Scientific Evidence

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Developments in the 1990s

- DNA Litigation
- Daubert v. Merrell Dow Pharmaceuticals
  - Supreme Court's "junk science" decision
- Abuse Cases
  - W. Virginia, Oklahoma City

DNA Admissibility “Wars”

- Developed from university science
  - transparency
  - written protocols
  - quality assurance/quality control
  - proficiency testing
- Forensic science developed from crime labs
  - law enforcement agencies
  - adversarial system

DNA Exonerations

- Mistaken eyewitnesses: 84 %
- Police misconduct: 50 %
- Prosecutorial misconduct: 42 %
- Tainted or fraudulent science: 33 %
- Ineffective defense counsel: 27 %
- False confessions: 24 %
- Jailhouse snitches: 21 %
  - Scheck et al., *Actual Innocence* 246 (2000) (62 cases)

Abuse Cases

- In re W.Va. State Police Crime Lab., Serology Div. , 438 S.E. 501 (W. Va. 1993) (Fred Zain) (perjured testimony, false lab reports)

- Mitchell v. Gibson, 262 F.3d 1036, 1044 (10th Cir. 2001) ("Ms. Gilchrist thus provided the jury with evidence implicating Mr. Mitchell in the sexual assault of the victim which she knew was rendered false and misleading by evidence withheld from the defense.")

Internal Reforms

- Laboratory Proficiency Testing Program (1978)
- ASCLD/LAB (1981)
- TWGDAM (1988)

Expert Testimony

- (1) Subject matter requirement: Is this topic a proper subject for expert testimony?
- (2) Qualifications requirement: Is this witness qualified in this subject matter?

Subject Matter Requirement

Experimental	Expertise	Lay Knowledge
inadmissible	admissible	inadmissible
	A B	
E.g., polygraph	E.g., DNA	E.g., x-rays

Subject Matter Tests

Experimental	Expertise	Lay Knowledge
1. *Frye* test 2. *Daubert* test 3. Relevancy test 4. Other tests	A B	1. "beyond ken" (common law) 2. "assist" jury (Rule 702)

Frye v. United States

- D.C. Circuit (1923) (early polygraph)
- "General acceptance" test
- Rationale: defer to scientists
- Criticisms
  - Problems of application
  - Often obscures critical issues
  - Exception for non-novel evidence

Relevancy Approach

- Treat like other evidence: balance probative value against misleading the jury, etc. (Rule 403)
- Qualify expert, automatically qualifies technique
- Criticism: Too lax

Daubert Trilogy

- Daubert v. Merrell Dow Pharm., Inc.
  - 509 U.S. 579 (1993)
  - establishes reliability test; rejects *Frye* general acceptance test

- General Elec. Co. v. Joiner
  - 522 U.S. 136 (1997)
  - appellate review of *Daubert* issues: abuse of discretion

- Kumho Tire Co. v. Carmichael
  - 526 U.S. 137 (1999)
  - *Daubert* applies to “technical” evidence – i.e., all experts

Daubert Factors

- (1) Testing ("falsifiability")
- (2) Peer review & publication
- (3) Known or potential error rate
- (4) Standards controlling use of technique
- (5) General acceptance (from *Frye* test)

New England J. Medicine Amici Curiae Brief in *Daubert*

- "Good science requires that a proposition be supported by experimental data, be reduced to writing, and be published after undergoing peer-review *prior to* any reliance thereon."
- Peer-review's "role is to promote the publication of well-conceived articles so that the most important review, the consideration of the reported results by the scientific community, may occur after publication."

Federal Evidence Rule 702

- "If <u>scientific</u>, technical, or other specialized <u>knowledge</u> will assist the trier of fact [jury] 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: Amendment (2000)

- "if (1) the testimony is based on sufficient facts or data,
- (2) the testimony is the product of reliable principles and methods, and
- (3) <u>the witness has applied the principles and methods reliably to the facts of the case</u>."

Daubert: Initial Reviews

- "Astonishingly, all parties expressed satisfaction with the *Daubert* decision – the lawyers for the plaintiff and defense, and scientists who wrote amicus briefs."
  - Foster et al., Policy Forum: Science and the Toxic Tort, 261 Science 1509, 1614 (Sept. 17, 1993)

Comparison of Tests (1993)

Relevancy test	*Daubert* test	*Frye* test
most permissive	intermediate standard	most restrictive

Daubert: Liberal v. Strict

- "Given the Rules' permissive backdrop and their inclusion of a specific rule on expert testimony that does not mention 'general acceptance,' the assertion that the Rules somehow assimilated *Frye* is unconvincing. *Frye* made 'general acceptance' the exclusive test for admitting expert scientific testimony. That austere standard, absent from, and incompatible with the Federal Rules of Evidence, should not be applied in federal trials." 509 U.S. at 589.

Daubert (cont.)

- "The Rule's basic standard of relevance ... is a liberal one." *Id.* at 587.
- "[A] rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules and their 'general approach of relaxing the traditional barriers to 'opinion' testimony." *Id.* at 588.

But: “Gatekeeper” role

- “[I]n order to qualify as ‘scientific knowledge,’ an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation – *i.e.*, ‘good grounds,’ based on what is known. In short, the requirement that an expert’s testimony pertain to ‘scientific knowledge’ establishes a standard of evidentiary reliability.” *Id.* at 588.

United States v. Bonds

- DNA admitted at trial under *Frye* test
- "We find that the DNA testimony easily meets the more liberal test set out by the Supreme Court in *Daubert*."
  - 12 F.3d 540, 568 (6th Cir. 1993)

Borawick v. Shay

- Repressed memory evidence
- "by loosening the strictures on scientific evidence set by *Frye*, *Daubert* reinforces the idea that there should be a presumption of admissibility of evidence"
  - 68 F.3d 597, 610 (2d Cir. 1995)

Polygraph Evidence

- U.S. v. Posado (5th Cir. 1995) (per se rule of exclusion inconsistent with *Daubert*)
- *Galbreth* & *Crumby* (district courts) (1995) (admitted polygraph results)
- State cases still reject

Later Supreme Court Cases

- *Joiner* (1997):
  - *Daubert* "somewhat broader" than *Frye*
- *Kumho* (1999):
  - *Daubert* extends to nonscientific evidence
- Wisegram v. Marley Co., 528 U.S. 440 (2000)
  - *Daubert* sets an "exacting standard"

United States v. Horn

- "Under *Daubert*, ... it was expected that it would be easier to admit evidence that was the product of new science or technology. In practice, however, it often seems as though the opposite has occurred – application of *Daubert/Kumho Tire* analysis results in the exclusion of evidence that might otherwise have been admitted under *Frye*."
  - 185 F. Supp. 2d 530 (D. Md. 2002) (HGN)

Paradigm Shift

- Supreme Court in *Daubert* and *Kumho* "is plainly inviting a reexamination even of 'generally accepted' venerable, technical fields."
  - U.S. v. Hines,55 F. Supp. 2d 62, 67 (D. Mass.1999)
- "Courts are now confronting challenges to testimony … whose admissibility had long been settled."
  - U.S. v. Hidalgo, 229 F. Supp. 2d 961, 966 (D. Ariz. 2002)

Civil Cases

- "In the *Daubert* case ... the Supreme Court rejected the deferential standard of the *Frye* Rule in favor of a more assertive standard that required courts to determine that expert testimony was well grounded in the methods and procedures of science."
  - Kassierer & Cecil, Inconsistency in Evidentiary Standards for Medical Testimony: Disorder in the Courts, 288 J. Am. Med. Ass'n 1382, 1383 (2002)

Rand Institute: Civil Cases

- "[S]ince *Daubert*, judges have examined the reliability of expert evidence more closely and have found more evidence unreliable as a result."
  - Dixon & Gill, Changes in the Standards of Admitting Expert Evidence in Federal Civil Cases Since the Daubert Decision, 8 Psychol., Pub. Pol'y & L. 251 (2002)

Study of Criminal Cases

- "*Daubert* decision did not impact on the admission rates of expert testimony at either the trial or appellate court levels."
  - Groscup et al., The Effects of Daubert on the Admissibility of Expert Testimony in State and Federal Criminal Cases, 8 Pyschol., Pub. Pol'y & L. 339, 364 (2002)

Forensic Community

- "The *Daubert* Standard goes a step further than *Frye* and requires the forensic scientists to prove that the evidence is fundamentally scientifically reliable, not just generally accepted by his/her peers in the discipline."
  - Jones, President's Editorial – The Changing Practice of Forensic Science, 47 J. Forensic Sci. 437, 437 (2002)

Comparison of Tests (2007)

- No reliability test
  - E.g., Relevancy test
- Reliability tests
  - E.g., *Frye* general acceptance test
  - E.g., *Daubert* test
  - E.g., Other reliability tests

Daubert in the States

- *Frye* jurisdictions – Cal., N.Y., Fla., Ill., Pa., Md.
- *Daubert* jurisdictions
  - But not necessarily *Joiner* & *Kumho*
- Relevancy test – e.g., Wisconsin
- Other reliability tests – e.g., N.C.

Strict v. Lax Approaches

- "The choice is not between easy *Frye* and difficult *Daubert*; it is between strict and lax scrutiny."
  - Redmayne, Expert Evidence and Criminal Justice 113 (2001)

Daubert : Strict v. Lax

- U.S. v. Crisp, 324 F.3d 261 (4th Cir. 2003)
  - Admitting handwriting comparison (lax)
  - Admitting fingerprint identification (lax)

- "The government has had ten years to comply with *Daubert*. It should not be given a pass in this case." (strict)
  - Id. at 272 (Michael, J., dissenting)

Lee v. Martinez (lax *Daubert*)

- Admitting polygraph evidence under *Daubert*

- "This liberal approach [*Daubert*] to the admission of evidence is consistent with the intent of the drafters of the Federal Rules of Evidence."
  - 96 P.3d 291, 297 (N.M. 2004)

Ramirez v. State (strict *Frye*)

- "In order to preserve the integrity of the criminal justice system in Florida, particularly in the face of <u>rising nationwide criticism of forensic evidence</u> in general, our state courts … must apply the *Frye* test in a prudent manner to cull scientific fiction and junk science from fact. Any doubt as to admissibility … should be resolved in a manner that minimizes the chance of a wrongful conviction, especially in a capital case." 810 So. 2d 836, 853 (Fla. 2001)

People v. Davis (lax *Frye*)

- Admitting "lip print" evidence under *Frye*

- QD expert "testified that lip print comparison is an accepted method of scientific identification in the forensic science community . . . He is unaware of any dissent in the field regarding the methodology used to make a positive identification of a lip print."
  - 710 N.E.2d 1251 (Ill. App. Ct. 1999)

Hair Comparisons

- "This court has been unsuccessful in its attempts to locate *any* indication that expert hair comparison testimony meets any of the requirements of *Daubert*."
  - Williamson v. Reynolds, 904 F. Supp. 1529, 1558 (E.D. Okl. 1995) *rev'd on this issue*, Williamson v. Ward, 110 F.3d 1508, 1522-23 (10th Cir. 1997) (due process, not *Daubert*, standard applies in habeas proceedings)

Williamson (cont.)

- Expert: "microscopically consistent"
- Expert: "[T]here … could be another individual somewhere in the world that would have the same characteristics."

Hair Comparison (cont.)

- Most courts still admit this evidence
- DNA evidence compared: Microscopic analysis differ 12% of time.
    - Houch & Budowle, *Correlation of Microscopic and Mitochondrial DNA Hair Comparisons*, 47 J. Forensic Sci. 964 (2002)

Handwriting Comparisons

- "Because the principle of uniqueness is without empirical support, we conclude that a document examiner will not be permitted to testify that the maker of a known document is the maker of the questioned document. Nor will a document examiner be able to testify as to identity in terms of probabilities."
  - U.S. v. Hidalgo, 229 F. Supp. 2d 961, 967 (D. Ariz. 2002)

Handwriting (cont.)

- U.S. v. Prime, 363 F.3d 1028 (9th Cir. 2004) (admitting)
- U.S. v. Crisp, 324 F.3d 261 (4th Cir. 2003) (same)

Fingerprints

- U.S. v. Llera Plaza, 188 F. Supp. 2d 549, 558 (E.D. Pa. 2002) (excluding and then admitting)
- U.S. v. Mitchell, 365 F.3d 215, 247 (3d Cir. 2004) (admitting)
- U.S. v. Abreu, 406 F.3d 1304 (11th Cir. 2005) (same)

U.S. v. Havvard

- Error rate is “zero.” ???
- “Peer review” is a second examiner reviewing the analysis. ???
- Adversarial testing = scientific testing ???
  - 117 F. Supp. 2d 848 (S.D. Ind. 2000)

Fingerprints: Stephan Cowans

- Released after serving 6 years (Massachusetts) for nonfatal shooting of a police officer. First conviction overturned on DNA evidence in which fingerprint evidence was crucial in securing the wrongful conviction.
  - Loftus & Cole, Contaminated Evidence, 304 Science 673, 959, May 14, 2004

Riki Jackson

- Convicted of murder in 1997 based on bloody fingerprints discovered on a window fan.

- 2 defense experts, retired FBI examiners, testified that there was "no match."

  - McRoberts et al., Forensics Under the Microscope: Unproven Techniques Sway Courts, Erode Justice, Chi. Trib., Oct. 17, 2004

Brandon Mayfield

- Although F.B.I. found fingerprint match, Spanish officials matched the fingerprints to an Algerian national.
  - Kershaw, Spain and U.S. at Odds on Mistaken Terror Arrest, N.Y. Times, Jun. 5, 2004 at A1

FBI Report (2004)

- “[D]issimilarities … were easily observed when a detailed analysis of the latent print was conducted.”
- “inherent pressure of high-profile case”
- “confirmation bias”

FBI Report (cont.)

- "To disagree was not an expected response."
- "Verifiers should be given challenging exclusions during blind proficiency tests to ensure that they are independently applying ACE-V methodology correctly …"
    - Stacey, A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case, 54 J. Forensic Identification 707 (2004)

Fingerprint Mistakes

- Cole, More Than Zero: Accounting for Error in Latent Fingerprint Identification, 95 J. Crim. L. & Criminology 985 (2005) (documenting 23 cases of misidentifications)

Firearms Identification: Admitting Evidence

- U.S. v. Hicks, 389 F.3d 514 (5th Cir. 2004)
- U.S. v. Foster, 300 F. Supp. 2d 375 (D. Md. 2004)
- But see Schwartz, A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification, 6 Colum. Science & Tech. L. Rev. (2005)

Cartridge Case Ident. (cont.)

- Inadmissible because failed to follow standards:
- No documentation - sketches or photo
- No technical review by 2d examiner
  - U.S. v. Monteiro, 407 F. Supp. 2d 351 (D. Mass. 2006)

Cartridge Case Ident. (cont.)

- "O'Shea declared that this match could be made 'to the exclusion of every other firearm in the world.' . . . That conclusion, needless to say, is extraordinary, particularly given O'Shea's data and methods."

- Admitting similarities, but not conclusion
  - U.S. v. Green, 405 F. Supp. 2d 104 (D. Mass. 2005)

Cartridge Case Ident. (cont.)

- "I reluctantly come to the above conclusion because of my confidence that any other decision will be rejected by appellate courts, in light of precedents across the country . . . While I recognize that the *Daubert-Kumho* standard does not require the illusory perfection of a television show (CSI, this wasn't), when liberty hangs in the balance—and, in the case of the defendants facing the death penalty, life itself—the standards should be higher than were met in this case, and than have been imposed across the country. The more courts admit this type of toolmark evidence without requiring documentation, proficiency testing, or evidence of reliability, the more sloppy practices will endure; we should require more." U.S. v. Green, supra.

Reference

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