proposal will necessarily eviscerate *Daubert*,³ as Twerski and Sapir fear.

The nub of the paper to which Twerski and Sapir respond is that the *Daubert* factors are largely inappropriate for determining the admissibility of a scientific expert's opinion on causation in a toxic tort case.⁴ The four factors set forth by Justice Blackmun in

* Professor Green received a J.D. from the University of Pennsylvania. He is the Williams Professor of Law at Wake Forest University and like Professor Sanders, he has published considerable material in the area of toxic torts.

** Professor Sanders received a J.D. and Ph.D from Northwestern University. He is the A.A. White Professor of Law at the University of Houston and has written numerous articles and books on toxic torts.

¹ See Aaron D. Twerski & Lior Sapir, *Sufficiency of the Evidence Does Not Meet Daubert Standards: A Critique of the Green-Sanders Proposal*, 23 WIDENER L.J. 641 (2014)

² See Michael D. Green & Joseph Sanders, *Admissibility Versus Sufficiency: Controlling the Quality of Expert Witness Testimony in the United States* (Wake Forest Univ. Sch. of Law Legal Studies Research Paper Series, Paper No. 2016468 & Univ. of Houston Law Ctr., Pub. Law and Legal Theory Research Paper Series, Paper No. 2016468), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2016468.

³ *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993).

⁴ *Daubert* was forged in the crucible of toxic torts – the case rested on the teratogenicity of Bendectin, a drug for morning sickness and was extended in *Kumho Tire Co. v. Carmichael* to all testifying experts. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999). We limit our assessment of *Daubert* to the toxic tort context.

*Daubert*⁵ have proved largely unhelpful in assessing the reliability of experts' work, and *Daubert*'s progeny have de-emphasized the role of those factors, adding to the admissibility assessment the connection between the data relied on by the expert and the strength of that data in supporting the expert's conclusions.⁶ Descriptively, we claim that courts are, in deciding admissibility, examining the scientific evidence identified by the expert in support of her opinion and assessing whether that evidence supports the expert's opinion in something close to what courts have long done in assessing the sufficiency of the evidence. Normatively, we applaud that move as we think that use of the *Daubert* factors does not provide an entirely coherent framework for assessing causation opinions in toxic torts.

We should begin by noting issues on which we and Twerski and Sapir agree. We agree that judges are less likely to overturn a jury verdict than they are to rule against the admissibility of an expert and as a consequence enter a summary judgment for the opposing side. Finally, we agree that given the extraordinary cost of litigation, one of the virtues of the "*Daubert* revolution" has been to permit screening cases at the pretrial process. As we explain below, although Twerski and Sapir critique our views, once we have the opportunity to clarify what we meant, we think there is even less disagreement.

We should clarify our argument where it seems that we have not been as precise as we should have been. It is not the case that we think the "*Daubert* factors" are always unhelpful. They may or may not be in a given case,⁷ although we think that in toxic tort cases they are mostly irrelevant to the analysis required.⁸ Our point, rather, is that in its subsequent opinions, the United States Supreme Court turned its attention away from these factors and toward the question of whether the expert's testimony, including her testimony on the ultimate causal question, is adequately supported by the data upon which the expert relies. This is the

⁵ *Daubert*, 509 U.S. at 589, 591, 593-94.

⁶ *Kumho Tire*, 526 U.S. at 146, 149-50.

⁷ This, of course, is the position the Supreme Court adopted in *Kumho Tire*. *Id.* at 158.

⁸ See Green & Sanders, *supra* note 2, at 15-20.

central idea behind *Daubert's* requirement that the expert have "good grounds"⁹ for her opinion and *General Electric Co. v. Joiner's*¹⁰ requirement that the chain of an expert's reasoning does not contain too great an analytical gap.¹¹ Moreover, *Kumho Tire Co. v. Carmichael*¹² teaches us that the analytical gap analysis should not occur in the abstract, but rather with respect to the case at hand.¹³ Indeed, this movement away from the factors and toward a good grounds-analytical gap approach to the expert testimony with respect to a given set of facts is, in our opinion, largely congruent with a sufficiency approach to expert testimony. We also claim, as a descriptive matter, that at least since *Joiner* and *Kumho Tire* the majority approach of courts employing *Daubert* to determine the admissibility of an expert's testimony on causation is to assess whether the data, the scientific evidence, proffered by the expert is sufficient to support the expert's reasoning to a causal opinion. If it is not, the expert's testimony is inadmissible.

As a descriptive matter of what courts are doing, we do not find in the Twerski-Sapir paper any attempt to dispute our account of how courts are employing *Daubert*.¹⁴ Nor do they point to cases, unlike the ones we use to support our account, that are usefully employing the *Daubert* factors to determine which expert's methodology and reasoning are sufficiently rigorous as to be admissible. Nor do we find in the Twerski-Sapir paper any disagreement with our assessment that the *Daubert* factors mostly do not fit an effort to assess the reliability of a causation expert's methodology and reasoning in reaching an opinion on causation.

So where does the disagreement lie, if indeed there is a disagreement at all? Twerski and Sapir are concerned that

⁹ *Daubert*, 509 U.S. at 590.

¹⁰ *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997).

¹¹ *Joiner*, 522 U.S. at 146.

¹² *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

¹³ *Id.* at 153.

¹⁴ Twerski and Sapir fairly summarize our claim: "They review a number of cases that they claim support their conclusion that courts have been deciding the admissibility of cutting-edge technological expert testimony on the issue of causation based on sufficiency of the evidence." Twerski & Sapir, *supra* note 1, at 645. Twerski and Sapir acknowledge that "[s]ome courts appear, in fact, to be doing what Green and Sanders describe." *Id.* at 641 n.5.

employing a sufficiency analysis to determine the admissibility of expert testimony will dilute the rigor of a *Daubert* analysis.¹⁵ The "formal" structure of *Daubert*, including apparently its four factors, will better keep frivolous or weak cases from being submitted to the jury. The crux of their concern seems to be in the high cost of false positive determinations of admissibility:

Once it is found that a given agent is a carcinogen or affects the autoimmune system of a human being, the implication is enormous. Hundreds, often thousands, of cases ride on the outcome, and billions of dollars may be at stake. The sufficiency standard utilized to determine whether a plaintiff has produced adequate evidence to survive summary judgment is, and always will be, minimal. The *Daubert* standard is anything but minimal.¹⁶

It appears that Twerski and Sapir are arguing that the costs of false positives (i.e., incorrect findings of causation for plaintiffs) outweigh the costs of false negatives (i.e., incorrect findings that causation does not exist). We are agnostic to that proposition. In their short essay, Twerski and Sapir did not have the opportunity to develop this idea. But we believe some elaboration on this point is warranted.

The classic legal response to the concerns Twerski and Sapir raise is with the burden of proof. The high burden of proof in criminal cases—beyond a reasonable doubt—reflects a societal belief that wrongfully convicting an innocent person is far more costly than incorrectly letting a guilty individual go free.¹⁷ By contrast, in civil cases the standard of proof is a preponderance of the evidence, understood to mean more likely than not.¹⁸ That standard reflects the conventional wisdom that erroneous judgments in favor of plaintiffs are of equal cost to erroneous rulings for defendants.¹⁹

¹⁵ *Id.* at 641-43.

¹⁶ *Id.* at 650-51 (footnotes omitted).

¹⁷ See Henry L. Chambers, Jr., *Getting It Right: Uncertainty and Error in the New Disparate Treatment Paradigm*, 60 ALB. L. REV. 1, 6-7 (1996).

¹⁸ See *id.* at 6.

¹⁹ See *id.* at 7.

There are two places in a toxic tort case where the standard of proof plays a role.²⁰ First, there is the admissibility determination.²¹ Second, there is the sufficiency stage.²² Twerski and Sapir think that their concern should be addressed at the time admissibility is addressed.²³

We should be clear that we do not seek to overturn the *Daubert* Court's decision to nest the admissibility analysis within Federal Rule of Evidence 104(a) rather than 104(b). "Under Rule 104(a) the judge must be convinced, by a preponderance of the evidence, that the scientific evidence is *valid*."²⁴ As Professor Faigman and his colleagues note, the Supreme Court might have chosen to have trial courts review admissibility determinations under Rule 104(b), which limits the judge's threshold examination to finding that a reasonable trier of fact could find the fact to be true.²⁵

On balance, however, it appears that *Daubert's* validity test is some distance from the most liberal rule the Court could have adopted. Rule 104(b) would have provided a much more generous reception to expert witnesses Rule 104(a) provides the strongest judicial check on the vagaries of scientific practice and the best safeguard against jurors being overwhelmed by those practices.²⁶

Admissibility rulings under 104(b) would be much closer to the type of review Twerski and Sapir fear, but we are not arguing for a movement toward this standard. Our goal is much more modest. Twerski and Sapir state that "[t]he test for reliability must

²⁰ See generally Twerski & Sapir, *supra* note 1, at 647-51 (discussing the standards of proof for admissibility and sufficiency).

²¹ See generally *id.* (discussing the admissibility determination).

²² See generally *id.* (discussing the sufficiency standard).

²³ See Twerski & Sapir, *supra* note 1, at 648.

²⁴ See David L. Faigman, et al., *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, 1817 (1994) (emphasis in original).

²⁵ See *id.*

²⁶ *Id.* at 1819.

stand on its own bottom."²⁷ With a slight modification, we agree. What must stand on its own bottom is the admissibility determination. Our modest goal is to argue that when courts make these admissibility determinations they often think about the issue in sufficiency-like ways and, moreover, that this is a good thing.

We would add that, to the extent that Twerski and Sapir seek a higher standard of proof for the admissibility determination, we know of no legal authority, including *Daubert* and its progeny, for such a variance. Indeed, the rule that developed in the wake of *Daubert* accepting a relative risk of slightly greater than 2.0²⁸ as sufficient proof of specific causation was based on a preponderance of the evidence standard.²⁹ Moreover, if the evil that *Daubert* was addressed to was the high cost of false positives in toxic tort cases, we would not have expected *Daubert* to be expanded to all expert testimony, whether about causation or not, and to non-toxic tort cases, as it was in *Kumho Tire*.³⁰

However, if the law were to accept the Twerski and Sapir argument that admissibility determinations should be more rigorous in the toxic tort context, the sufficiency approach we explain could readily accommodate greater stringency. Sufficiency of the evidence determinations must be made in light of the standard of proof.³¹

We may also be able to ease Twerski and Sapir's concern that a sufficiency approach requires only that there be "any evidence viewed in the light most favorabl[e] to plaintiff."³² First, the "any evidence" standard for sufficiency, which has long been out of favor, as the Supreme Court of the United States reminded federal

²⁷ Twerski & Sapir, *supra* note 1, at 649.

²⁸ The Ninth Circuit relied on this proposition on remand of the *Daubert* case from the Supreme Court of the United States. *See Daubert v. Merrell Dow Pharm., Inc.*, 43 F.3d 1311, 1314 (9th Cir. 1995); Michael D. Green et al., *Reference Guide on Epidemiology*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 549, 612 (3d ed. 2011)

²⁹ *See* Green et al., *supra* note 28, at 612.

³⁰ *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 (1999) ("We, like the parties, believe that [*Daubert*] applies to all expert testimony.").

³¹ *See Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 252 (1986) (providing that the clear and convincing standard applicable at trial must be taken into account by the judge in ruling on a motion for summary judgment).

³² Twerski & Sapir, *supra* note 1, at 649.

judges in one of the trilogy of its cases on summary judgment in 1986, that is widely understood as encouraging judges to more readily grant summary judgment:

'Nor are judges any longer required to submit a question to a jury merely because some evidence has been introduced by the party having the burden of proof, unless the evidence be of such a character that it would warrant the jury in finding a verdict in favor of that party. Formerly it was held that if there was what is called a *scintilla* of evidence in support of a case the judge was bound to leave it to the jury, but recent decisions of high authority have established a more reasonable rule, that in every case, before the evidence is left to the jury, there is a preliminary question for the judge, not whether there is literally no evidence, but whether there is any upon which a jury could properly proceed to find a verdict for the party producing it, upon whom the *onus* of proof is imposed.¹³³

Causation is a matter, as we explained in our paper, that is necessarily proved by circumstantial evidence.³⁴ Some circumstantial evidence is quite strong, as when a passenger in an automobile emerges from the car after a crash into a tree with a broken arm, while some circumstantial evidence is quite weak, as would be a handful of adverse case reports documenting the development of a common disease after taking a prescription drug.³⁵

³³ *Anderson*, 477 U.S. at 251 (quoting *Schuylkill & Dauphin Improvement Co. v. Munson*, 81 U.S. 442, 448 (1871)).

³⁴ See *Green & Sanders*, *supra* note 2, at 4.

³⁵ We note the universality of agreement on this matter. The Australian high court remarked, in a toxic tort case:

Lord Macmillan in *Jones v Great Western Railway Co* (1930) 47 TLR 39, in the context of stating that a possibility that a negligent act caused injury was not enough, said (at 45):

The dividing line between conjecture and inference is often a very difficult one to draw. A conjecture may be plausible but is of no

While credibility determinations are for the jury and all reasonable inferences must be resolved in favor of the party against whom judgment as a matter of law is sought,³⁶ determining whether circumstantial evidence constitutes a reasonable inference, and thus is a matter for the jury or whether it is sufficiently weak that it is categorized as speculation, thereby justifying screening the matter from the jury, is a matter for the court.³⁷ Thus, there may be circumstantial evidence that simply is not sufficiently strong to justify a reasonable inference of causation or other factual matters thereby justifying removing the case from the jury.³⁸ If they were acting as judges in a *Daubert* case, Twerski and Sapir might well require stronger scientific evidence to support an expert's causation opinion than others might. But, that difference among judges' perspectives, influenced by their commitment to, and confidence in the jury, has long existed.³⁹

Twerski and Sapir think that nomenclature matters. *Daubert* and its factors provide a "formal" structure that a sufficiency analysis does not.⁴⁰ While we are inclined to agree that

legal value, for its essence is that it is a mere guess. An inference in the legal sense, on the other hand, is a deduction from the evidence, and if it is a reasonable deduction it may have validity as legal proof. The attribution of an occurrence to a cause is, I take it, always a matter of inference.

Seltsam Pty Ltd. v. McGuinness; James Hardie & Coy Pty Ltd. v. McGuinness [2000] NSWCA 29 (Austl.).

³⁶ *O'Connor v. Pa. R.R. Co.*, 308 F.2d 911, 914 (2d Cir. 1962).

³⁷ *Green & Sanders*, *supra* note 2, at 10. ("[I]f plaintiff's evidence is circumstantial and requires too great an inference to justify a finding on the issue in dispute, the court will dismiss for failure to satisfy the burden of production.").

³⁸ See RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 3 & cmt. d (1998) (permitting the use of circumstantial evidence to prove the existence of defect and explaining when such an inference is appropriate and when it is not).

³⁹ See *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152-53 (1999) (explaining that judges enjoy wide latitude in making the initial determination about whether evidence shall be presented to the jury).

⁴⁰ Twerski & Sapir, *supra* note 1, at 642.

nomenclature can matter, we are dubious that it plays a substantial role in the *Daubert* context.⁴¹

Although there is no sure way to ascertain whether on average a court's use of the *Daubert* criteria produces more stringent admissibility rulings, there are many cases where this is not the case.⁴² Moreover, it is difficult to see how criteria that are inapplicable to the task at hand can constrain at all. And, that is our point with several of the *Daubert* criteria when applied to scientific evidence like epidemiology and toxicology. We see far too many opinions in which courts contort the *Daubert* factors beyond recognition to fit their intuitions about the strength of the scientific evidence bearing on causation.⁴³

We note that Twerski and Sapir's critical assessment of the scientific evidence in the Parlodel cases does not employ the *Daubert* factors.⁴⁴ They discuss the scientific evidence and explain why it is so weak that courts should not permit expert testimony of causation.⁴⁵ They conclude, after their analysis of the evidence, that the "reasoning or methodology underlying the testimony is [not] scientifically valid."⁴⁶ That standard provides, we think, little more constraint on judges than the sufficiency analysis we advocate.

Finally, we are not as certain as Twerski and Sapir appear to be that one can describe, *ex ante*, how high the admissibility or

⁴¹ We readily acknowledge that this is an empirical matter, and all we have to bring to that table at this point are our intuitions.

⁴² Indeed, sometimes the *Daubert* factors act as camouflage for lenient admissibility opinions. The most egregious examples come from the criminal law area. For example, in the fingerprint area, some courts have concluded that latent print evidence passes muster on the testing prong of *Daubert* because it is testable, although it has not been tested. *See* United States v. Mitchell, 365 F.3d 215, 238 (3d Cir. 2004); United States v. Sullivan, 246 F. Supp. 2d 700, 704 (E.D. Ky. 2003).

⁴³ We document a few of these in our paper. Green & Sanders, *supra* note 2, at 16 n.43; *see also* Susan Haack, *Federal Philosophy of Science: A Deconstruction – and a Reconstruction*, 5 N.Y.U. J. L. & LIBERTY 394, 422-24 (2010). There are far more in the reporters.

⁴⁴ Twerski & Sapir, *supra* note 1, at 656-58.

⁴⁵ *Id.* at 656-57.

⁴⁶ *Id.* at 658 (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 592-93 (1993)).

sufficiency threshold should be when the courts are presented with a given set of facts.⁴⁷ We have argued elsewhere that this threshold adapts depending on the quality of evidence reasonably available to the party with the burden of proof.⁴⁸ The law is rife with adaptations to the burden of proof when evidence is not reasonably available.⁴⁹ Traditionally, courts rebuffed efforts to use statistical evidence, such as they virtually demand today in toxic torts in the form of epidemiology.⁵⁰ The classic case reflecting this attitude is *Smith v. Rapid Transit, Inc.*⁵¹ The acceptance of epidemiologic evidence as proof of causation involved a substantial change in judicial attitudes about statistical evidence because better evidence of agent-disease causation is unavailable.⁵²

That is just one of many examples of the legal system's adaptation to difficulties of proof. To list a few with which we are most familiar, the courts that accepted market share liability did so because evidence of which drug manufacturer provided the DES

⁴⁷ *Id.* at 648-50.

⁴⁸ Joseph Sanders, *Applying Daubert Inconsistently?: Proof of Individual Causation in Toxic Tort and Forensic Cases*, 75 BROOK. L. REV. 1367, 1390-91 (2010).

⁴⁹ See RESTATEMENT (THIRD) OF TORTS: APPOINTMENT OF LIABILITY § 26 cmt. h (2000) (relaxing plaintiff's burden of production to prove damages when evidence about the extent of harm caused by multiple parties is unavailable). Perhaps the starkest example of adjusting the burden is the common tort principal of *res ipsa loquitur*, which shifts the burden to the defendant to rebut a presumption of negligence, when only he would have access to evidence of negligence. See Dale A. Nance, *Missing Evidence*, 13 CARDOZO L. REV. 831, 849 (1991).

⁵⁰ See Steve Gold, Note, *Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence*, 96 YALE L.J. 376, 379 (1986) ("The increasing use of statistical evidence as proof of toxic tort causation is largely a result of simple necessity.").

⁵¹ *Smith v. Rapid Transit, Inc.*, 58 N.E.2d 754, 755 (Mass. 1945) (rejecting statistical evidence); see also *Guenther v. Armstrong Rubber Co.*, 406 F.2d 1315, 1318 (3d Cir. 1969) ("[T]here was no justification for allowing plaintiff's case on that so-called probability hypothesis to go to the jury.").

⁵² Khristine L. Hall & Ellen K. Silbergeld, *Reappraising Epidemiology: A Response to Mr. Dore*, 7 HARV. ENVTL. L. REV. 441, 441-42 (1983) (arguing that epidemiologic studies are a legitimate means of showing causation in toxic tort cases).

that the plaintiff's mother took was unavailable.⁵³ Justice Traynor's famous concurrence in *Escola v. Coca Cola Bottling Co. of Fresno*,⁵⁴ advocated the adoption of strict products liability, in part, because of the difficulty plaintiffs had in proving a manufacturer's negligence.⁵⁵ The "substantially certain to result" alternative standard for intent⁵⁶ is justified, in part, by the difficulties of proving a defendant's purpose. *Res ipsa loquitur* sanctions use of generalized evidence for proof that, were good particularistic evidence available, we would not accept.⁵⁷ Indeed, that is why a defendant can defeat *res ipsa loquitur* by demonstrating that, in the particular instance involved, there was no negligence.⁵⁸ In the remedies arena in proving the magnitude of damages, the law only expects a plaintiff to provide proof with "as much certainty as the nature of the tort and the circumstances permit."⁵⁹ The sufficiency approach that compares the quality of the evidence supporting the plaintiff expert's conclusion, with the quality of the evidence on the other side, captures this reality and, we believe, will assist trial judges to better understand the task required of them by *Daubert*.

⁵³ See RESTATEMENT (THIRD) OF TORTS: PHYSICAL AND EMOTIONAL HARM § 28 cmt. p (2010).

⁵⁴ *Escola v. Coca Cola Bottling Co. of Fresno*, 150 P.2d 436 (Cal. 1944).

⁵⁵ *Id.* at 440-41 (Traynor, J., concurring).

⁵⁶ See RESTATEMENT (THIRD) OF TORTS: PHYSICAL AND EMOTIONAL HARM § 1(b) (2010).

⁵⁷ *Id.* § 17 & cmts. a, d.

⁵⁸ *Id.* § 17 cmt. g.

⁵⁹ RESTATEMENT (SECOND) OF TORTS § 912 (1979); see also RESTATEMENT (THIRD) OF TORTS: APPORTIONMENT OF LIABILITY § 26 cmt. h (2000) (advocating relaxing the burden of production when good evidence of the extent of harm caused by multiple parties is unavailable); David W. Robertson, *The Common Sense of Cause in Fact*, 75 TEX. L. REV. 1765, 1795 (1997) (explaining when apportioning on the basis of causation between a pre-existing condition and a tortfeasor's conduct, juries are instructed "to do the best they can to make the distinction" between the pre-existing condition and the " 'aggravation' brought about by the defendant's negligent conduct").