

Introduction

This document is an introduction to the topic of admissibility of expert testimony, with special emphasis on *Frye* and *Daubert* standards of admissibility. This document is a lay interpretation of these judicial standards, compiled from information available on the Internet from the Supreme Court Rulings themselves. IT IS IMPORTANT TO NOTE THAT THIS IS NOT A DOCUMENT WRITTEN BY AN ATTORNEY, AND IT IS NOT INTENDED TO DEFINITELY COVER THIS TOPIC AREA. Please use this as a way of familiarizing yourself with the topic and as a starting point for additional questions you may encounter from prospective customers.

Summary

This issue all boils down to the standards of admissibility for expert scientific testimony. Previously, either the Federal courts or Federal legislation set the standards, with states adopting those standards, as well. *Daubert* turns trial judges into “gatekeepers” responsible for ensuring testimony meets the current standards of admissibility. *Daubert* is controversial, unevenly applied, and has managed to turn many aspects of the legal system on its head.

A Brief History

Before Daubert—Previous Standards of Admissibility

Frye v. United States —The Frye Ruling, 1923

State and Federal judges usually relied on two criteria when determining the admissibility of scientific evidence:

- Relevance (if the testimony addressed a fact at issue in the case and if it would be helpful to the jury)
- *Frye*—a 1923 ruling, which held that the methods used by the expert in forming his scientific conclusions must be “GENERALLY ACCEPTED” within the expert community

Critics of *Frye v. United States* argued that it often excluded new but legitimate science that had not yet gained a consensus within the scientific community. (Hence, *Daubert v. Merrell Dow Pharmaceuticals*, see below.)

Rule 702, the Federal Rules of Evidence, 1973

This rule, passed legislatively in 1973, broadly governs the admissibility of expert testimony, but it does not mention “general acceptance.” It simply provides:

“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.”

Rule 702 is generally seen as more liberal than *Frye*. The continual emergence of always-new, cutting-edge technology made the “general acceptance” rule more stringent than it was likely

originally intended in 1923. Rule 702 opened the door for “opinion” testimony, but also opens the door to some degree of regulation of the subjects and theories about which an expert may testify. It is these regulations that *Daubert* went on to analyze and further define.

This is generally thought to be the point where trial judges were made gatekeepers for determining whether testimony is scientifically valid or not.

Daubert—1993

Summary

The case is *Daubert v. Merrell Dow Pharmaceuticals*. The Daubert family alleged in their suit that two children had serious birth defects that were caused by the mother’s prenatal ingestion of Bendectin, a drug marketed by Merrell Dow Pharmaceuticals.

The issue became the admissibility of relatively new scientific evidence by the Dauberts. There was extensive published, scientific literature on the drug, all concluding the drug had not been shown to be a risk factor for human birth defects. The Dauberts, however, presented no fewer than eight well-credentialed experts who based their conclusion that Bendectin can cause birth defects on animal studies, chemical structure analyses, and an unpublished “reanalysis” of previously published human statistical studies.

However, the District Court and even the Court of Appeals determined that the evidence did not meet the “general acceptance” standard from *Frye*. In particular, that expert opinion based on a scientific technique is inadmissible unless the technique is “generally accepted” as reliable in the relevant scientific community.

The US Supreme Court Ruling on *Daubert*

One of the first issues in *Daubert* is that lower courts applied *Frye* in the admittance of expert testimony. The US Supreme Court first held that Rule 702 should have been applied. And under 702, the testimony met the standard of “assisting the trier of fact to understand the evidence or to determine a fact in issue.” The term “SCIENTIFIC KNOWLEDGE” became pivotal at this point, since, according to the Court, Rule 702’s use of the term “scientific knowledge” implied that the testimony must be grounded in the methods and procedures of science—aka, THE SCIENTIFIC METHOD.

The big issue for the Court was that the admissibility issue should focus “solely” on the expert’s “principles and methodology,” and not on the conclusions that they generate. The Court explicitly refused to adopt any “definitive checklist or test” for determining the reliability of expert scientific testimony, and emphasized the need for flexibility. They did, however, establish several factors that the Court thought would commonly be pertinent:

1. Whether the methods upon which the testimony is based are centered upon a testable hypothesis
2. The known or potential rate of error associated with the method
3. Whether the method has been subject to peer review
4. Whether the method is generally accepted in the relevant scientific community

The focus is on the principles and methodology used to establish evidence, versus the evidence itself.

Daubert Controversy

- As of April 1999, 19 states had adopted *Daubert*; of those, 11 had rejected it. According to a paper published in June 2003, only one-third of state courts (which routinely adopt Federal Rules of Evidence) have adopted the *Daubert* criteria in determining the admissibility of expert testimony
- In the dissenting Court opinion, and echoed throughout the legal community, *Daubert* forces judges to become “amateur scientists.” This alone makes it controversial.
- The rise in excluded testimony has led to an increase in successful motions for summary judgment, since, without expert testimony, there is often little left to proceed. Summary judgments have more than doubled post-*Daubert*; 90% of those were against plaintiffs.
- The expense of defending a *Daubert* challenge appears to be having a “chilling effect” upon plaintiffs, who don’t have the same resources as large corporations and often cannot afford to defend against aggressive attacks on their experts.
- Because of the cost of mounting *Daubert* challenges, they are rarely brought in the criminal justice system, where life and liberty—rather than economic interests—are at stake. It is in this arena where the most meager rather than the most stringent scrutiny of scientific evidence is applied. Criminal law is one of the most controversial areas for *Daubert*, since so much is at stake. Because defendants are often indigent, few are able to mount a *Daubert* challenge against forensic evidence. States generally are unwilling to fund defense experts, as well.

***Daubert* Is Not A Checklist Of Necessary Conditions; Merely A Guideline**

THE MOST IMPORTANT POINT: *DAUBERT* IS A GUIDELINE, THEY ARE NOT NECESSARY CONDITIONS. The Court’s decision explicitly warns that its discussion of these factors rises only to the level of “general observations,” and that the factors listed are not exhaustive and do not constitute a “definitive checklist or test.” The decision also emphasizes that testimony may be admissible even where one or more of the factors are unsatisfied.

When misapplied as a definitive checklist, the “necessary condition” fallacy is created. And *Daubert* is, indeed, often misapplied. Really, the only important issue is whether the expert scientific testimony rests on scientific methods. *Daubert* states, “the decisive question is whether the testimony rests on methods or techniques that fairly count as scientific, and such factors as peer review and rate of error are not the criterial equals of this requirement, but rather, subsidiary indicia potentially supporting the conclusions that the requirement is satisfied.”

Beyond Daubert: General Electric v. Joiner and Kumho Tire Co. v. Carmichael

In summary, these two cases expanded upon *Daubert*. In particular, *Kumho* clarified the *Daubert* ruling by finding that it should be applied to all expert testimony, including testimony based on experience, not merely that which relied upon science. Standards for appeal set by *Joiner* make overturning a *Daubert* ruling tricky.

The Four *Daubert* Criteria for evaluating the admissibility of expert testimony are:

1. Whether the methods upon which the testimony is based are centered upon a testable hypothesis
2. The known or potential rate of error associated with the method
3. Whether the method has been subject to peer review
4. Whether the method is generally accepted in the relevant scientific community

Note that since the scientific method is the cornerstone of the philosophy of science, and thus testimony that proceeds in accordance with the scientific method will always satisfy the court's first two criteria, which seem primarily statistical, but which have their basis in philosophical tenants that have generally been accepted in the scientific community for hundreds of years.

#1 Hypothesis Testing

This distinguishes the scientific method of inquiry from nonscientific methods. Definition: “the process of deriving some proposition (or hypothesis) about an observable group of events from accepted scientific principles, and then investigating whether, upon observation of the data regarding that group of events, the hypothesis seems true.

Example: testing a six-sided die by rolling it 600 times and recording the number of times that each number is actually found face up. If each number occurred about 100 times, the statistical test will be unable to reject the hypothesis of equal probabilities. If one number occurs a disproportionate number of times, the statistical test will be likely to reject the hypothesis of equal probabilities.

#2 The Known or Potential Error Rate

Used to evaluate scientific validity and thus evidentiary reliability. It's the “known or potential rate of error” associated with using a particular scientific technique. In other words, the likelihood of being wrong that the scientist associates with the assertion that an alleged cause has a particular effect. Most scientist routinely require that this error rate be very small, usually between one and five percent.

There are two types of error rates in testing hypotheses:

Type I Error—This is the test's propensity for false positives

Type II Error—This is the test's propensity for false negatives
i.e., if a drug test for a substance comes back positive, but the tested individual has not actually used the drug, a lay person would call that a false positive, while a scientist would call it a Type I error. Type I error is the most commonly cited component of the “error rate” in hypothesis testing.

A common assertion in scientific research is that “the null hypothesis is rejected at the 1% level; or, “the result is statistically significant at the 1% level,” which means that the statistical technique used to test the hypothesis, if applied to data where the null hypothesis is true, would reject the null hypothesis only 1% of the time. In the example of the six-sided die, it would mean that if the die were not loaded, and the experiment of rolling it 600 times and testing the null hypothesis that the die was fair were done 100 times, 99 of those tests would correctly show the die to be fair, while 1 of those tests would incorrectly show the die to be loaded.

Type II error is more subtle and not commonly reported in scientific studies.

#3. Peer review and publications

This asks “whether the theory or technique has been subjected to peer review and publication.” “Peer review and publication” of a scientist’s work is largely a term of art that means that the scientist’s peers have sanctioned the work as credible and accepted if for publication. Publication then exposes the work to further review by other scientists whose responses to the research indicate their agreement or disagreement with the methods and results of the work. Peers often express agreement with a work by citing the work with approval or as authority, or by extending the work. Meeting #1 and #2 are necessary to meet #3.

#4 General Acceptance

Like #3, this is a summary measure of the extent to which the expert’s methods produce information that qualifies as scientific knowledge.

The issue becomes the definition of a “relevant scientific community.” That community can’t be a community focused on science for litigation. Otherwise, defendant’s hired experts could generally accept one sham technique that serves their purposes, while a plaintiff’s hired experts could generally accept another sham technique that serves their purposes, and both would be supported for admissibility by the general acceptance criteria despite the fact that they were both sham techniques. Thus, “the inescapable conclusion is that the relevant scientific community within which the technique finds acceptance must be the community of real world scientists who pursue science for nonlitigation purposes, and that finding general acceptance within the community of forensic scientists does not constitute general acceptance in the relevant scientific community.”