

**Out of the Daubert Fire and into the Fryeing Pan?
Self-Acceptance versus Meta-Expertise and the Admissibility of Latent Print
Evidence in *Frye* Jurisdictions**

Simon A. Cole*

ABSTRACT

While a fair amount of judicial and scholarly attention has been devoted the admissibility of latent print evidence under the Daubert standard for expert evidence, there has been no evaluation of its admissibility under the Frye standard. This is due the widespread assumption that latent print evidence is obviously admissible under Frye. This, in turn, is based on two assumptions: that latent print individualization is generally accepted in the relevant scientific community and that non-novel evidence is immune to the Frye test. Both assumptions are shown to be false. The article introduces the concept of meta-expertise to denote scientists and scholars who evaluate the knowledge claims of other experts. An analysis of the state of opinion in the scientific community shows that latent print individualization is not generally accepted. This lack of general acceptance points to a broader issue beyond the admissibility of the evidence: the continuing dramatic disconnect between the legal and scientific communities regarding the validity of latent print individualization.

*Associate Professor of Criminology, Law & Society, University of California, Irvine; Ph.D. (science & technology studies), Cornell University; A.B., Princeton University. This material is partially based upon work supported by the National Science Foundation under Grant No. SES-0115305. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation

I.	Background	4
A.	Latent Print Evidence under Two Admissibility Standards.....	4
B.	The Assumption of Admissibility under Frye.....	6
C.	Daubert Challenges to Latent Print Evidence	9
D.	The Testimonial Claim: What Must Be “Generally Accepted”?	13
E.	The Problem: Why Might the Claim Not be Generally Accepted?	14
II.	Conceptual Difficulties in the Applications of Frye	18
A.	Constituting the “Relevant Scientific Community”	18
1.	Practitioners Only	18
2.	Breadth.....	25
B.	Measuring “General Acceptance”	29
III.	Analysis of Latent Print Evidence under Frye	32
A.	Constituting the “Relevant Scientific Community”	32
1.	Why Latent Print Practitioners Cannot Constitute the Relevant Scientific Community	33
2.	Need for “Meta-Experts”	38
B.	Measuring “General Acceptance”	41
1.	Formal Surveys.....	41
2.	Surveying Expressed, Informed Meta-Expert Opinion	47
3.	Anticipated Objections.....	58
4.	Summary	63
5.	Latent Print Practitioners Literature	64

6. Anatomical Literature	67
C. Non-Novelty.....	72
IV. Frye Rulings	74
A. Commonwealth v. Patterson	75
1. The Relevant Scientific Community in <i>Patterson</i>	76
2. “Limited Room for Dissent”?	79
V. Further Implications	81
A. Implications for Daubert Jurisdictions	82
B. Frye or Daubert?.....	82
C. The Clash of the Legal and Scientific Communities.....	84

The admissibility of latent print individualization evidence has been extensively litigated under the *Daubert* standard for expert evidence over the past eight years. These efforts have produced a number of judicial opinions and a fair amount of legal scholarship on the issue of the admissibility of latent print evidence under *Daubert*. Less litigious and scholarly attention has been devoted to the admissibility of latent print evidence under the older “Frye rule.” This appears to be because of the widespread assumption that, whereas latent print individualization evidence’s ability to satisfy *Daubert*’s “reliability” requirement may be in question, its ability to satisfy *Frye*’s “general acceptance” requirement is not. It has widely been assumed that the *Frye* general acceptance standard is met by the widespread acceptance of the technique by its numerous practitioners. It has also been assumed that latent print evidence would evade Frye analysis because it is not novel evidence. Both of these assumptions are false.

Despite near unanimity among legal scholars that latent print individualization evidence fails to satisfy the *Daubert* standard, courts have ruled with near unanimity that it does satisfy *Daubert*. This article argues that, in fact, latent print individualization evidence satisfies neither *Daubert* nor *Frye*. Moreover, it suggests that, at this point exclusion of the evidence is now, counterintuitively, probably more likely under *Frye* than under *Daubert*. Thus, latent print evidence may have escaped the *Daubert* fire, only to end up in the Fryeing pan.¹

In Part I of this article, I discuss the background to latent print admissibility challenges under *Frye*. In Part II, I explore two important conceptual issues that have troubled the application of *Frye*: how to constitute the “relevant scientific community” and how to measure “general acceptance.” In Part III, I undertake a *Frye* analysis of latent print individualization evidence. I find that latent print individualization is not generally accepted in the relevant scientific community. In Part IV, I explore some of the broader implications of this finding beyond the narrow issue of legal admissibility in *Frye* jurisdictions.

I. Background

A. Latent Print Evidence under Two Admissibility Standards

The admissibility of latent print individualization evidence has been extensively litigated over the past eight years. Most of this litigation has taken place in jurisdictions that

¹ I am not the first to make this pun. Decker & Handler, Voiceprint Identification Evidence Out of the Frye Pan and Into Admissibility, 26 Am.U.L.Rev. 314 (1977); Deborah Maliver, *Out of the Frye Pan and Into Daubert: Trial Judges at the Gate Will Not Spell Relief for Plaintiffs*, 56 U. Pitt. L. Rev. 245 (1994); David Bernstein, *Out of the Fryeing Pan and Into the Fire: The Expert Witness Problem in Toxic Tort Litigation*, 10 Rev. Litig. 117 (1990); Ned Miltenberg, *Out of the Fire and into the Fryeing Pan Or Back to the Future*, 37 Trial 18 (2001).

adhere to what is colloquially known as “the Daubert standard” for determining the admissibility of expert evidence. This is the standard of review that prevails in federal court and is articulated by the Federal Rules of Evidence and the trilogy of Supreme Court cases *Daubert v. Merrell Dow Pharmaceuticals*, *General Electric v. Joiner*, and *Kumho Tire v. Carmichael*.² The Daubert trilogy holds that trial judges must ensure that all expert evidence is both relevant and reliable. It further lays out five discretionary criteria to assist judges in assessing reliability: testing, peer review and publication, standards, error rate, and general acceptance in the relevant scientific community. In addition to the federal courts, approximately 24 states have also adopted the Daubert standard.³ With some qualified exceptions, these challenges have been unsuccessful.

However, U.S. law has two major standards governing the admissibility of expert evidence. The second standard, colloquially known as “the Frye rule,” is older and derives from the 1923 D.C. Circuit case *Frye v. United States*.⁴ *Frye* posits a single test of admissibility of expert evidence, which is generally summarized by the term “general acceptance.” The relevant language from the *Frye* opinion is as follows:

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.⁵

² *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (U.S. 1993); *General Electric Co. v. Joiner*, 522 U.S. 136 (U.S. 1997); *Kumho Tire v. Carmichael*, 526 U.S. 137 (U.S. 1999).

³ Alice B. Lustre, *Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts*, 90 A.L.R.5th 453 (2001).

⁴ *Frye v. United States*, 292 F. 1013 (D.C. Cir. 1923).

⁵ *Frye v. United States*, 292 F. 1013, 1014 (D.C. Cir. 1923).

Although *Daubert* is generally perceived as the wave of the future, reports of *Frye*'s demise⁶ may be exaggerated. There are still 16 states that adhere to some form of the *Frye* rule, and "Frye states" still include some of the nation's largest jurisdictions (e.g., California, New York, Florida, Illinois, Pennsylvania).⁷ Six additional states have incorporated *Daubert* factors but continue to adhere to *Frye*.⁸ Some state supreme courts have expressed their continued adherence to *Frye* even in the wake of *Daubert*, in quite ringing terms. And, while many legal scholars have criticized *Daubert*, some have gone so far as to praise the "original insight" of the *Frye* rule and called for its reinstatement in all jurisdictions.⁹

B. The Assumption of Admissibility under *Frye*

When criminal defendants began litigating admissibility challenges to latent print evidence in 1999, it was widely assumed that such challenges were only possible under *Daubert*. In this article, I will argue that this assumption (an assumption I shared as well) may have been premature. *Daubert*, it was argued, had opened a door to reconsideration of the admissibility of latent print evidence, a door that had been closed under *Frye*.

There were a number of reasons for this assumption.

First, *Daubert* demands that expert evidence demonstrate not only relevance but also reliability. The demand for a demonstration of reliability was thought to pose greater difficulties for latent print individualization evidence, especially as the criminal defense

⁶ David L. Faigman et al., *Science in the Law: Standards, Statistics and Research Issues*, 7 (2002). (noting "The Decline of *Frye*" and citing "increasing[] use of the *Daubert* standard, but acknowledging that *Frye* "remains the standard by which science is evaluated for courtroom use in many jurisdictions.").

⁷ Alice B. Lustre, *Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts*, 90 A.L.R.5th 453 (2001).

⁸ *Id.*

⁹ Adina Schwartz, *A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification*, 6 Colum. Sci. & Tech. L. Rev. 1 (2005).

bar became aware of the fact that there were in fact no studies demonstrating the reliability of latent print individualization.¹⁰ By this time, legal scholars had begun to note the apparent irony that *Daubert*, which had explicitly stated that it was intended to loosen the restrictions on expert evidence, in fact, appeared to be a more stringent standard. Professor Saks noted that which standard was more exacting depended on the type of evidence.¹¹ Some forms of evidence, such as very cutting edge scientific results, might have high reliability but low general acceptance. Such evidence was better off under *Daubert* than *Frye*. Others enjoyed high general acceptance, but had little or no evidence demonstrating reliability. Such evidence was better off under *Frye* than *Daubert*. Professor Saks included latent print evidence (along with much of the rest of the trace evidence forensic sciences) in this category, and his analysis no doubt did much to inform many legal actors' assumptions (including mine) that challenges to latent print individualization evidence were unlikely to be successful in *Frye* jurisdictions.

Consistent with the Saksian view, most legal scholars believed that latent print individualization evidence had difficulties under all of the *Daubert* criteria. In most cases, however, an exception was made for general acceptance. Some legal scholars conceded that latent print evidence probably satisfied the general acceptance criterion.¹² Some

¹⁰ Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint "Science" is Revealed*, 75 So. Cal. L. Rev. 605 (2002).

¹¹ Michael Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science*, 49 Hastings L.J. 1069 (1998).

¹² Tamara F. Lawson, *Can Fingerprints Lie? Re-weighing Fingerprint Evidence in Criminal Jury Trials*, 31 Am. J. Crim. L. 1, 28 (2003); Tara Marie La Morte, *Sleeping Gatekeepers: United States v. Llera Plaza and the Unreliability of Forensic Fingerprinting Evidence under Daubert*, 14 Alb. L.J. Sci. & Tech. 171, 187 (2003). However, some attorneys have noted that latent print evidence enjoys acceptance only among practitioners. Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint "Science" is Revealed*, 75 So. Cal. L. Rev. 605, 646 (2002); Michael Mears & Therese M. Day, *The Challenge of Fingerprint Comparison Opinions in the Defense of a Criminally Charged Client*, 19 Ga. St. U. L. Rev. 705, 744

admissibility challenges to latent print evidence, in fact, conceded the general acceptance prong. This concession was not thought to affect the overall admissibility of latent print evidence, though. First, proffered expert evidence that met only one of five criteria would seem to be a poor candidate for admissibility. Second, as the Supreme Court noted in *Kumho Tire*, general acceptance alone is usually insufficient to render evidence admissible.¹³ This reasoning guided, for example, the ruling in *United States v. Llera-Plaza I*, restricting the admissibility of latent print evidence.¹⁴

Most importantly, it has generally been assumed that an analysis of the state of general acceptance of latent print individualization evidence is something of a “no-brainer.”¹⁵ The “relevant scientific community” is latent print examiners. All latent print examiners “accept” latent print evidence. End of argument. Many courts have concluded that latent print evidence easily satisfies the general acceptance requirement, even when evincing skepticism about its ability to satisfy some of the other Daubert criteria.¹⁶ I will argue, however, that this is an overly simplistic analysis within the meaning of *Frye*.

The final reason for assuming that *Frye* challenges to latent print evidence were not possible is a phrase in the *Frye* opinion that specifies that it applies to “novel” scientific evidence. This creates what some evidence scholars have called a “non-

(2003); Jessica M. Sombat, *Note, Latent Justice: Daubert's Impact on the Evaluation of Fingerprint Identification Testimony*, 70 Fordham L. Rev. 2819, 2836 (2002).

¹³ 526 U.S. 137 at 151 (general acceptance does not “help show that an expert's testimony is reliable where the discipline itself lacks reliability.”).

¹⁴ *United States v. Llera Plaza*, 179 F. Supp. 2d 492, 515 (E.D. Pa. 2002). (“The failure of fingerprint identifications fully to satisfy the first three Daubert factors militates against heavy reliance on the general acceptance factor.”).

¹⁵ *United States v. Gary*, 85 Fed.Appx. 908 (4th Cir. 2004) (“fingerprint analysis is one of those forms of evidence where the reliability of the science and its general acceptance is apparent without a full reexamination of the science.”).

¹⁶ *See, for example*, *United States v. Sullivan*, 246 F. Supp. 2d 700, 702 (E.D. Ky. 2003). (“The ACE-V methodology easily satisfies the general acceptance factor of Daubert.”)

novelty” loophole in *Frye*. Forms of expert evidence which either: (1) pre-date *Frye* altogether (as in the case of latent print individualization evidence), or (2) post-date *Frye*, but are not challenged until after they have become familiar enough to the criminal justice system to no longer be regarded as “novel,” would not be challengeable under *Frye*. Such forms of expert evidence would not even reach the general acceptance issue. Because *Daubert* explicitly disavowed any novelty requirement,¹⁷ it was widely assumed that challenges were more possible under *Daubert*.

For these reasons, the criminal defense bar and legal scholars alike have assumed that challenging latent print individualization evidence under *Frye* is a hopeless cause, while admissibility challenges under *Daubert* are, at least in principle, colorable. Litigants wishing to challenge the admissibility of latent print individualization evidence in *Frye* jurisdictions have generally adopted the tactic of trying to backdoor *Daubert* by urging courts to consider the *Daubert* factors in making their *Frye* determinations.¹⁸ Such tactics have not met with success.

C. Daubert Challenges to Latent Print Evidence

But the *Daubert* challenge have not met with success either. Approximately X published opinions have ruled on admissibility challenges to latent print evidence in *Daubert* jurisdictions.¹⁹ With some qualified exceptions, these opinions have all ruled latent print individualization evidence admissible. Indeed, even the qualified exceptions

¹⁷ *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 592 n. 11 (U.S. 1993). (“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.”)

¹⁸ See, for example, *People v. Clevenger*, 2003 WL 22872446 (Cal.App. 5 Dist., 2003); Brief, *People v. Luna*.

¹⁹ *Modern Scientific Evidence: The Law and Science of Expert Testimony* (David L. Faigman et al. eds., 2nd ed.2002). [Check latest edition.]

generally rule latent print individualization evidence in general admissible, while excluding some specific application of it.

This lack of success has been at stark odds with the weight of opinion in legal scholarship, nearly all of which concludes that latent print individualization evidence, as currently constituted, does not satisfy the *Daubert* standard for admissibility. Although I believe that latent print individualization evidence must be inadmissible under any reasonable reading of *Daubert*,²⁰ it now appears that a litigant may paradoxically have a better chance of success in motion to exclude latent print evidence in a *Frye* jurisdiction.

There are several reasons for this. First, at some point the precedential weight of the admissibility rulings will preclude admissibility motions under *Daubert*. Already, in 2004, the Third Circuit Court of Appeal tried not-so-subtly to put this issue to rest in its opinion upholding the admissibility of latent print individualization evidence.²¹

Second, the *Daubert* standard is notoriously vague. Indeed, vagueness is one of the opinion's principal flaws for its many critics.²² The vagueness of the *Daubert* standard principally lies in the refusal to specify the five "Daubert factors" as a "definitive checklist or test" and in the abuse of discretion standard articulated in *Joiner*.²³ These factors combine to create a regime in which a trial court can essentially do whatever it pleases with very little risk of being overturned. It is very difficult for a trial court to err under *Daubert* because most decisions with which higher courts may disagree can be

²⁰ Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again*, 41 Am. Crim. L. Rev. 1189 (2004).

²¹ *United States v. Mitchell*, 365 F.3d 215, 246 (3d Cir. 2004). ("a district court would not abuse its discretion by limiting, in a proper case, the scope of a *Daubert* hearing to novel challenges to the admissibility of latent fingerprint identification evidence-or even dispensing with the hearing altogether if no novel challenge was raised."); Simon A. Cole, *Does 'Yes' Really Mean Yes? The Attempt to Close Debate on the Admissibility of Fingerprint Testimony*, 45 *Jurimetrics* 449 (2005).

²² See, for example, John H. Mansfield, *Scientific Evidence Under Daubert*, 28 St. Mary's L.J. 1, 45 (1996).

²³ *General Electric Co. v. Joiner*, 522 U.S. 136 (U.S. 1997).

explained as either exercises of the trial judge's discretion in framing the *Daubert* inquiry or exercises of the trial judge's discretion in making the ultimate admissibility determination. It has been suggested that *Daubert* challenges to latent print evidence have failed not because there has been any empirical demonstration of the technique's accuracy or validity but because latent print evidence benefits from a high degree of what comedian Stephen Colbert has called "truthiness," an instinctual belief that something is true even if no factual basis for that belief exists.²⁴ In other words, trial judges believe that latent print evidence is accurate, even if the proponents of the evidence cannot demonstrate it, and, therefore, they are inclined to look for ways to find that the evidence satisfies *Daubert*. If latent print admissibility rulings are indeed outcome oriented, then a vague admissibility standard with a wide range of judicial discretion gives judges more room to follow their instincts. Thus, a vague standard like *Daubert* is not conducive to an unpopular cause like restricting the admissibility of latent print individualization evidence in the name scientific purity.²⁵

This point is supported by the recent *Daubert* jurisprudence on latent print evidence admissibility. The earliest opinions tended to adopt tortured readings of the *Daubert* factors in order to find that latent print evidence met all the factors with flying colors. More recent decisions, however, tend to find latent print evidence admissible

²⁴ Jennifer L. Mnookin, *Fingerprint Evidence In An Age of DNA Profiling*, 67 Brook. L. Rev. 13, 66 (2001). ("It is easy to see why judges are reluctant to exclude fingerprinting: it is a long-used technique, an extremely valuable form of evidence to prosecutors, and one in which the public has enormous faith."); Jacques Steinberg, *Truthiness*, New York Times, Dec. 25, 2005.

²⁵ The vagueness of *Daubert* has been exacerbated, I would argue, by the five factor list. The list has drawn both judicial and scholarly attention away from the concept it was meant to elucidate: "reliability." By focusing on the list, which was intended to be as "flexible" as it is vague, rather than on the FRE relevance and reliability requirement, which is neither flexible nor vague, judges and scholars have overstated the flexibility and vagueness of *Daubert*. If *Daubert* rulings are outcome-oriented, the outcome is usually achieved by interpreting the five factor list, not the FRE reliability requirement.

despite what would appear to be shocking lapses in terms of the Daubert factors. For example, *United States v. Llera Plaza II* finds latent print evidence admissible despite satisfying only the standards/error rate and general acceptance prongs. *United States v. Sullivan* found it admissible despite being “testable, although untested.”²⁶ And, *United States v. Mitchell* found it admissible despite failing the standards prong and meeting the testing prong not with true testing, but only with “implicit testing.”²⁷ None of these opinions have won praise among evidence scholars, and one could make a strong argument that they are erroneous applications of *Daubert*. But, in the final analysis, it is difficult to say that these are opinions are absolute violations of Daubert, rather than the “flexible” interpretations of it that that Supreme Court seemed to call for. Without any clear articulation as to how much failure of the Daubert criteria is too much, it is difficult to argue that any of these trial court rulings *must* be abuses of discretion.

The general acceptance test, in contrast, is fairly clear cut as legal tests go. Indeed, *Frye* has been criticized for the supposed rigidity of its “nose counting” test.²⁸ However, as I will argue below, properly conducted, a nose counting test actually favors criminal defendants. Litigants with unpopular causes like latent print admissibility challenges should want a rigid admissibility standard. Their goal would be to leave the court with no plausible legal interpretation other than excluding the evidence. Only then can a criminal defendant reasonably expect to prevail on this issue. As I will demonstrate below, this is not as impossible as it may sound.

²⁶ *United States v. Sullivan*, 246 F. Supp. 2d 700, 704 (E.D. Ky. 2003).

²⁷ *United States v. Mitchell*, 365 F.3d 215, 238 (3d Cir. 2004); Simon A. Cole, ‘Implicit Testing’: Can Casework Validate Forensic Techniques?, 46 *Jurimetrics* 117 (2006).

²⁸ Joseph D. Hatina, *Shaken Baby Syndrome: Who Are the True Experts?*, 46 *Clev. St. L. Rev.* 557, 572 n. 125 (1998).

D. The Testimonial Claim: What Must Be “Generally Accepted”?

The first step in analyzing latent print individualization under *Frye* is defining what it is that needs to be “generally accepted.” Latent print evidence whose admissibility is challenged tends to be inculpatory. Inculpatory latent print testimony, by professional guidelines, can take only one form: “individualization.” “Individualization” is defined as the conclusion that the source of the known print (the defendant) is the only possible source of a latent print, to the exclusion of all other possible sources in the universe.²⁹ This is the strongest possible conclusion that any forensic analyst could offer about anything, and latent print examiners offer it every time they testify to an inculcation. “The defendant is the source of the latent print to the exclusion of all other possible sources,” then, is the “proposition” that, under *Frye*, needs to be “generally accepted in the relevant scientific community.”³⁰

The underlying “premises” of the technique are not the propositions that need to be generally accepted.³¹ This point would seem to be self-evident, but it is of special relevance for latent print admissibility inquiries because a common tactic in both admissibility hearings and in latent print examiners’ own literature has been to advance evidence supporting the “premises” of latent print individualization instead of evidence

²⁹ Scientific Working Group on Friction Ridge Analysis Study and Technology, *Friction Ridge Examination Methodology for Latent Print Examiners*, (2002).

³⁰ *Frye v. United States*, 292 F. 1013 (D.C. Cir. 1923).

³¹ On the distinction between the validity of a technique and the theory behind it, see Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 Colum. L. Rev. 1197, 1212 (1980). Also see David H. Kaye et al., *The New Wigmore: Expert Evidence*, 164 (2004). (“For testimony to be sufficiently probative to warrant admission . . . the fundamental theory and the existence of a valid procedure for taking the necessary measurements and drawing the appropriate inferences needs to be established.”) The uniqueness of all human friction ridge skin may logically count as a “premise” of latent print individualization – it is a necessary but not sufficient condition of the claim of individualization – but I would question its status as a “theory.” The claim of uniqueness does not purport to explain how or why analyses by latent print examiners result in individualization, it merely proposes that the targets of their analyses are “unique.”

supporting the accuracy of the technique itself.³² Specifically, in admissibility hearings the government has spent a great deal of time demonstrating the “uniqueness” and “permanence” of friction ridge skin, rather than the accuracy of latent print individualization.

Numerous *Frye* state courts have supported this point that the issue in a *Frye* inquiry is not the premises of the technique but whether or not the technique itself does what it claims to be able to do.³³

E. The Problem: Why Might the Claim Not be Generally Accepted?

There are two main reasons that a claim of individualization might not be generally accepted by informed, reasonable observers. First, there are no studies that allow us to estimate the rates at which latent print examiners’ conclusions of individualization are correct and incorrect. We simply do not know how accurate latent print examiners’ conclusions are, but we do know that they are not always accurate. The government in admissibility proceedings has put forward no evidence whatsoever supporting the validity of latent print individualization. In its stead, the government has put forward the following items of evidence:

- Evidence of legal admission and use of latent print evidence.
- Evidence of the uniqueness of areas of friction ridge skin as small as the size of the average latent print.
- Evidence of permanence of friction ridge skin formations.

³² Simon A. Cole, *Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents' Discourse*, 28 Law & Pol'y 109 (2006).

³³ Velasco, 799 P.2d at 827 ("The question is not whether the scientific community has concluded that the scientific principle or process is absolutely perfect, but whether the principle or process is generally accepted to be capable of doing what it purports to do.").

- Hard evidence of reliability (not accuracy)³⁴ of the analysis of a single latent print in a single case and anecdotal evidence of reliability generally
- Embryological evidence detailing the formation of friction ridge skin.
- Statistical evidence estimating that probability of exact duplication of a fingertip-sized area of friction ridge skin is small.
- Evidence documenting the use of clean, controlled fingerprint images (not latent prints) in biometric applications.
- Evidence finding a low rate of error in training exercises in which examiners were permitted to choose the approximate level of difficulty of comparisons undertaken and could ask for “hints” from a supervisor who was aware of the true origin of the test items.
- Anecdotal, subjective evidence of a single latent print examiner’s experience of low occurrence of latent print conclusions that implicate implausible suspects.³⁵
- Testimonial claims that one laboratory (the FBI Laboratory) was not aware of having rendered any erroneous conclusions of individualization.³⁶ This claim, even if true at the time, can, of course, no longer be made.³⁷
- Evidence that one laboratory (the FBI Laboratory) had a low rate of error on uncontrolled external proficiency tests of unknown difficulty and zero errors on

³⁴ In scientific (not legal) parlance, “reliability” refers to the consistency of measurements, whereas “accuracy” refers to the correctness of measurements. Thus, in many situations (such as casework) it may be possible to determine whether latent print examiners are “reliable” (i.e., they all reach the same result), but not to determine whether they are “accurate” (i.e., whether the result is correct). Edward J. Imwinkelried, *Coming to Grips with Scientific Research in Daubert's "Brave New World": The Courts' Need to Appreciate the Evidentiary Differences between Validity and Proficiency Studies*, 61 Brook. L. Rev. 1247 (1995).

³⁵ *State v. Columbus*, No. 05-4980 (Minn. D. Ct. Hennepin Cty. 2006).

³⁶ *United States v. Llera Plaza*, 188 F.Supp. 2d 549 (E. D. Pa. 2002).

³⁷ Robert B. Stacey, *A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, 54 J. Forensic Identification 706 (2004).

internal proficiency tests whose difficulty was rated by a former Scotland Yard latent print examiner to be “a joke.”³⁸

- Evidence that quality control and quality assurance measures exist in latent print laboratories.
- Evidence that training standards control the selection of training of new (though not already-trained) latent print examiners.³⁹
- Evidence that monozygous twins have non-identical friction ridge skin.

None of this evidence, even if taken at face value, addresses the question of the accuracy of latent print individualization. In addition, none of the literature defending latent print individualization offers any evidence concerning the accuracy of latent print individualization.⁴⁰ In the absence of any information as to the accuracy of latent print individualization conclusions, an informed, reasonable observer certainly might not “accept” conclusions of individualizations. Indeed, while not all expert knowledge claims necessarily lend themselves to conventional validation through controlled experiments, given the nature of latent print examiners’ claim – that they can correctly identify the source of latent print to the exclusion of all other possible sources in the universe – any “rationalist” would demand some sort of empirical measurement of their accuracy rate.⁴¹

Even were such evidence provided, a rationalist would also probably demand discarding the “individualization” claim. The claim of “individualization” is at base a

³⁸ United States v. Llera Plaza, 188 F.Supp. 2d 549 (E. D. Pa. 2002). The value of this item is potentially undermined by allegations of cheating on these tests. David Heath, *Bungled Fingerprints Expose Problems at FBI*, Seattle Times, June 7, 2004.

³⁹ United States v. Llera Plaza, 188 F.Supp. 2d 549 (E. D. Pa. 2002).

⁴⁰ Simon A. Cole, *Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents' Discourse*, 28 Law & Pol'y 109 (2006).

⁴¹ Edward J. Imwinkelried, *The Meaning of "Appropriate Validation" in Daubert v. Merrell Dow Pharmaceuticals, Inc., Interpreted in Light of the Broader Rationalist Tradition, not the Narrow Scientific Tradition*, 30 Fla. St. U. L. Rev. 735 (2003).

claim about the rarity of the observed attributes in the latent print in a particular population (in this case the entire population of friction ridge skin in the universe). The claim is that the observed attributes are so rare that they can correspond to only one area of friction ridge skin in the universe. Such a claim obviously cannot be known directly without observing all friction ridge skin in the universe, which, of course, cannot be done. However, some forensic scientists argue that it possible to base claims of individualization on estimates of feature rarity derived from data from population samples. Some forensic DNA scientists have argued in favor of DNA “individualizations” on this basis, but the claims are controversial among forensic scientists.⁴² Latent print examiners, however, advance claims of individualization based not on extrapolations from data from representative populations, but rather based on intuitive estimates of the rarity of observed features based on nothing more than their own unsystematic experience looking at a variety of latent prints.⁴³ Rarity estimates based on such a biased and shaky foundation are widely viewed by informed observers as unscientific, highly problematic, and implausible.⁴⁴ Therefore, the “individualization” testimony is, in this sense, *always false* -- or if not false, scientifically unsustainable and indefensible -- *even when the defendant is in fact the source of the latent print*. Under such circumstances, an informed, reasonable observer might not “accept” a claim of individualization.

⁴² John Buckleton, *Population Genetic Models*, in *Forensic DNA Evidence Interpretation* 65 (Buckleton, et al. eds., 2005).

⁴³ William C. Thompson & Simon A. Cole, *Psychological Aspects of Forensic Identification Evidence*, in *Psychological Testimony for the Courts* (Costanzo, et al. eds., 2007).

⁴⁴ Sandy L. Zabell, *Fingerprint Evidence*, 13 *Journal of Law and Policy* 143 (2005); Christophe Champod et al., *Fingerprints and Other Ridge Skin Impressions* (2004); Stefan Lovgren, 'CSI' *Science Eluding Real-Life Crime Labs, Study Finds*, *National Geographic News*, (Aug. 8, 2005), http://news.nationalgeographic.com/news/2005/08/0808_050808_forensics.html. (quoting Jonathan Koehler).

II. Conceptual Difficulties in the Applications of *Frye*

The *Frye* rule has come under frequent criticism over the years. Scholars have argued that applying the *Frye* rule is not nearly as clear cut as it might appear at first glance. Two difficulties applying *Frye*, in particular, have generated concern. One is how the “relevant scientific community” is defined. The second is how “general acceptance” is measured.⁴⁵

A. Constituting the “Relevant Scientific Community”

Critics of *Frye* have pointed out that the “relevant scientific community” is not always obvious.⁴⁶ For example, situations may arise in which one specialist community “accepts” a particular principle or technique, while another specialist community is more skeptical. Such inter-community disagreements may take several forms. In some cases, one acceptance may be greater in one discipline than in another. In other cases, the disagreement may pit a practitioner community against a community of scientists.⁴⁷

1. Practitioners Only

Can a technique satisfy the *Frye* rule if it is accepted by practitioners, but not by the broader scientific community? The *Frye* case itself, as well as subsequent cases concerning polygraph evidence, were practitioner-only cases. Practitioners of lie detector tests “accepted” them as valid, whereas the broader scientific community, defined variously as psychologists, physiologists, or neurologists, was more skeptical. This was also the case in voice spectrography cases, in which practitioners of the technique

⁴⁵ David L. Faigman et al., *Science in the Law: Standards, Statistics and Research Issues*, 8 (2002).

⁴⁶ Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 Colum. L. Rev. 1197 (1980).

⁴⁷ Christopher Slobogin, *Dangerousness and Expertise*, 133 U. Pa. L. Rev. 97, 139 (1984).

accepted it as valid, whereas the scientific community, consisting of audiologists, acousticians, speech scientists, acoustical engineering, anatomists, electrical engineers, linguists, phoneticists, physicists, physiologists, psychologists, statisticians, was more skeptical.⁴⁸ In such cases, if the relevant scientific community was defined as the practitioner community, the technique appeared to be generally accepted, but if the relevant scientific community is defined as the broader scientific community it may not be.⁴⁹ Thus, as Professors Faigman, Kaye, Saks, and Sanders have pointed out, how the relevant scientific community is defined determined the outcome of the *Frye* inquiry in every case.⁵⁰

Voice spectrography cases aside, there is little disagreement on the issue of whether practitioners alone can constitute the relevant scientific community. Courts have generally found that practitioner-only acceptance cannot satisfy the *Frye* rule. In *Frye* itself, the systolic blood pressure test failed because it was not generally accepted “among physiological and psychological authorities,” rather than, say, being admitted because it was accepted by Marston and his disciples.⁵¹

Maryland’s case adopting the *Frye* rule, *Reed v. State*, chided the trial court for restricting the relevant scientific community to “the group actually engaged in the use of this technique and in the experimentation with this technique.”⁵² The court wrote:

we find that the trial court's formulation is inconsistent with the proper standard of acceptance necessary for admissibility. The circumstances of the instant case suggest no basis for “restricting the relevant field of experts” to those who have

⁴⁸ David L. Faigman et al., *Science in the Law: Forensic Science Issues*, 296 (2002).

⁴⁹ David L. Faigman et al., *Science in the Law: Forensic Science Issues*, 296 (2002).

⁵⁰ *Id.* at 297; Giannelli, *supra* note 46 at 1214 (“general acceptance of the polygraph is almost assured if the opinions of polygraph examiners are considered.”)

⁵¹ *Frye v. United States*, 292 F. 1013, 1014 (D.C. Cir. 1923).

⁵² *Reed v. State*, 391 A.2d 364, 399 (Md. 1978).

performed voiceprint experiments, and eliminating from consideration the opinions of those scientists in the fields of speech and hearing, as well as related fields, who, by training and education, are competent to make professional judgments concerning experiments undertaken by others. The purpose of the Frye test is defeated by an approach which allows a court to ignore the informed opinions of a substantial segment of the scientific community which stands in opposition to the process in question.⁵³

The Arizona Supreme Court agreed.⁵⁴

The Alaska courts have not only included non-practitioners in the relevant scientific community, but even excluded practitioners. In *Contreras v. State*, the Supreme Court of Alaska wrote:

We define the relevant scientific community as the academic, scientific, and medical or health-care professions which have studied and/or utilized hypnosis for clinical, therapeutic, research and investigative applications. It does not include those whose involvement with hypnosis is strictly limited to that of practitioner, technician or "operator" . . . We exclude technicians from the group because Frye requires scientific, not merely technical, judgments to be made.⁵⁵

The courts' rationale for evincing skepticism concerning techniques that are accepted only by practitioners appears to be motivated principally by two concerns. First, practitioners tend to be materially interested in the validity of the technique. That is, they tend to stand to benefit financially if the technique is legitimated by a favorable admissibility ruling in the courts. Therefore, such individuals' "acceptance" of the technique should be taken with a grain of salt. For example, a Florida District Court of

⁵³ *Id.*

⁵⁴ State ex rel. Collins v. Superior Court, In and For Maricopa County, 644 P.2d 1266, 1285 (Ariz., 1982) ("This requirement is not satisfied with testimony from a single expert or group of experts who personally believe the challenged procedure is accepted or is reliable.")

⁵⁵ *Contreras v. State*, 718 P.2d 129, 135 (Alaska 1986). See also, *Haakanson v. State*, 760 P.2d 1030, 1034 (Alaska App.,1988) (finding polygraph evidence failed to satisfy *Frye* because polygraph examiner, in contrast to defendant's expert, a Psychology Professor, was not member of the relevant scientific community); *Halley v. State*, 1991 WL 11650674, *3 (Alaska App.,1991) (excluding preliminary breath test evidence because testimony of practitioner did not suffice for general acceptance in relevant scientific community); *Trout-Clark v. State*, 1993 WL 13157037, *4 (Alaska App.,1993) (excluding horizontal gaze nystagmus evidence because testimony of practitioner did not suffice for general acceptance in relevant scientific community).

Appeal excluded polygraph evidence because “The only testimony was from two people who earn a living by giving polygraph tests.”⁵⁶ Similarly, the Supreme Court Michigan stated “While one would not want an expert witness without experience or background in the technical field, one would want, where the task was to demonstrate general scientific acceptability, an acknowledgment of the value of the device and the techniques by disinterested scientists whose livelihood was not intimately connected with it.”⁵⁷ In a later case, the court stated:

To allow general scientific acceptance to be established on the testimony alone of witnesses whose livelihood is intimately connected with a new technique would eliminate the safeguard of scientific community approval implicit in the general scientific acceptance test. Scientific community approval is absent where those who have developed and whose reputation and livelihood depends on use of the new technique alone certify, *in effect self-certify*, the validity of the technique. . . . If this Court were to adopt the view that the testimony of persons who have developed and whose reputation and livelihood depends on the use of a new technique alone supports admissibility, then the views of the developer and his disciples would be substituted for the scrutiny of the marketplace of general scientific opinion and the substance of the Frye test would be eliminated.⁵⁸

Courts have also recognized, however, that even beside financial interest, practitioners are vulnerable to developing a personal stake in the validity of technique. Having spent a great deal of their professional time on developing, learning, disseminating, or advocating the technique, practitioners may find it very difficult to simply concede that the technique is not valid, no matter what the empirical evidence. As the Florida court went to say, “Frye requires more than the testimony of an expert who

⁵⁶ State v. Thompson, 891 So.2d 1151, 1152 (Fla.App. 4 Dist.,2005).

⁵⁷ People v. Barbara, 255 N.W.2d 171, 180 (Mich. 1977). *See also*, People v. Coy, 669 N.W.2d 831, 838 (Mich.App.,2003) (“When demonstrating that there is general scientific recognition of novel scientific techniques or principles, it is necessary to present the testimony of disinterested and impartial experts whose livelihood is not intimately connected with the technique at issue.”); State ex rel. Collins v. Superior Court, In and For Maricopa County, 644 P.2d 1266, 1285 (Ariz., 1982) (“Acceptance must be by those experts who are relatively disinterested and impartial and whose livelihood, therefore, is not intimately connected with approval of the technique.”).

⁵⁸ People v. Young, 391 N.W.2d 270, 276 n. 24 (Mich.,1986) (emphasis added).

has a personal stake in the theory or is prone to an institutional bias.”⁵⁹ In *People v. Kelly*, the Supreme Court of California viewed the testimony of leading a practitioner of voice spectrography with caution because “he has virtually built his career on the reliability of the technique.”⁶⁰ A California appellate court in a earlier case went further, arguing, as had the Alaska Supreme Court, to exclude practitioners from the relevant scientific community, stating that in deciding whether “a technique of process is generally accepted in the scientific community, self-serving opinions should not be received.”⁶¹

About the idea of allowing practitioners to constitute the relevant scientific community, the Eight Circuit Court of Appeals said this: "Some commentators have posited the argument that the polygraph need only attain general acceptance among the polygraph operators themselves to satisfy the test for admissibility.... This position must be rejected.”⁶² Instead the court suggested that courts might turn to the mainstream scientific community: “Experts in neurology, psychiatry and physiology may offer needed enlightenment upon the basic premises of polygraphy.”⁶³ The Third Circuit also noted disapprovingly that “some courts, when they wish to admit evidence, are able to limit the impact of *Frye* by narrowing the relevant scientific community to those experts who customarily employ the technique at issue.”⁶⁴ Similarly, the Florida Supreme Court noted, “In applying the *Frye* criteria, general scientific recognition requires the testimony

⁵⁹ *State v. Thompkins*, 891 So.2d 1151, 1152 (Fla.App. 4 Dist.,2005).

⁶⁰ *People v. Kelly*, 549 P.2d 1240, 1249 (Cal. 1976).

⁶¹ *People v. King*, 266 Cal.App.2d 437, 458.

⁶² *U.S. v. Alexander*, 526 F.2d 161, 164 n. 6 (8th Cir.1975).

⁶³ *Id.*

⁶⁴ *U.S. v. Downing*, 753 F.2d 1224, 1236 (3d Cir.1985).

of impartial experts or scientists. It is this independent and impartial proof of general scientific acceptability that provides the necessary Frye foundation.”⁶⁵

Significantly, although some courts have functionally narrowed the relevant scientific community, most commonly in cases upholding the admissibility of voice spectrography, in almost none of those cases have courts defended or even articulated limiting the relevant scientific to practitioners as a *principle*.⁶⁶ One exception is the Minnesota Supreme Court, which disagreed with the Michigan Supreme Court’s insistence on relying on relatively disinterested experts.⁶⁷ Although there are some cases in which evidence is deemed admissible when it “has obtained general acceptance in only one branch of science,” such as techniques that are accepted only in forensic chemistry, but not in chemistry generally.⁶⁸ Such situations are quite different from the situation for latent prints, in which the technique is only accepted, not by a “branch of science,” but by practitioners of the technique, the vast majority of whom do not have scientific training.

Evidence scholars also agree that practitioner communities alone cannot satisfy the general acceptance requirement. Professor Black notes that such definitions of the relevant scientific community would “allow a group that advocates a technique or method to self-validate it simply by declaring acceptance.”⁶⁹ They would also allow self-validation by astrologers, cults, and what Professor Schwartz colorfully calls “mutual

⁶⁵ Ramirez v. State, 810 So. 2d 836, 851 (Fla. 2001).

⁶⁶ See, for example, Hodo v. Superior Court, Riverside County, 30 Cal.App.3d 778 (Cal. Ct. App. 1973); Commonwealth v. Lykus, 327 N.E.2d 671 (Mass. 1975); People v. Bein, 114 Misc.2d 1021 (Sup. Ct. 1982); United States v. Maivia, 728 F.Supp. 1471 (D.C. Hawai’I 1990).

⁶⁷ State v. Fenney, 448 N.W.2d 54, 60 (Minn., 1989). (“The Young decision is flawed from the Minnesota perspective because of the court’s requirement that witnesses qualified to testify as members of the relevant scientific community must be ‘disinterested and impartial’ experts whose ‘livelihood [is] not intimately connected with the new technique.’ Minnesota’s interpretation of Frye requires ‘experts in its field’ and has no such narrow requirement of disinterestedness.”)

⁶⁸ See, for example, Robinson v. State, 425 A.2d 211, 220 (Md.App., 1981).

⁶⁹ Bert Black, *A Unified Theory of Scientific Evidence*, 56 Fordham L. Rev. 595, 633 (1988).

admiration societies.”⁷⁰ Professor Schwartz notes that if the “relevant scientific community” consists solely of individuals whose “professional reputations and commercial interests . . . depend on validation of the technique, general acceptance may be a foregone conclusion.”⁷¹ Specifically with regard to latent print individualization, Professor Mnookin notes, “When there is a challenge to the fundamental reliability of a technique through which practitioners make their living, there is good reason to be especially dubious about ‘general acceptance’” in that community.⁷²

As three evidence scholars note in a prominent treatise:

a practitioner-only rule could leave an entire field largely immune from appropriate criticism. The practice of handwriting analysis, for example, is conducted by those who believe in it. The only plausible experts who can testify critically on the reliability of handwriting analysis are analysts who have developed second thoughts, the few academics who have conducted experimental studies of handwriting analysis, or the potentially greater number of academics who have studied the literature on the validity of handwriting analysis.⁷³

Instead, they suggest, “A requirement of acceptance among ‘disinterested scientists’ helps ensure that the community in which acceptance is determined consist of more than a handful of devotees of the theory or technique in question.”⁷⁴

Elsewhere, they note:

Constricting the scientific community to forensic scientists is not an adequate solution. As a formal matter, it resolves the problem of applying the general acceptance test to “forensic-only” evidence, but this limited acceptance does not necessarily demonstrate that the scientific theories

⁷⁰ Schwartz at 207.

⁷¹ Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and the Need to Resurrect the Philosophical Insight of *Frye v. United States*, 10 Harv. J. Law & Tech. 149, 201 (1997). Also see, Jay P. Kesan, A Critical Examination of the Post-Daubert Scientific Evidence Landscape, 52 Food & Drug L. J. 225, 240 (1997). (“the technique always will be deemed reliable and valid if the inquiry is limited to practitioners of the technique.”).

⁷² Jennifer L. Mnookin, *Fingerprint Evidence In An Age of DNA Profiling*, 67 Brook. L. Rev. 13, 63 (2001).

⁷³ David H. Kaye et al., The New Wigmore: Expert Evidence, 54 (2004). Everything in this passage applied equally well to latent print evidence, with the exception that the number of academics who have conducted experimental studies may be even smaller.

⁷⁴ *Id.* at 180. I would suggest that there is no good reason to think that the principle would not still apply even if, as in the case of latent print evidence, the devotees number more than “handful.”

or techniques can be relied on in court. . . . [I]f crime laboratories adopt a method before it has been adequately validated, this version of “general acceptance” will not detect the gap in the scientific foundation for the expert testimony.⁷⁵

2. Breadth

Inter-community disagreement may also arise when a specialist community “accepts” principle or technique, but the broader community is less convinced. Sociologists of science have shown that it is not uncommon for a small community close to a particular problem to have a different consensus view than the broader disciplinary community more conceptually distant from a problem.⁷⁶ For example, the state of “general acceptance” of certain scientific knowledge claims would be quite different among physicists who work with gravity wave detectors than among physicists in general. Both groups are undoubtedly “scientific communities,” they may be equally well qualified, but the state of general acceptance would be quite different depending on how narrowly or broadly the “relevant scientific community” is defined.

We might call this “the problem of breadth.” How broadly should the “relevant scientific community” be defined. In the above example, is the “relevant scientific community” for claims about gravity waves gravity wave physicists, experimental physicists, all physicists, or even all scientists? Conceptually, the problem of breadth is a difficult problem. Narrow definitions of community have the virtue of capturing a community in which most members will have a high degree of familiarity with and knowledge about the claim in question. But such communities will also have the vice of consisting of members who are more likely to have a entrenched or vested interest in the claims in questions. Likewise, a broad community will have the virtue of a community of

⁷⁵ *Id.* at 443.

⁷⁶ [Citation to be added.]

individuals with little vested interest in the problem. But such a community may not have the depth of familiarity as the narrower community.

The courts, however, have not found the problem of breadth all that conceptually difficult. Instead, virtually all courts have articulated a preference construing the relevant scientific community broadly, rather than narrowly. The courts' rationale appears to be implicitly based on the Popperian idea that criticism is necessary to test knowledge claims.⁷⁷ The courts appear to recognize that breadth is necessary to generate what the Florida Supreme Court described as "the kind of searching, critical review that is the sine qua non of scientific acceptance."⁷⁸ For example, California's case adopting the Frye rule, *People v. Kelly*, noted "Ideally, resolution of the general acceptance issue would require consideration of the views of a typical cross-section of the scientific community, including representatives, if there are such, of those who oppose or question the new technique."⁷⁹

Similarly, the Supreme Judicial Court of Massachusetts asserted that the "relevant scientific community must be defined broadly enough to include a sufficiently broad sample of scientists so that the possibility of disagreement exists."⁸⁰ The court admonished trial judges not to "define the 'relevant scientific community' so narrowly that the expert's opinion will inevitably be considered generally accepted."⁸¹ In *People v.*

⁷⁷ Karl Popper, *Conjectures and Refutations* (1965).

⁷⁸ *Ramirez v. State*, 810 So. 2d 836, 850 (Fla. 2001).

⁷⁹ *People v. Kelly*, 549 P.2d 1240, 1248 (Cal. 1976).

⁸⁰ *Canavan's Case*, 733 N.E.2d 1042, 1050 n. 6 (Mass. 2000). *See also*, *Bernardoni v. Industrial Com'n*, 362 Ill.App.3d 582, 595 (Ill.App. 3 Dist. 2005). ("A court must not define the relevant field of experts so narrowly that the expert's opinion inevitably will be considered generally accepted. If the community is defined to include only those experts who subscribe to the same beliefs as the testifying expert, the opinion always will be admissible. The community of experts must include a sufficiently broad sample of experts so that the possibility of disagreement exists.")

⁸¹ *Id.*

Watson, the Appellate Court of Illinois noted that the trial court “opined that too narrow a definition of the pertinent scientific community would render the Frye standard meaningless and ineffective” and stated, “We agree with the trial court.”⁸² The court added, “We have found overwhelming support for this view in the decisions of other courts which have confronted this issue.”⁸³ In *United States v. Porter*, the District of Columbia Court of Appeals termed “somewhat astonishing” the government’s proposal that the trial judge “severely restrict the categories of scientists whose views he should consider in assessing general acceptance.”⁸⁴ The court voiced agreement with the trial judge’s conclusion that “It simply is not creditable to argue . . . that general acceptance may be premised simply on the opinion of forensic scientists.”⁸⁵

Perhaps most significant is the absence of any opinions in which courts take the opposite view—that the “relevant scientific community” *should* be narrowly defined. There are two major categories of exceptions to the trend toward broad construal of the *Frye* test: voice spectrography cases and DNA cases.⁸⁶ In both categories, there are numerous cases in which court have upheld the admissibility of the evidence *by* narrowly construing the relevant scientific community. In the DNA cases, the government typically urged courts to define the relevant scientific community as those who practice the

⁸² *People v. Watson*, 257 Ill.App.3d 915, 926 (Ill.App. 1 Dist. 1994).

⁸³ *Id.*, (citing *Lipscomb*, 215 Ill.App.3d 413, 158 Ill.Dec. 952, 574 N.E.2d 1345; *Fishback v. People* (Colo.1993), 851 P.2d 884; *State v. Bible* (1993), 175 Ariz. 549, 858 P.2d 1152; *Vandebogart*, 136 N.H. 365, 616 A.2d 483; *People v. Pizarro* (1992), 10 Cal.App.4th 57, 12 Cal.Rptr.2d 436; *Commonwealth v. Lanigan* (1992), 413 Mass. 154, 596 N.E.2d 311; *People v. Mohit* (1992), 153 Misc.2d 22, 579 N.Y.S.2d 990; *Barney*, 8 Cal.App.4th 798, 10 Cal.Rptr.2d 731; *U.S. v. Yee* (N.D.Ohio 1991), 134 F.R.D. 161.)

⁸⁴ *U.S. v. Porter*, 618 A.2d 629, 634 (D.C. 1992).

⁸⁵ *Id.*

⁸⁶ An oft-cited “exception” to the principle of breadth, *People v. Williams*, is not really an exception. In *Williams*, the broader community was simply ignorant of the test under consideration. That differs from the case of latent print individualization, in which members of the broader community are aware of, and do not accept, the claim of the validity of latent print individualization. *People v. Williams*, 331 P.2d 251 (Cal.Super. 1958).

technique in a forensic context, whereas defendants argued that scientists who used DNA profiling techniques in academic research should also be included in the relevant scientific community. The government argued that the relevant scientific community consisted of those individuals who “got their hands dirty” doing actual forensic work, whereas defendants argued that individuals who used DNA profiling techniques in a research context were well equipped to evaluate the use of the same techniques in forensics. Both expert communities were scientists, but one derived its authority from its experience “in the trenches,” doing forensic work, whereas the other derived its authority from more traditional markers of academic prestige. The crucial issue was whether the court circumscribed the “relevant scientific community” narrowly, as those who practice *forensic* DNA profiling, or broadly, as those who practice DNA profiling techniques more generally. The decision about how widely to circumscribe the “relevant scientific community” essentially determined the outcome of the *Frye* inquiry.⁸⁷

In voice spectrography cases, Professors Faigman *et al.* have shown that the scope of the relevant scientific community determined the outcome of *Frye* rulings; all courts that construed *Frye* broadly excluded the evidence, while all courts that construed it narrowly admitted it.⁸⁸ However, although the courts construed the relevant scientific community narrowly in these cases, in none of them did the court defend narrowness as a

⁸⁷ See generally, Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and the Need to Resurrect the Philosophical Insight of *Frye v. United States*, 10 Harv. J. Law & Tech. 149 (1997); Saul Halfon, *Collecting, Testing and Convincing: Forensic DNA Experts in the Courts*, 28 Social Studies of Science 801 (1998). Interestingly, in the earliest cases, it was the government that construed the relevant scientific community broadly, bringing in high-powered academic scientists like Kenneth Kidd of Yale University and Richard Roberts. Only when criminal defendants began recruiting equally high-powered scientists from the academic community, like Richard Lewontin of Harvard University and Eric Lander of MIT, did the government seek to narrow the definition of the community. See Jay D. Aronson, *DNA Profiling: Science, Law and Controversy in the American Criminal Justice System* (2007).

⁸⁸ David L. Faigman et al., *Science in the Law: Forensic Science Issues*, 295 (2002).

principle.⁸⁹ This stands in marked contrast to the voice spectrography cases in which the relevant scientific community was construed broadly. In these cases, the courts were able to eloquently articulate the virtues of breadth.⁹⁰ The conclusion perhaps is that narrowness conveys virtues of outcome, but not of principle.

Legal scholars also support the principle of breadth. One legal commentator has recommended, “Where only proponents of a technique appear, the court should sua sponte take the responsibility of inquiring not just whether the experts believe the scientific community is generally in agreement, but whether they are in fact aware of any opposing sentiment in the relevant scientific community.”⁹¹

B. Measuring “General Acceptance”

Even if the relevant scientific community is defined, a second major ambiguity in the *Frye* rule remains. How should “general acceptance” be measured within that community? Must there be unanimous acceptance within the “relevant scientific community”? Will a simple majority do? Should some sort of supermajority be required? Should all voices be weighted equally, or should some sort of differential weighting be applied? And, if the latter, how should weight be accorded? By academic prestige? By familiarity with the specific question at hand? Or, should the opposite principle hold? Perhaps the greater the individual’s professional distance from the question at hand, the

⁸⁹ *Hodo v. Superior Court, Riverside County*, 30 Cal.App.3d 778 (Cal. Ct. App. 1973); *Commonwealth v. Lykus*, 327 N.E.2d 671 (Mass. 1975); *People v. Bein*, 114 Misc.2d 1021 (Sup. Ct. 1982); *United States v. Maivia*, 728 F.Supp. 1471 (D.C. Hawai’I 1990).

⁹⁰ See, e.g., *Reed v. State*, 391 A.2d 364 (Md. 1978).

⁹¹ Comment, 35 Md. L. Rev. 267, 293. Also see, James P. Flannery, Kara Howe, & Blanca Dominguez, *Frye, Daubert, Donaldson, And Junk Science: The Admissibility Of Novel Scientific Evidence In Illinois* 18 CBA RECORD 30, 37 (May, 2004) (“narrowing the pertinent field too much would render the *Frye* test meaningless and ineffective.”).

greater weight their opinion should be afforded, on the reasoning that they have the least interest in the outcome of the *Frye* analysis.

Although these are thorny questions, courts have not had that much difficulty working out some general practical parameters. For example, numerous courts have taken the trouble to refute the red herring that “general acceptance” means “unanimous” acceptance in the relevant scientific community.⁹² But how much “general acceptance” is required and how that should be measured remain open questions. Some courts have criticized what is variously called “nose counting” or “head counting,” a sort of crude counting of implicitly expressed “votes” in the relevant scientific community.⁹³ For some courts, nose counting is problematic because it entails weighing all opinions equally, rather than affording greater weight to the more qualified.⁹⁴ Others argue that waiting for a sufficient “nose count” will delay acceptance of cutting edge science.⁹⁵ Some courts have criticized “nose counting” in the process of arguing that a forgiving relevancy test is preferable to the *Frye* test.⁹⁶ Others have criticized it in the process of arguing for their own idiosyncratic admissibility standards.⁹⁷ Still other have criticized “nose counting” in

⁹² See, for example, *Barmeyer v. Montana Power Co.*, 657 P.2d 594 (1983); *Kaelbel Wholesale, Inc. v. Soderstrom*, 85 So.2d 539, 546 (Fla. Dist. Ct. App. 4th Dist. 2001); *In re K.T.*, 297 Ill. Dec. 38, 836 N.E.2d 769 (App. Ct. 1st Dist. 2005); *In re Commitment of Bushong*, 815 N.E.2d 103 (App. Ct. 2d Dist. 2004); *People v. Dalcollo*, 669 N.E.2d 378, 387 (Ill. 1996); *Clemons v. State*, 392 Md. 339, 896 A.2d 1059 (2006); *State v. Whittey*, 821 A.2d 1086 (N.H. 2003).

⁹³ *Kaelbel Wholesale, Inc. v. Soderstrom*, 785 So.2d 539, 546 (Fla. Dist. Ct. App. 4th Dist. 2001); *People v. Leahy*, 882 P.2d 321, 336-37 (1994); *People v. Marlow*, 41 Cal.Rptr.2d 5, 31 (Cal.App. 6 Dist.,1995); *Brim v. State*, 695 So.2d 268, 272 (Fla.,1997);

⁹⁴ *Id.*

⁹⁵ *State v. Alberico*, 861 P.2d 192, 201 (N.M.,1993).

⁹⁶ *Andrews v. State*, 533 So.2d 841 (Fla.App. 5 Dist.,1988); *Taylor v. State*, 889 P.2d 319 (Okla.,1995); *Springfield v. State*, 860 P.2d 435 (Wyo.,1993); *State v. Williams*, 446 N.E.2d 444, 448 (Ohio,1983). In this case of *Andrews*, the call for a “relevancy” test would appear to be overruled by Florida Supreme Court cases endorsing the *Frye* test.

⁹⁷ *Harper v. State*, 292 S.E.2d 389, 395 (Ga.,1982).

the process of calling for a Daubert-like reliability inquiry.⁹⁸ Other courts and some scholars have defended “nose counting.”⁹⁹ Of all the arguments against nose counting surveyed above, only the first does not entail the rejection of Frye itself. Therefore, to a court that does subscribe to Frye, the only relevant criticism is the first: the Leahy court’s caution that not all votes should necessarily be counted equally. This would seem to require some sort of weighting solution. The Leahy court argues that weighing should be operationalized by insisting that the court “must consider the quality, as well as quantity, of the evidence supporting or opposing a new scientific technique.” This notion of “quality” would seem to be something akin to scientific credentials or even prestige, and, indeed, in *Leahy* it was used to require more than the testimony of police practitioners to deem horizontal gaze nystagmus valid. This is not really a criticism of “nose counting,” but merely a tweaking of it. Indeed, it is hard to escape the conclusion that *Frye* necessarily requires some sort of polling in the scientific community, even if such polling is given the disparaging label “nose counting.” How, other than through some means of polling, is general acceptance to be ascertained? In any case, as we shall see, none of these concerns will pose any difficulty for a general acceptance analysis of latent print individualization since both crude “nose counting” and weighted prestige counts will yield the same result.

⁹⁸ U.S. v. Downing, 753 F.2d 1224, 1238 (C.A.Pa.,1985).

⁹⁹ Jones v. U.S., 548 A.2d 35, 42 (D.C.,1988) (affirming “the focus is primarily on counting scientists’ votes, rather than on verifying the soundness of a scientific conclusion.”). Goeb v. Tharaldson, 615 N.W.2d 800, 813 (Minn. 2000); Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc. and the Need to Resurrect the Philosophical Insight of Frye v. United States*, 10 Harv. J. Law & Tech. 149 (1997).

III. Analysis of Latent Print Evidence under *Frye*

We have established that for most *Frye*-subscribing courts, the relevant scientific community should be construed broadly and should not consist solely of practitioners, if practitioners should be included at all. We have also established that *Frye* necessarily entails some sort of polling of the views of that “relevant scientific community”—call it “nose counting,” if you wish. How do these principles apply to latent print evidence? Clearly, the first question that would arise would be who constitutes the relevant scientific community for the claim of latent print individualization.

A. Constituting the “Relevant Scientific Community”

Historically, it has been assumed that latent print examiners constitute the relevant scientific community, and latent print individualization enjoys high, perhaps even unanimous, “acceptance” in this community. However, as discussed above, for other forms of evidence courts have generally withheld admissibility from evidence that can show acceptance only among practitioners of the technique. Admittedly, latent print practitioners are more numerous than polygraphers or voice spectrographers. But, as one court stated, “Mere numerical majority support or opposition by persons minimally qualified to state an authoritative opinion is of little value....”¹⁰⁰

¹⁰⁰ *People v. Leahy*, 882 P.2d 321, 336-37 (1994). *See also* *People v. Marlow*, 41 Cal.Rptr.2d 5, 31 (Cal.App. 6 Dist. 1995). (“the trial court (and the appellate court on de novo review) must not simply count heads but must look to the quality as well as the quantity of evidence supporting or opposing a new scientific method.”).

1. Why Latent Print Practitioners Cannot Constitute the Relevant Scientific Community

How can latent print examiners be viewed as “minimally qualified to state an authoritative opinion” on the validity of latent print individualization? This statement may seem counterintuitive to some, but it can be easily understood by considering the difference between practicing a technique and assessing the validity of that technique. The question before the court in a *Frye* proceeding is whether the “proposition” has “passed from the experimental to the demonstrable stage.” In other words, has the correctness of the proposition been demonstrated. Knowing whether or not latent print examiners can in fact do what they claim to be able to do requires performing what is generally called a “validation study,” a study designed to measure the rate at which latent print examiners achieve correct results.¹⁰¹ Validation is a common process in science by which the ability of a test or assay to achieve correct results is measured. Scientists in a wide variety of disciplines are trained to assess whether instruments of various types have been validated. However, practicing a technique does not constitute validating it. Indeed, one can practice a technique without even being aware of whether or not it is valid. Moreover, no amount of day-to-day practice can inform the practitioner of the validity of the technique. A practitioner cannot “experience” validity. Validity must be measured, usually through a study.

Latent print examiners, however, normally undergo no such training. Latent print examiners are trained to analyze latent prints. They are not trained to conduct validation

¹⁰¹ Edward J. Imwinkelried, *The Meaning of "Appropriate Validation" in Daubert v. Merrell Dow Pharmaceuticals, Inc., Interpreted in Light of the Broader Rationalist Tradition, not the Narrow Scientific Tradition*, 30 Fla. St. U. L. Rev. 735 (2003).

studies, or to assess whether validation studies have been conducted. Most latent print examiners have minimal scientific education and could not reasonably be expected to understand validation, be able to conduct such a study, or to assess whether or not a purported validation study is of good quality. To be sure, this situation is changing with the entry of more young trainees with scientific training into the profession, and there are a few latent print examiners very familiar with validation studies.¹⁰² But even these exceptions do not make the community a good arbiter of whether latent print individualization has been validated. Because their business is analyzing prints, not conducting or assessing validation studies, the fact that “thousands of latent print examiners” accept latent print individualization should be of little value.¹⁰³ Evidence scholars suggest that individuals indifferent to validation cannot properly constitute the relevant scientific community: “The emphasis should be on *scientists* . . . If the general acceptance standard is to fulfill its objectives, the theory and technology that generate the evidence must be familiar to a community of experts who rarely embrace methods that have not been rigorously validated.”¹⁰⁴

Professor Jonakait’s characterization of electrophoresis, a more technical form of forensic evidence is equally, if not more, applicable to latent print evidence:

A forensic procedure becomes widespread not because all the people using it have made independent evaluations about reliability. . . . If the new technique appears to work, then the methods are taught to others. Since few labs can afford to employ only highly trained scientists, often those learning the procedures are not scientists, but technicians. Thus, most of those who use

¹⁰² Such as Glenn Langenburg, who has a degree in chemistry and experience in the chemical industry that involved validation studies.

¹⁰³ Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 Colum. L. Rev. 1197, 1214 (1980). (“a technician’s testimony should never suffice to establish the validity of a novel technique.”). There is no logical reason that Professor Giannelli’s statement should be limited to “novel” techniques, and he may have only used it because of the *Frye*’s novelty requirement. On the novelty requirement, *see infra*.

¹⁰⁴ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 173 (2004). (original emphasis).

the new tests have not verified the test's reliability, and few would have the training to conduct such research in any event. The users of the procedure, then, trust that the procedure is reliable, not because they have verified that fact but because the developers of the procedure say that it is reliable. Widespread use of electrophoretic tests in forensic labs thus does not indicate anything more about reliability than that a handful of people have attested to their reliability.¹⁰⁵

In fact, latent print practitioners would be the *subjects* of properly conducted validation study of the latent print individualization; it is *their* accuracy that would be measured. To allow latent print examiners to constitute the relevant scientific community to accept the validity of their own practice would be confuse the confidence of a practitioner in the validity of her own practice with validity as assessed by an outside observer. Latent print examiners do not receive valid feedback in going about the course of their work: they are not regularly told whether or not they have reached correct results for the simple reason that in casework the correct results are not known to anyone. Because they do not receive valid feedback, they are in no position to assess the accuracy of their own practice. Indeed, if asked to assess accuracy, they are very likely to confuse their own confidence with actual validity. Much the same point has been made about polygraph examiners, leading to the conclusion that “polygraph examiners are perhaps the group whose opinions concerning the technique are, paradoxically, of the least value.”¹⁰⁶

If “relevant scientific communities” were construed merely as practitioners, then astrologers would constitute the relevant scientific community to “accept” astrology and wine tasters (to take a less inflammatory example) would constitute the “relevant

¹⁰⁵ Randolph Jonakait, *Will Blood Tell? Genetic Markers in Criminal Cases*, 31 Emory L. J. 833, 860 (1982).

¹⁰⁶ William G. Iacono & David Lykken, *The Scientific Status of Research on Polygraph Techniques: The Case Against Polygraph Tests*, in *Science in the Law: Forensic Science Issues* 609, 618 (Faigman, et al. eds., 2002).

scientific community” to decide whether they are accurate at identifying the source of wine.

It is clear then, that if the question is the validity of the technique, the proper scientific community is those equipped to assess validity, not those equipped to *practice* the technique. Indeed, as several courts have noted, the very purpose of the *Frye* rule is to “ensure[] that the persons most qualified to assess scientific validity of a technique have the determinative voice.”¹⁰⁷ As the Pennsylvania Supreme Court put it, the virtue of *Frye* lies in its “requiring judges to pay deference to the conclusions of those who are in the best position to evaluate the merits of scientific theory and technique when ruling on the admissibility of scientific proof.”¹⁰⁸ This, the court argues, “is the better way of insuring that only reliable expert scientific evidence is admitted at trial.”¹⁰⁹

In addition, the concerns courts have expressed about practitioners’ interests, financial and institutional, apply with force to latent print examiners. If latent print individualization evidence were not generally accepted, it would no longer be admissible in court. Most latent print examiners would probably be out of a job. But latent print examiners’ institutional interest is probably even greater than their pecuniary interest. The extraordinary claims of “infallibility”¹¹⁰ or “total reliability”¹¹¹ that still today surround latent print individualization, as distinct from all other areas of forensic science, make the idea that technique lacks validation particularly difficult for practitioners to

¹⁰⁷ *Goeb v. Tharaldson*, 615 N.W.2d 800, 813 (Minn. 2000).; *Grady v. Frito-Lay, Inc.*, 789 A.2d 735, 743 (Pa.Super. 2001) (overturned on other grounds).

¹⁰⁸ *Grady v. Frito-Lay, Inc.*, 839 A.2d 1038, 1045 (Pa. 2003).

¹⁰⁹ *Id.*

¹¹⁰ Federal Bureau of Investigation, *The Science of Fingerprints: Classification and Uses* (1985).

¹¹¹ Scientific Working Group on Friction Ridge Analysis Study and Technology, *Press Kit*, May 18 2004, http://www.swgfast.org/swgfast_press_kit_may04.html.

accept. To accept scientists' argument that latent print individualization lacks validation would require a certain degree of admission that latent print examiners had been perpetrating a fraud, or at least an exaggeration. It is not unreasonable to think that a latent print examiner who had devoted her career to this practice would have great difficulty taking such a step. This is perhaps demonstrated by the rather visceral reaction in the latent print community to scientists' argument that the technique lacks validation.¹¹²

The California Supreme Court wrote that to establish reliability and general acceptance, "The witness must have academic and professional credentials which equip him to understand both the scientific principles involved and any differences of view on their reliability. He must also be 'impartial,' that is, not so personally invested in establishing the technique's acceptance that he might not be objective about disagreements within the relevant scientific community."¹¹³ Latent print examiners violate both criteria: They fail to understand the scientific principles that have led to differences of view about the reliability of latent print individualization, as evidenced by their consistent mustering of irrelevant argument concerning the uniqueness of friction ridge skin or the use of latent prints in casework in response to questions about the reliability of latent print individualization.¹¹⁴ And, they are not impartial.

¹¹² See, for example, David L. Grieve, *Rocking the Cradle*, 49 J. Forensic Identification 719 (1999); André Moenssens, *The Reliability of Fingerprint Identification: A Case Report* (2002), available at <http://www.forensic-evidence.com/site/ID/pollak2002.html>.

¹¹³ *People v. Brown*, 40 Cal.3d 512, 530 (Cal. 1985).

¹¹⁴ See Simon A. Cole, *Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents' Discourse*, 28 Law & Pol'y 109 (2006).

2. Need for “Meta-Experts”

If latent print examiners cannot constitute the relevant scientific community for the *validity* of latent print individualization, where can a court turn to assess general acceptance? In the case of other forms of evidence that have been subjected to *Frye* analyses, the answer was fairly obvious because what we might call “natural” communities of scientists existed to weigh the claims of practitioners. For example, when the proffered technique was voice spectrography, audiologists, acousticians, speech scientists, acoustical engineers, anatomists, electrical engineers, linguists, phoneticists, physicists, physiologists, psychologists, statisticians were variously called upon to constitute a broader scientific community to evaluate practitioners’ claims.¹¹⁵ In the case of lie detection, it seemed natural to variously call upon psychologists, physiologists, and neurologists to constitute the relevant scientific community to evaluate the claims of polygraphers.

For some forensic techniques, however, there is no “natural” scientific community. What is the relevant non-practitioner community for handwriting identification, tool mark identification, latent print identification? How does a court constitute a relevant scientific community in those cases? As Professors Kaye, Bernstein, and Mnookin note, “With procedures that have no application outside the courtroom . . . defining the relevant scientific field is a major obstacle to an even-handed and predictable application of the general acceptance standard.”¹¹⁶

¹¹⁵ David L. Faigman et al., *Science in the Law: Forensic Science Issues*, 296 n. 4 (2002).

¹¹⁶ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 170 (2004).

One possibility is a type of expert who has endeavored to assess the validity of other experts' knowledge claims. Some courts have called such experts "counter-experts,"¹¹⁷ but the term "meta-expert" perhaps conveys more accurately the nature of such expertise.

Perhaps the archetypal meta-experts were the team of legal and psychological scholars who assessed the validity of forensic document examiners' knowledge claims: Professors Denbeaux, Faigman, Risinger, and Saks. Not claiming any expertise in forensic document examination, these scholars used their training in evaluation methods to evaluate the available data that measured forensic document examiners' (FDEs) ability to do what they claimed to be able to do.¹¹⁸

The document meta-experts are illustrative of the likeliest sources of meta-experts: the legal academy and psychology are probably the most fruitful. Many techniques used as expert evidence are of primarily legal interest, and it is not surprising that legal scholars would be the ones concerned with their validity. Psychologists meanwhile, are well trained in conducting validation and evaluation research, and, among the sciences, have perhaps the longest and strongest tradition of close interaction with law.

At least two academic disciplines actually claim expertise in the study of expertise. Science & Technology Studies (S&TS), a small but growing interdisciplinary field of study, is sometimes defined as the study of expert knowledge. S&TS scholars

¹¹⁷ United States v. Mitchell, 365 F.3d 215, 245 (3d Cir. 2004).

¹¹⁸ D. Michael Risinger et al., *Exorcism of Ignorance as a Proxy for Rational Knowledge: The Lessons of Handwriting Identification 'Expertise'*, 137 U. Pa. L. Rev. 731 (1989).

sometimes define themselves as experts on expertise.¹¹⁹ Philosophy might also be viewed as a promising source of meta-experts because philosophy, to some extent, consists of assessing how things are known. This leaves philosophers well suited to assess whether or not a particular expert is indeed able to establish that she can do what she claims to be able to be able to do.

To be sure, scientists, legal scholars, S&TS scholars, and philosophers of science cannot automatically be considered meta-experts on every knowledge claim. Such scholars must undertake to understand evaluate the evidence concerning the particular knowledge claim. In other words, we want what the Court of Appeals of Maryland called “informed opinions.”¹²⁰ As the court stated, “members of the relevant scientific community will include those whose scientific background and training are sufficient to allow them to comprehend and understand the process and form a judgment about it.”¹²¹ Professor Schwartz suggests, drawing on the Michigan Supreme Court’s opinion in *Young*, that the relevant scientific community should “have a reasonably comprehensive understanding of the . . . issues.”¹²² In the case of evidence without a natural scientific community—like handwriting, tool marks, and fingerprints—meta-experts are probably courts’ best sources for unbiased, non-practitioner evaluations of whether the proffered experts can indeed support their claims.

¹¹⁹ H.M. Collins & Robert Evans, *The Third Wave of Science Studies: Studies of Expertise and Experience*, 32 *Social Studies of Science* 235 (2002).

¹²⁰ *Reed v. State*, 391 A.2d 364, 399 (Md. 1978).

¹²¹ *Reed v. State*, 391 A.2d 364, 382 (Md. 1978).

¹²² Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and the Need to Resurrect the Philosophical Insight of *Frye v. United States*, 10 *Harv. J. Law & Tech.* 149, 213 (1997).

B. Measuring “General Acceptance”

If it is accepted the court needs to look beyond the practitioner community to the broader meta-expert community, how is the court to assess the views of the meta-expert community? One “tempting”¹²³ possibility would be to somehow survey the meta-expert community. There is actually some precedent for such an approach. Several surveys have been conducted explicitly for the purpose of assessing the general acceptance of the polygraph.¹²⁴ Is there such a survey assessing the state of general acceptance of latent print individualization?

1. Formal Surveys

As it turns out, one such survey has been conducted for latent print individualization.¹²⁵ The survey was conducted by the FBI in preparation for the first Daubert challenge to latent print evidence in 1999.¹²⁶ The cover letter makes clear that the survey was meant, at least in part, to address the general acceptance prong of *Daubert*.¹²⁷ The survey did not directly ask whether the respondents generally accept latent print individualization, but it did ask, in Question #A7, “Does your agency accept the fundamental principles of uniqueness and permanence as scientific basis [*sic*] for using

¹²³ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 182 (2004).

¹²⁴ Not surprisingly, proponents and opponents were able to archive diametrically opposed results in their surveys based on the way in which they constructed the relevant scientific community. Charles R. Honts et al., *Polygraph Tests: Scientific Status*, in *Science in the Law: Forensic Science Issues* 573, 593 (Faigman, et al. eds., 2002); William G. Iacono & David Lykken, *The Scientific Status of Research on Polygraph Techniques: The Case Against Polygraph Tests*, in *Science in the Law: Forensic Science Issues* 609, 639 (Faigman, et al. eds., 2002); Ken Alder, *The Lie Detectors: The History of an American Obsession*, 256 (2007).

¹²⁵ FBI Laboratory, *Survey of Law Enforcement Agency's [*sic*] Fingerprint Operations in Support of a Daubert Hearing*, (1999).

¹²⁶ *United States v. Mitchell*, 365 F.3d 215 (3d Cir. 2004).

¹²⁷ See *infra* note 131 and accompanying text.

fingerprints as a means of individualization.”¹²⁸ All respondents who completed this part of the survey (49 respondents) responded “yes” to this survey item.¹²⁹ The survey was presented as evidence of general acceptance in the Mitchell Daubert hearing.¹³⁰ The question has again confused acceptance of the premises that make latent print individualization plausible from acceptance that latent print individualization actually works. But even if we construe the question as speaking to general acceptance of the validity of latent print individualization, rather than its premises, should the fact that 100% of respondents answered “yes” to that question indicate general acceptance in the relevant scientific community?

Probably not. In addition to the indirectness of focusing on acceptance of premises rather than of the process itself, the survey suffers from methodological flaws. For example, the surveyors might be accused of biasing the respondents by including a cover letter that began as follows:

The FBI needs your immediate help! The FBI Laboratory is preparing for a *Daubert Hearing* [sic] on the scientific basis for fingerprints as a means of identification. The Laboratory’s Forensic Analysis Section, Latent Print Unit, is coordinating this matter and supporting the Assistant United States Attorney in collecting data *needed to establish this scientific basis and its universal acceptance*. The overall strategy must specifically address the two fundamental principles (uniqueness and permanence) for using fingerprints to individualize. The availability of the requested information will not only provide supportive [sic] documentation *but will also fulfill one of the other Daubert elements, i.e., that the scientific basis is widely accepted*.¹³¹

The letter went on:

¹²⁸ FBI Laboratory, *Survey of Law Enforcement Agency's [sic] Fingerprint Operations in Support of a Daubert Hearing*, (1999).

¹²⁹ *Id.*

¹³⁰ Testimony of Stephen Meagher, Trial Trans., July 8, 1999, at 113 (“So the general acceptance of both Survey A and C is, yes, they do have general acceptance of the fingerprint discipline as a means to individualize, and that uniqueness and permanence are a basis of that.”)

¹³¹ FBI Laboratory, *Survey of Law Enforcement Agency's [sic] Fingerprint Operations in Support of a Daubert Hearing*, (1999). (emphasis added).

The time sensitive nature of these requests cannot be expressed strongly enough, nor can the importance of your cooperation. The potential impact of the Federal court not being convinced of the scientific basis for fingerprints providing individuality *has far-reaching and potentially negative ramifications to everyone in law enforcement*. the FBI wishes to present the strongest data available in an effort to insure success in this legal matter and your cooperation is a key component in achieving this success.¹³²

This stimulus would not appear to be consistent with the fundamental principles of survey research. The letter makes clear what the purpose of the study is, what answer the surveyors desire, and threatens dire social consequences (“potentially negative ramifications”), not only to the respondent but to innocent bystanders (“everyone in law enforcement”) should *every* respondent (“needed to establish . . . its *universal* acceptance”) not give the desired response.¹³³ A further biasing effect may have been exerted by the fact that, on the crucial Question #7, respondents were asked to provide “an explanation as an attachment” if they answered “no,” but not if they answered “yes.” This violates the principle of survey research that there should be symmetry between provided responses.¹³⁴ These methodological problems make the mutual accusations of methodological flaws in the polygraph surveys look like nitpicking.¹³⁵

But even these problems pale in comparison to the issue of the selection of respondents. The survey was sent to the fingerprint units of 53 law enforcement agencies (the 50 state police agencies, plus the police agencies of the District of Columbia, Canada, and the United Kingdom). As a method of polling the “relevant scientific community,” the selection of recipients clearly leaves something to be desired. The pool of recipients is limited to latent print examiners. None of the scientists who have

¹³² FBI Laboratory, *Survey of Law Enforcement Agency's [sic] Fingerprint Operations in Support of a Daubert Hearing*, (1999). (emphasis added).

¹³³ [Citation to be added.]

¹³⁴ [Citation to be added.]

¹³⁵ *Supra* note 124.

evaluated the validity of latent print individualization was included in the respondent pool. As discussed *supra*, limiting the relevant scientific community to practitioners allows a practitioners group to “self-certify” and, as the Court noted in *Kumho Tire*, would fail to bar astrology or necromancy from meeting the general acceptance test.¹³⁶ It is noteworthy that in the case of surveys designed to measure the state of general acceptance of the polygraph, even though various scientists waged a strenuous battle about how the respondent pool should be delineated, *neither* side advocated that the respondent pool be limited to practitioners (that is, polygraph operators) and exclude scientists.¹³⁷ Again, the selection problem in this survey makes the mutual accusations of selection bias in the polygraph debate look minimal.

Limiting the recipient pool to practitioners would be bad enough, but the FBI further limited it to current employees of law enforcement agencies. Although most practicing latent print examiners, no matter where they are employed, probably “accept” latent print individualization, if there are some who do have doubts, they would be more likely to express them when they are no longer employed in law enforcement.¹³⁸ The cover letter’s insinuation that a negative response to the “acceptance” question would have “far-reaching and potentially negative ramifications to everyone in law enforcement” – that is, all the survey respondents’ employers and colleagues -- only further undermines the trustworthiness of a survey of current of law enforcement employees.

¹³⁶ *Kumho Tire v. Carmichael*, 526 U.S. 137, 151 (U.S. 1999).

¹³⁷ See *supra* note 124.

¹³⁸ This point is anecdotally illustrated by the example of Mark Acree, who identified latent prints for the FBI. Upon leaving the FBI, he has now publicly expressed his doubts concerning the validity of latent print individualization. See *infra*.

Not surprisingly, given these methodological flaws, the survey has never been published or submitted to formal peer review. Again, the contrast with the polygraph surveys is telling. Even the polygraph surveys that have been criticized on the grounds of not being subjected to scientific peer review¹³⁹ came closer to proper scientific publication than the FBI survey, in that one was published in a non-refereed journal and one was submitted as successful master's thesis.¹⁴⁰

One would think that courts would be concerned by so poor a survey that so clearly seeks to limit the relevant community to practitioners. But, to the contrary, courts have accepted this survey without any qualms. In *Mitchell*, the case in which the survey was first introduced, the Third Circuit ruled that latent print individualization clearly met the general acceptance prong of *Daubert* because of “the results of the FBI's survey of state agencies.”¹⁴¹ In response to *Mitchell*'s argument that law enforcement latent print examiners did not constitute the relevant scientific community, the court drew on *Kumho Tire* to argue that “the scientific/nonscientific distinction is irrelevant.”¹⁴² But *Kumho Tire* renders the scientific/nonscientific distinction irrelevant for purposes of applying *Daubert*. That is, *Kumho* applied *Daubert* to all expert evidence. There is nothing in *Kumho Tire* that justifies the exclusion of scientists from the general acceptance analysis. Moreover, even if *Kumho* renders the scientific/nonscientific distinction irrelevant, the problems with the FBI's constitution of the relevant scientific community are greater than

¹³⁹ William G. Iacono & David Lykken, *The Scientific Status of Research on Polygraph Techniques: The Case Against Polygraph Tests*, in *Science in the Law: Forensic Science Issues* 609, 639 (Faigman, et al. eds., 2002).

¹⁴⁰ Charles R. Honts et al., *Polygraph Tests: Scientific Status*, in *Science in the Law: Forensic Science Issues* 573, 593 (Faigman, et al. eds., 2002).

¹⁴¹ *United States v. Mitchell*, 365 F.3d 215, 241 (3d Cir. 2004).

¹⁴² *Id.*; *Kumho Tire v. Carmichael*, 526 U.S. 137 (U.S. 1999).

the mere fact that law enforcement latent print examiners are not scientists. There are also the problems that the FBI's "community" is composed too narrowly and entirely of interested parties.

The FBI survey also carried great weight with the Supreme Judicial Court of Massachusetts in *Commonwealth v. Patterson*. The court found "This survey is a sufficient basis on which the judge could have concluded there to be general acceptance of the theory in the fingerprint examiner community."¹⁴³ Interestingly, the court made this finding in a decision that found *inadmissible* a special application of latent print individualization called "simultaneous impressions." The court found that simultaneous impressions lacked general acceptance in part because of the absence of a survey like the FBI's. Although an FBI latent print unit chief testified that simultaneous impressions were "generally accepted in the community of qualified fingerprint examiners," the court noted that "Unlike his testimony in the single impression context, however, Agent [*sic*] Meagher's testimony is conclusory and unsupported by any evidence, let alone an *extensive multi-jurisdictional survey*."¹⁴⁴

Although the court was correct to find that simultaneous impressions lack general acceptance, the opinion, by describing the FBI's 53-respondent, methodologically

¹⁴³ *Commonwealth v. Patterson*, 840 N.E.2d 12, 24 (Mass. 2005) (SJC-09478).

¹⁴⁴ *Id.* at 29 (emphasis added). Interestingly, a survey concerning the general acceptance of simultaneous impressions did exist at the time of *Patterson*, but the government inexplicably failed to enter it into evidence. Steve Ostrowski, *Simultaneous Impressions: Revisiting the Controversy*, 13 *The Weekly Detail*, (Nov. 5, 2001), <http://www.clpex.com/Articles/TheDetail/1-99/TheDetail13.htm>. The *Patterson* court noted that it would have found the survey unconvincing even if it were introduced into evidence because the sample was smaller than that of the FBI study (n=18, versus n=49) and it found only moderate acceptance of simultaneous impressions (10 out of 18 respondents).

At the time of Ostrowski's (non-peer reviewed) survey, no empirical studies measuring the ability of latent print examiners to correctly identify simultaneous impressions existed. (One study has since been published. John P. Black, *Pilot Study: The Application of ACE-V to Simultaneous (Cluster) Impressions*, 56 *J. Forensic Identification* 933 (2006).) Given that, even under these circumstances, 56% of latent print examiners were willing to "accept" simultaneous impressions illustrates the hazards of allowing practitioners, rather than scientists to constitute the relevant scientific community.

flawed, poorly worded survey of a highly biased sample in glowing terms (“an extensive multi-jurisdictional survey”), sets an extremely low bar for survey-based evidence of general acceptance.¹⁴⁵ Essentially, the opinion invites the government to satisfy the admissibility threshold for simultaneous impressions by conducting a survey of fifty some-odd law enforcement agents. Such an interpretation of the *Frye* rule would allow the government to claim general acceptance of any testimonial claim simply by conducting a survey of state law enforcement laboratories. This would seem to stretch the original meaning and intent of the *Frye* ruling, which, recall, referred to the acceptance of a deception test among the community of psychologists and physiologists, beyond the breaking point.

2. Surveying Expressed, Informed Meta-Expert Opinion

If the existing survey is not satisfactory, could a better survey be conducted? The problem of how to survey general acceptance for latent print individualization would be vexing for at least two reasons. First, as discussed *supra*, there is no ready-made community of scientists to evaluate the validity claims of latent print individualization. Second, in the case of latent prints, the task of seeking “informed” opinions is complicated by the absence of any scientific studies of validity or accuracy. Under these circumstances, it is not clear what an informed observer should be informed about. Clearly, they need to be informed about the absence of such studies, but how does one measure whether an individual is informed about a void, a gap in the literature?

¹⁴⁵ Again, it is paradoxical that far *broader* surveys of psychologists have generally failed to convince courts that the polygraph is generally accepted. David L. Faigman et al., Science in the Law: Forensic Science Issues, 560 (2002).

For example, one might simply survey scientists in general, reasoning that since there is no obvious discipline that pertains to latent print individualization's validity claim, any scientist would do. Such a survey, however, would presumably founder on lack of familiarity. Most surveyed scientists would simply not be familiar with the evidence or lack of evidence concerning latent print validity, and those who tried to find it might find themselves confused and puzzled when they discovered that no such evidence exists.

Given the flawed nature of the one existing survey and the significant potential obstacles to conducting a broader one, we might consider alternative ways of gauging what the Supreme Court of Missouri called the “consensus [*sic*] of informed expert opinion”?¹⁴⁶ The alternative is to survey meta-experts who have themselves taken the trouble to review the evidence and express opinions concerning it. One might, for example, compile lists of meta-experts categorized according to whether they do or do not “accept” the validity of latent print individualization. Again, there is some precedent for such an approach. Litigants have in the past submitted such lists to courts charged with performing *Frye* analyses.¹⁴⁷

a) Expert Testimony

Courts have suggested a variety of methods for measuring general acceptance. One is through the testimony of expert witnesses.¹⁴⁸ The first such inquiry for latent print

¹⁴⁶ *Alsbach v. Bader*, 700 S.W.2d 823, 829 (Mo. 1985).

¹⁴⁷ *U.S. v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978).

¹⁴⁸ *Harper v. State*, 292 S.E.2d 389, 395 (Ga. 1982) (“An evaluation of whether the principle has gained acceptance will often be transmitted to the trial court by members of the appropriate scientific community testifying as expert witnesses at trial.”). *Also see* David H. Kaye et al., *The New Wigmore: Expert Evidence*, 179 (2004).

individualization was held in *United States v. Mitchell*.¹⁴⁹ Although the hearing in *Mitchell* was governed by Daubert, not by *Frye*, the record can be used to assess the state of general acceptance of latent print individualization.

The government presented the testimony of seven expert witnesses. Three of the government experts were latent print examiners with no advanced scientific training, although some had engaged in a significant amount of scientific self-study.¹⁵⁰ All three were questioned as to whether “individualization, that is a positive identification can result from comparisons of friction ridge skin or impressions containing sufficient quality (clarity) and quantity of unique friction ridge detail.”¹⁵¹ All three answered in the affirmative.¹⁵² This would seem to show general acceptance of latent print individualization within the practitioner community. A fourth latent print examiner, who was called in rebuttal, had a Bachelor of Science degree, but he was not asked whether he accepted individualization.

In addition, the government called three non-practitioner witnesses with scientific credentials. William Babler, was a doctoral level anatomist. Babler appeared to “accept” the premises put to him. However, Babler was questioned about his acceptance of the

¹⁴⁹ *United States v. Mitchell*, 365 F.3d 215 (3d Cir. 2004).

¹⁵⁰ In particular, David R. Ashbaugh, *Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology* (1999). The other two witnesses were Ed German, of the U.S. Army, and Stephen Meagher, of the Federal Bureau of Investigation.

¹⁵¹ Trial trans., July 8, 1999, at 37. The imprecise wording of this question is unfortunate. First, asking whether positive identification “can” result elides the fundamental issue of how often such conclusions of positive identifications are correct. Because of the word “can,” the witnesses presumably must answer “yes,” even if they believe the accuracy rate of latent print individualization to be very low. Indeed, even “non-acceptors” probably would have had to answer “yes” to this question. Second, the qualifier “containing sufficient quality (clarity) and quantity of unique friction ridge detail” presumably restricts the answer to a subset of “comparisons” in which “sufficient” quality and quantity are present. Since “sufficient” is not further specified, again, the witnesses would have to answer “yes” even if the subset of comparisons that meet this condition is extremely small.

¹⁵² Trial trans., July 7, 1999, at 158-59 (Mr. Ashbaugh); Trial trans., July 8, 1999, at 37 (Mr. German); Trial trans., July 9, 1999, at 186 (Mr. Meagher). *United States v. Mitchell*, 365 F.3d 215, 223 (3d Cir. 2004).

“premises” underlying latent print individualization, specifically the uniqueness and permanence of friction ridge skin, rather than about whether he accepted the validity of latent print individualization itself.¹⁵³ As noted above, the *Frye* inquiry must be on the technique itself, not its premises. Donald Ziesig, an engineer for Lockheed Martin, was questioned about his role in conducting a study using the Lockheed automated fingerprint matching system, not about the validity of latent print individualization.¹⁵⁴ Only one of the scientists, Bruce Budowle, a doctoral level biologist, was questioned about the validity of latent print individualization. In response to essentially the same question posed to the practitioners above, Budowle answered in the affirmative.¹⁵⁵ Thus, the government showed that latent print individualization was “accepted” by many non-scientist practitioners of the technique and by one non-practitioner scientist.

The defendant presented the testimony of three expert witnesses. All three were, to different degrees, meta-experts with varying degrees of practitioner competence. David Stoney, a doctoral level forensic scientist, was trained to analyze latent prints, but primarily made his living in other areas, particularly microscopy. James Starrs was a Professor of both Law and Forensic Science. The third defense expert was the author, who holds a doctorate in a social science (Science & Technology Studies). Neither Starrs nor the author claimed to be able to analyze latent prints. All three defense experts testified that latent print individualization had not been validated. Thus, broadly stated, they did not “accept” latent print individualization.

¹⁵³ Trial trans., July 7, 1999, at 74. *United States v. Mitchell*, 365 F.3d 215, 223 (3d Cir. 2004).

¹⁵⁴ *United States v. Mitchell*, 365 F.3d 215, 223 (3d Cir. 2004).

¹⁵⁵ Trial trans., July 9, 1999, at 141. *United States v. Mitchell*, 365 F.3d 215, 223 (3d Cir. 2004).

Thus, the state of the scientific community at the time of the Mitchell hearing would seem to argue against admissibility under *Frye* (Table 1). Latent print individualization was self-certified by thousands of its own practitioners, but the government was able to identify only a single non-practitioner, credentialed scientist to say he “accepted” latent print individualization. Moreover, one might imagine that the fact that this single scientist happened to be an FBI employee would raise alarms for the court. In contrast, the defense was able to point to three non-practitioner meta-experts who did not accept the validity of latent print individualization. To be sure, the defense witnesses had weaknesses as well. The government could have pointed to Professor Starrs’s lack of a doctoral degree, or the fact that the author was a social, not a natural, scientist. But, it would seem that these objections would be overcome by Starrs’s position as a Professor of both Law and Forensic Science at a prestigious university and the fact that the author’s training was in a social science discipline whose precise aim was to seek to understand the nature of scientific knowledge claims. In any case, it would seem difficult to see how a court would construe this lineup as “acceptance” unless was relying on acceptance among practitioners. Only by excluding non-practitioners from the relevant scientific community could a court find latent print individualization generally accepted.

[Table 1 around here.]

b) Amicus Curiae Briefs

One possible objection to basing a general acceptance evaluation on expert testimony is that the numbers are necessarily small. Taking expert testimony is a slow and unwieldy method of gauging the views of “relevant scientific community.” A court

might hesitate to rule a form of evidence, especially such a venerable form of evidence as latent print evidence, inadmissible based on the testimony of three individuals, even if they outweighed their counterparts threefold.

One way of more efficiently getting the views of the “relevant scientific community” before the court is through *Amicus Curiae* Briefs. By soliciting multiple signatories on a single briefs, parties can convey the extent of support for a particular scientific proposition without the burden on the courts’ time of calling each individual individual to testify under oath. Scientists and scholars prize reputation above all else and would be unlikely to take lightly the act of adding their names to an *Amicus Curiae* Brief that did not accurately reflect their views.

Amicus Curiae Briefs are relatively uncommon in the lower courts that have heard most admissibility challenges to latent print evidence. However, one court, the Supreme Judicial Court of Massachusetts, did solicit *amicus* briefs pursuant to an admissibility challenge. Although three briefs were submitted, two were submitted on behalf of legal organizations. One brief, however, is pertinent to assessing the acceptance of latent print individualization in the relevant scientific community. This Brief was submitted by the New England Innocence Project on behalf of 15 scientists and scholars.¹⁵⁶ All 15 scientists and scholars agreed that latent print individualization lacked validation.

The composition of the *amici* was varied. Fourteen of the fifteen held terminal degrees (Ph.D. or J.D., several of them held both), the remaining signatory held a

¹⁵⁶ David M. Siegel et al., *The Reliability of Latent Print Individualization: Brief of Amici Curiae submitted on Behalf of Scientists and Scholars by The New England Innocence Project, Commonwealth v. Patterson*, 42 Crim. L. Bull. 21 (2006).

master's degree in Forensic Science. The *amici* came from a variety of disciplines: Biology, Mathematics and Statistics, Law, Political Science, Psychology, Linguistics, and Science & Technology Studies. These disciplinary backgrounds reflect the meta-expert problem for latent print individualization: there is no single discipline that is naturally interested in the problem of latent print individualization. Those individuals who are interested in the problem have tended to arrive at it through a variety of different pathways. Many come from Law—because latent print individualization is primarily deployed in the law—or from Psychology, which is accustomed both to interacting with law and to evaluating validity claims.

The government, in the *Patterson* case was able to identify no additional non-practitioners who “accepted” the claim of the validity of latent print individualization.

The *Patterson* case changed the general acceptance outlook substantially (Table 2). Although the majority of meta-experts had not accepted the validity of latent print individualization even at the time of *Mitchell*, their raw numbers were relatively small. By the time of *Patterson*, however, the number was significantly larger, which should have helped assuage any concerns that the court may have about being misled by a small number of “fringe” scientists. Most of the new meta-experts had presumably been drawn to examine the validity claims of latent print individualization by the substantially publicity surrounding the *Llera Plaza* case. Moreover, while there was no good reason to treat the Mitchell-era meta-experts as “fringe,” any such concerns should have been put to rest by the time of *Patterson*. While determined advocates could always impugn the motives or credentials of one or more of the Patterson-era meta-experts, there is quite simply no way to interpret the entire list of Patterson-era meta-experts as “fringe.”

Finally, aside from raw numbers, the trend of meta-expert opinion at the time of *Patterson* was quite clear. While more and more meta-experts were supporting the claim that latent print individualization has not been validated, few new meta-experts were supporting the opposite position. Thus, even if the state of meta-expert acceptance was clear at the time of *Mitchell*, by the time of *Patterson* it was even clearer.

[Table 2 around here.]

c) Published Literature

Perhaps the most common method of evaluating general acceptance is by examining the published literature.¹⁵⁷ Published literature is perhaps the ultimate proof in the scientific pudding: it is where scientists and scholars take most seriously the notion of being held to the arguments they put their name to. Put simply, scientists and scholars expect to have to defend those arguments they make in published literature. Therefore, a court seeking to assess the state of general acceptance of a particular proposition might do well to survey the scientific literature speaking to that proposition. Courts have indicated their approval of the notion of referring to the scientific and legal literature in making assessments of general acceptance.¹⁵⁸ As Judge Altenbernd, put it, “the Frye standard is not a direct measure of scientific trustworthiness. Instead, it is based on the assumption that the science will be trustworthy if scientists worthy of trust have

¹⁵⁷ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 178 (2004). (“In general, the proponent of the evidence should prove general acceptance by surveying scientific publications. Studies demonstrating the validity of new (*or old*) methods, appearing without contradiction in prominent scientific journals, reference works, or textbooks, are perhaps the best indicia of general acceptance.”) (emphasis added).

¹⁵⁸ *People v. Kelly*, 549 P.2d 1240, 1247 (Cal. 1976). (“amici have cited a number of scientific and legal articles containing differing forms of opposition to the admissibility of voiceprint evidence. Such writings may be considered by courts in evaluating the reliability of new scientific methodology.”); *People v. Shirley*, 723 P.2d 1354, 1376 (Cal. 1982) (“scientists have long been permitted to speak to the courts through their published writings in scholarly treatises and journals.”).

published articles and made public statements in support of the scientific principle or procedure.”¹⁵⁹

What might such a survey for latent print individualization reveal? A glance at the legal and scientific literature reveals authorities by twenty different authors or sets of authors attesting to the lack of validation of latent print individualization.¹⁶⁰ It also reveals

¹⁵⁹ *Brim v. State*, 779 So.2d 427 (Fla. 2d DCA 2000).

¹⁶⁰ See 2 DAVID FAIGMAN, ET AL, *MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY* §27-2.3.1 at 386 (2nd ed. 2002). (“Woe to fingerprint practice were such [*Daubert* admissibility] criteria applied.”); Michael Saks, *Merlin and Solomon: Lessons from the Law’s Formative Encounters with Forensic Identification Science*, 49 HASTINGS L. J. 1069, 1106 (1998) (“By conventional scientific standards, any serious search for evidence of the validity of fingerprint identification is going to be disappointing. . . . A vote to admit fingerprints is a rejection of conventional science as the criterion for admission. A vote for science is a vote to exclude fingerprint expert opinions.”); James E. Starrs, *Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed the Bounds*, 35 CRIM. L. BULL. 234 (1999) (“Instead of meaning incapable of error, fingerprint identifications are declared to be infallible on account of the uniqueness of fingerprints to each person . . .”); David A. Stoney, *Measurement of Fingerprint Individuality*, in *ADVANCES IN FINGERPRINT TECHNOLOGY* 327, 383 (H. C. Lee and R. E. Gaensslen eds., 2001) (“From a statistical viewpoint, the scientific foundation for fingerprint individuality is incredibly weak.”); Jennifer L. Mnookin, *Fingerprint Evidence In An Age of DNA Profiling*, 67 BROOK. L. REV. 13 (2001) (“In the case of fingerprinting, the general rate of error is simply not known.”); SIMON A. COLE, *SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION* (2001); David L. Faigman, *Is Science Different for Lawyers?* 297 SCIENCE 339 (2002) (fingerprinting has “not been seriously tested”); Paul Giannelli, *Fingerprints Challenged!* 17 CRIM. JUST. 33, 35 (Spring 2002) (“In its interpretation of *Daubert*, *Plaza I* is a well-written opinion. *Havvard* is not.”); Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint “Science” is Revealed*, 75 SO. CAL. L. REV. 605, 657 (2002) (“Having considered the various indicators of reliability set forth by the Supreme Court in *Daubert*, it is evident that at the present time, latent fingerprint identifications do not constitute reliable evidence.”); Jessica M. Sombat, *Latent Justice: Daubert’s Impact on the Evaluation of Fingerprint Identification Testimony*, 70 FORDHAM L. REV. 2819, 2825 (2002) (“the result Judge Pollak reached when he excluded expert testimony concerning fingerprints [in *Llera Plaza I*] was fair.”); *Recent Case*, 115 HARV. L. REV. 2349, 2352 (2002) (“Fingerprint expert testimony does not survive application of the *Daubert* factors . . .”); Lyn Haber and Ralph Norman Haber, *Error Rates for Human Fingerprint Examiners*, in *AUTOMATIC FINGERPRINT RECOGNITION SYSTEMS* 339 (N. K. Ratha and R. Bolle eds., 2004) (“no data have been collected on how accurately latent print examiners match different images of the same finger.”); Donald Kennedy, *Forensic Science: Oxymoron?* 302 SCIENCE 1625 (2003) (Fingerprinting’s “reliability is unverified either by statistical models of fingerprint variation or by consistent data on error rates.”); David H. Kaye, *The Nonscience of Fingerprinting: United States v. Llera Plaza*, 21 QLR 1073, 1087 (2003) (“As *Llera-Plaza I* so clearly reveals, this [the evidence advanced in support of the admissibility of latent fingerprint individualization] does not satisfy *Daubert*.”); Jennifer L. Mnookin, *Fingerprints: Not a Gold Standard*, 20 ISSUES IN SCI. & TECH. 47 (2003) (“Judge Pollak’s first opinion [restricting latent fingerprint individualization testimony] was the better one.”); Tamara F. Lawson, *Can Fingerprints Lie? Re-weighting Fingerprint Evidence in Criminal Jury Trials*, 31 AM. J. CRIM. L. 1, 65 (2003) (“Currently fingerprint analysis is under attack because of the lack of study done on the accuracy of the examiners . . .”); Tara Marie La Morte, *Sleeping Gatekeepers: United States v. Llera Plaza and the Unreliability of Forensic Fingerprinting Evidence under Daubert*, 14 ALB. L.J. SCI. & TECH. 171, 173 (2003) (discussing “strong indications that the fingerprinting field should not survive a rigorous *Daubert* analysis.”); JANE CAMPBELL

authorities by two authors holding the opposite position.¹⁶¹ These two lists of authorities unequivocally strengthen the case against the general acceptance of latent print individualization validity.¹⁶²

Many of the scholars who produced this literature have already been accounted for in our previous two surveys. Indeed, most of the entrants in our previous two tables produced some published literature. In Table 3, I report “new entrants” to the field: those scholars who appear in a survey of the literature but did not already appear in our surveys of meta-expert witnesses and *amici*. In this table, I have tried to include all scholarly articles that directly address the issue of the validity of latent print individualization. I have excluded articles that do not directly address the issue of validity.

MORIARTY, PSYCHOLOGICAL AND SCIENTIFIC EVIDENCE IN CRIMINAL TRIALS, §12:15 (2004) (“The assumption of the validity of fingerprinting rests upon law, rather than science.”); Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again*, 41 AM. CRIM. L. REV. 1189, 1215 (2004) (“It is clear that no studies exist that measure the accuracy of fingerprint examiners when they make conclusions of identification.”); Nathan Benedict, *Fingerprints and the Daubert Standard for Admission of Scientific Evidence: Why Fingerprints Fail and a Proposed Remedy*, 46 ARIZ. L. REV. 519, 538 (2004) (“... judges have generally relied on their instincts and the long history of judicial acceptance of fingerprint evidence to admit it without serious consideration of the science behind it.”); Sandy L. Zabell, *Fingerprint Evidence*, 13 J. L. & POL’Y 143, 178 (2005) (“ACE-V is an acronym, not a methodology.”) (Original emphasis). Michael Mears & Therese M. Day, *The Challenge of Fingerprint Comparison Opinions in the Defense of a Criminally Charged Client*, 19 Ga. St. U. L. Rev. 705, 745 (2003). (“Those forensic experts who have examined this issue, as opposed to those whose livelihood depends upon perpetuating the misconception that fingerprint analysis is based upon the scientific method, have found the fingerprint field to be scientifically deficient.”) Not all of the cited quotations refer directly to lack of validation. (See, for example, the quotation from Professor Zabell.) However, in all of the cited works, the overall message of the article is one of non-acceptance. Moreover, many of the authors (such as Zabell) also gave further indication of their views by signing the *amicus* brief discussed above.

¹⁶¹ André Moenssens, *Fingerprint Identification: A Valid Reliable "Forensic Science"?*, 18 Crim. Just. 31 (2003); Stephen M. Stigler, *Galton and Identification by Fingerprints*, 140 Genetics 857 (1995); Stephen M. Stigler, *The Fingerprint Controversy*, 20 Issues in Sci. & Tech. 12, (Winter, 2004). Professor Moenssens has been quite clear in his views. I am including the other scholar, Professor Stigler in the conservative spirit of interpreting the evidence in the light least favorable to my argument. At the same time, I want to be careful to be fair to Professor Stigler. I must confess that I suspect that were the issue presented as sharply as I have endeavored to do here Professor Stigler’s views might turn out to be more consistent with the “non-acceptors” views than his published writings indicate. But this is mere supposition on my part, and I characterize him as an “acceptor” here in the conservative spirit of interpreting the evidence in the light least favorable to my argument.

¹⁶² See also Mnookin, Comment, LAW PROBABILITY & RISK (forthcoming).

It should be noted that, like the other tables, Table 3 is a table of scholars, not of published works. Scholarship is measured as an indicator of the views of the scholar who produced it. Therefore, I have included each scholar as a single item, no matter how many works addressing the validity of latent print individualization she has produced. This seems the fairest way to proceed so as not to allow the counts to be dominated by a small number of scholars who produce a large numbers of works repeatedly drawing the same conclusion. A small number of scholars' views were difficult to categorize, and they are not included in Table 3.¹⁶³

[Table 3 around here.]

As Table 3 indicates, a survey of the published literature still further strengthens the case against the general acceptance of latent print individualization. A survey of the publisher literature adds two highly credentialed scholars to the list of non-acceptors, but ten more non-acceptors. If we remove Mr. Epstein and Mr. Mears and Ms. Day, on the grounds of their having been adversaries in an admissibility challenge to latent print evidence, that leaves eight new non-acceptors. It is also important to note that, a survey of published literature alone would be even more lopsided than Table 3 indicates because most of the entrants on Tables 1 and 2 have produced published literature. The relative

¹⁶³ Principally, this refers to the group of scientists surrounding Professor Champod. Their views have been expressed in numerous articles and comprehensive book. Christophe Champod, *Edmond Locard -- Numerical Standards and 'Probable' Identifications*, 45 J. Forensic Identification 136 (1995); Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51 J. Forensic Identification 101 (2001); Christophe Champod et al., *Fingerprints and Other Ridge Skin Impressions* (2004). Although these scholars express confidence in latent print identification, they also acknowledge that it has not been validated and characterize its conclusions as based on a "leap of faith." Christophe Champod et al., *Fingerprints and Other Ridge Skin Impressions*, 33 (2004). This characterization is consistent with that of Dr. Stoney, who has testified for defendants in admissibility challenges, but Champod *et al.* have not so testified. In addition, they reject the concept of "individualization," which is fundamental to contemporary latent print practice, at least in the United States. Scientific Working Group on Friction Ridge Analysis Study and Technology, *Friction Ridge Examination Methodology for Latent Print Examiners*, (2002). Under these circumstances, it does not seem justified to characterize these scholars as either "acceptors" or "non-acceptors."

number of authorities in notes 160 and 161 give some indication of what survey of the published literature would look like.

At this point, by the most conservative accounting, the meta-expert “score” stands at 25-3 against acceptance. In summary, we can conclude that non-accepting meta-experts have always outnumbered accepting meta-experts and that the difference is becoming more pronounced as time goes on. As of this writing, a significant number of meta-experts have expressed clear opinions that latent print individualization lacks validation. At the same time, the government and fingerprint community have shown remarkably little success at finding any non-practitioner scientist or scholar to take the position that latent print individualization has been validated. The result of a Frye analysis, therefore, should be clear.

3. Anticipated Objections

As noted above, one of the characteristics of the *Frye* admissibility regime is that designations of the “relevant scientific community” are highly contestable. It may be anticipated that proponents of latent print evidence would object to the constitution of the relevant scientific community, as I have construed it in the preceding section. What might be the basis for such objections?

First, it might be objected that the meta-experts in Tables 1 and 2 consist simply of paid defense experts and that their opinions are, therefore, of no value. Some scholars have argued that individuals with a substantial pecuniary, or even a non-pecuniary, interest, should be excluded from a properly constituted relevant scientific community in

a proper *Frye* analysis.¹⁶⁴ One might arguably exclude the opinions of up to five members of Tables 1-2 on these grounds because they have testified on behalf of criminal defendants in challenges to latent print evidence. Even the exclusion of these five meta-experts is debatable because even those scholars who argue for the exclusion of interested experts suggest that the test should be applied carefully and should only exclude experts whose “livelihood,” to quote the Michigan Supreme Court, is “intimately connected with the new technique.”¹⁶⁵ Thus, under this careful test, it is not clear that these meta-experts should necessarily be eliminated at all.

However, even if they are eliminated, the overall general acceptance picture does not change because in the meta-expert community the non-acceptors still dramatically outnumber the acceptors. Moreover, if the opinions of those meta-experts who have ever testified on behalf of criminal defendants were bracketed, it would also be necessary to bracket the opinions of interested government experts, whose livelihood is far more “intimately connected” to the technique than any of the meta-experts who have testified on behalf of defendants. This would have the effect of eliminating all latent print examiners’ opinions from consideration. It would also be necessary to eliminate two of the three scholars who support the claim of latent print individualization. Dr. Budowle is an employee of the Federal Bureau of Investigation, a law enforcement agency housing the largest collection of fingerprint records in the world. Professor Moenssens, though a

¹⁶⁴ Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and the Need to Resurrect the Philosophical Insight of *Frye v. United States*, 10 Harv. J. Law & Tech. 149, 209 (1997).

¹⁶⁵ *Id.* at 210. The court’s reasoning that “a certain degree of ‘interest’ must be tolerated if scientists familiar with the theory and practice of a new technique are to testify at all,” is supported by the fact that elimination of the five meta-experts who have ever testified for defendants would eliminate some of the experts whose knowledge of validity issue is greatest and who have written most extensively about it.

distinguished scholar, was himself practitioner of latent print analysis.¹⁶⁶ Thus, eliminating “interested” experts would, in fact, leave the government in a worse position because latent print individualization evidence, rather than being accepted by thousands of practitioners and three meta-experts and not accepted by twenty-five or so meta-experts, would now be accepted only by one meta-expert and not accepted by twenty meta-experts.

Another potential objection to the meta-experts in Tables 1-3 is that some of them are not scientists. Some scholars have suggested that a rigorous application of *Frye* requires that the relevant scientific community consist of scientists.¹⁶⁷ Many of the meta-experts listed on Tables 1-3 are legal scholars, some are social scientists, and two are forensic scientists. Each of these categories might reasonably be accused of not being scientists. Whatever the merits of the argument to bracket the opinions of some meta-experts on Table 1-3 as non-scientists, the argument on the whole is unconvincing. First, some meta-experts who may appear to be legal scholars in fact have scientific training. One legal scholar on Table 3, despite being a Professor of Law, has only a master’s level degree in law, but a doctoral degree in Psychology. Another law professor has a master’s degree in Psychology in addition to his degree in law, and another has a master’s degree in forensic science in addition to his degree in law. Second, many of the legal scholars on Tables 1-3 are evidence scholars and have acquired a sophisticated understanding of

¹⁶⁶ Andre A. Moenssens, *The Fingerprint Witness in Court*, 54 Finger Print and Identification Magazine 3, (1973).

¹⁶⁷ Adina Schwartz, A “Dogma of Empiricism” Revisited: *Daubert v. Merrell Dow Pharmaceuticals, Inc.* and the Need to Resurrect the Philosophical Insight of *Frye v. United States*, 10 Harv. J. Law & Tech. 149, 208 (1997).

scientific arguments, methods, and procedures.¹⁶⁸ Third, legal scholarship is changing, and these days it verges much more closely to the scientific, or at least the social scientific, than it did in the past. Although some legal scholars continue to limit themselves to doctrinal, textual analysis, many contemporary legal scholars deploy sophisticated empirical and statistical analyses.¹⁶⁹ Fourth, given that latent print individualization (as opposed to other uses of friction ridge information, such as biometrics or dermatoglyphics) is almost solely used in legal, not scientific, settings, it is hardly surprising that legal scholars are among the most likely members of the scholarly community to take the time to develop a “reasonably comprehensive understanding” of the evidence concerning its validity. Therefore, it might reasonably be argued that the legal academic community does to some extent constitute the relevant scientific community for the question of the validity of latent print individualization.

With regard to the social scientists on the list, the question of whether or not social science should be characterized as “science” is a hotly debated one. Even if one concluded that it should not, two of the meta-experts on the list (including the author) were trained in a discipline that might be an exception. Science & Technology Studies (STS) is a field of social science that takes science as its object. As such, training in this discipline involves a great deal of training, education, and thought about what it is that makes various proposition, theories, research programs, or disciplines “scientific.”

¹⁶⁸ For example, Professor Kaye is undoubtedly among the leading legal scholars in the world in terms of his understanding of statistical inference and also commands sophisticated knowledge of the science that contributes to DNA testing.

¹⁶⁹ Robert C. Ellickson, *Trends in Legal Scholarship: A Statistical Study*, 29 *Journal of Legal Studies* 517, 526 (2000).

Individuals with this training might be viewed as especially well equipped to assess whether or not a body of evidence supports a particular knowledge claim.

Finally, it might be objected that four of the entrants on Table 3 were authored by law students. It is perhaps appropriate to assign less weight to student authored publications. Nonetheless, the conventions of legal scholarship dictate that a great deal of legal scholarship is student authored. Although student authored literature is traditionally accorded less weight than faculty authored material, it is not uncommon for student authored literature to be treated as authority in legal scholarship and indeed in judicial opinions by even the highest courts.¹⁷⁰ There seems, therefore, to be no sound justification for bracketing the opinions of student authors. In any case, even removing student authored material does not significantly change the overall general acceptance picture. Moreover, it is notable that every single student authored article on the subject finds that latent print individualization has not been validated. If there were a colorable argument to be made that latent print individualization *has* been validated, one would imagine that some law professor would direct a student to it, as a more interesting research and writing project than yet another article noting the lack of validation. And yet, no such article has appeared. Could this be because no such argument can be made?

As with the elimination of interested meta-experts, any strict bracketing of non-scientist meta-experts actually strengthens rather than weakens the case against general acceptance of latent print individualization evidence. Such a procedure would eliminate the vast majority of practitioners, who lack backgrounds in science. This would leave the technique accepted only by a small community of practitioners who do have backgrounds

¹⁷⁰ Bart Sloan, *What Are We Writing For? Student Works as Authority and their Citation by the Federal Bench, 1986-1990*, 61 Geo. Wash. L. Rev. 221, 227 (1992).

in science (if one wants to label someone with a degree in science who practices latent print identification for a living a “scientist”) and three meta-experts. But a significant number of non-acceptor meta-experts would remain.

4. Summary

Based on the evidence assembled in Tables 1-3, a general acceptance analysis of latent print individualization evidence under *Frye* should be an easy case. As long as a court resists the temptation to allow the practitioner community to self-certify its own knowledge claims, the picture is quite clear. The acceptors include only three scholars, two of whose opinions arguably should be eliminated on the basis of their being too closely interested. The non-acceptors, however, include more than 20 scholars, from a diversity of disciplinary perspectives. While various criticisms might be made of various individuals among the non-acceptors, none applies to all of them, not even the criticism of not being practitioners. In their totality, this group wields a high degree of academic firepower: they include two members of the National Academy of Science, one of the most prestigious honors bestowed in scientists in the United States, the former President of one of the top five research universities in the United States, and some of the legal academy’s most eminent evidence scholars. They include four Harvard degrees (the “acceptor” group also includes one). Although the motives or qualifications of some of these individuals may be impugned, the point is that, even the elimination from consideration of a couple of them, still leaves the opinions of some of the others standing. The point here is that proposition that latent print individualization lacks validation seems to be approaching very closely a state in which the weight of scholarly opinion, despite all personal and disciplinary differences, is converging toward a common conclusion.

This, it would seem, is precisely what the notion of “general acceptance in the relevant scientific community” was intended to capture.

None of this is to suggest that courts must, as a general rule, deem propositions unacceptable every time they are presented with a petition containing the signature of 25 people with advanced degrees, or that degrees from fancy universities should automatically connote authority. Deference to meta-experts must surely be exercised with caution. However, in this case, the totality of evidence of non-acceptance, combined with the failure of the proponents of the evidence to attract any significant support from any informed observers outside the practitioner community would seem to be a situation that should make a court very uncomfortable about deeming the evidence “generally accepted.”

5. Latent Print Practitioners Literature

Another potential criticism of Table 3 and note 160 might be that it draws on legal and mainstream scientific literature and ignores the literature most closely related to the issue at hand, the forensic science literature. It might be argued that there is a robust body of forensic science literature that supports acceptance of latent print individualization.

In fact, there is almost no discussion of latent print validation in the forensic science literature. The most prestigious forensic journals (*Journal of Forensic Sciences* and *Forensic Science International*) contain some material on the development and imaging of latent prints, on the variability of friction ridge skin,¹⁷¹ on fingerprint

¹⁷¹ See, for example, Nicole Egli et al., *Evidence Evaluation in Fingerprint Comparison and Automated Fingerprint Identification Systems -- Modelling with Finger Variability*, For. Sci. Int. (2006); Cedric Neumann et al., *Computation of Likelihood Ratios in Fingerprint Identification for Configurations of Any Number of Minutiae*, 52 J. Forensic Sci. 54 (2007); Cedric Neumann et al., *Computation of Likelihood*

forgery,¹⁷² and one report on proficiency testing,¹⁷³ but essentially no discussion of validation.¹⁷⁴ There is a short discussion of latent print validation in less well known forensic journal, but that article essentially conceded lack of validation and characterizes latent print individualization as a “leap of faith.”¹⁷⁵

Beyond the general forensic literature, there is also a narrower literature on forensic *identification*, an area in which latent prints are an important component. The “flagship journal” in this area is clearly the *Journal of Forensic Identification*. Other journals include *Fingerprint Whorld* and *The Print*. In addition, a great deal of latent print practitioner literature is also “published” online. Important web sites that post original articles include www.clpex.com, www.forensic-evidence.com, Fingerprints.tk,¹⁷⁶ Ridges and Furrows,¹⁷⁷ and www.latent-prints.com. Taken together, these sources provide a substantial literature about latent print identification. Does this literature support the case for general acceptance?

One might, first, question whether this constitutes a scientific literature. The online articles are neither peer reviewed nor subjected to a selective publication process.

Ratios in Fingerprint Identification for Configurations of Three Minutiae, 51 J. Forensic Sci. 1 (2006); C.H. Lin et al., *Fingerprint Comparison I: Similarity of Fingerprints*, 27 J. Forensic Sci. 290 (1982); David A. Stoney & John I. Thornton, *A Critical Analysis of Quantitative Fingerprint Individuality Models*, 31 J. Forensic Sci. 1187 (1986); John I. Thornton, *The Snowflake Paradigm*, 31 J. Forensic Sci. 399 (1986); John I. Thornton, *The DNA Statistical Paradigm vs. Everything Else*, 42 J. Forensic Sci. 758 (1997).

¹⁷² Boris Geller et al., *Fingerprint Forgery -- A Survey*, 46 J. Forensic Sci. 731 (2001); Boris Geller et al., *A Chronological Review of Fingerprint Forgery*, 44 J. Forensic Sci. 963 (1999).

¹⁷³ Joseph L. Peterson & Penelope N. Markham, *Crime Laboratory Proficiency Testing Results, 1978-1991, II: Resolving Questions of Common Origin*, 40 J. Forensic Sci. 1009 (1995).

¹⁷⁴ It is perhaps worth noting that a review in the *Journal of Forensic Sciences* of the author’s book, that makes the claim that latent print individualization has not been validated, makes no mention of the fact that the book makes this claim. One might imagine that such a claim would be of importance, or at least interest, to forensic scientists. [Citation to be added.]

¹⁷⁵ David A. Stoney, *What Made Us Ever Think We Could Individualize Using Statistics?*, 31 Journal of the Forensic Science Society 197 (1991).

¹⁷⁶ <http://www.xs4all.nl/~dactyl/index.htm>.

¹⁷⁷ <http://www.ridgesandfurrows.homestead.com/index.html>

The *JFI* is a peer reviewed journal (though not all categories of article are peer reviewed), It might be argued, however, that the *JFI* has only the superficial appearance of a scientific journal. The *JFI* evolved from *Identification News*, which was clearly more of an industry newsletter than a scientific journal. Even today, the *JFI*'s Editorial Board is only partially composed of credentialed scientists,¹⁷⁸ and many the contributors are not scientists.

Our argument here, however, need not rely on such unkind insinuations. Even if we grant *JFI* status as a full-fledged scientific journal, the fact of the matter is that almost nothing in it addresses the validity of latent print individualization, and nothing at all in it provides evidence in support of the validity of latent print individualization. The *JFI* contains a great deal of informative, useful, and, presumably, scientific valid information about important topics concerning latent print analysis, such as the detection and imaging of latent prints. But it contains almost no articles dealing with the topic of the validity of latent print individualization. Those few articles that do address validity are unsatisfactory in terms of providing support for the claim. Some steer around the issue altogether. A case in point is a recent article that Wertheim and Maceo¹⁷⁹ that, as I have shown elsewhere, mentions validity in its opening paragraph and then never broaches the topic again.¹⁸⁰ Instead, the article is an extended effort to explicate the “biological

¹⁷⁸ Although I am not familiar with the credentials of all the members of the current Editorial Board, I think I can safely hazard the not more the half of them have advanced (master's or above) degrees in science. 57 J. FORENSIC IDENTIFICATION (July/Aug. 2007).

¹⁷⁹ Kasey Wertheim & Alice Maceo, *The Critical Stage of Friction Ridge Pattern Formation*, 52 J. Forensic Identification 35 (2002).

¹⁸⁰ Simon A. Cole, *Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents' Discourse*, 28 Law & Pol'y 109 (2006). In an email, one of the authors argued that my critique was unfair because the article was not *intended* to address the validity of latent print individualization, just “biological uniqueness.” That's fine, but it supports my argument that validity is simply *unaddressed* in the practitioner literature.

uniqueness” of friction ridge skin, an issue that, as already stated here and elsewhere in the literature, is irrelevant to the validity of latent print individualization. Other articles simply declare the validity of latent print individualization.¹⁸¹ But a careful reading of these articles reveals that they contain no references to any studies, data, or other evidence supporting the validity of latent print individualization. In sum, therefore, though the practitioner literature is substantial and useful for arbitrating important questions like how best to image latent prints, none of it directly addresses the validity question.¹⁸² Therefore, it is simply irrelevant to the question of whether the validity claims of latent print individualization are generally accepted. The legal and scientific literature cited in note 160, in contrast, does address the question of the validity of latent print individualization, and it is to this literature, therefore, that a court seeking to evaluate the general acceptance of latent print individualization should turn.

6. Anatomical Literature

Another literature not represented in note 160 is anatomical literature. Some latent print proponents have argued that anatomy is the “science” in which latent print individualization is rooted,¹⁸³ and some courts have endorsed this argument.¹⁸⁴ It is true that there is a substantial body of literature concerning the formation and variability of friction ridge skin. Should this literature be considered evidence of general acceptance of latent print individualization in the relevant scientific community? Can anatomists

¹⁸¹ John D. "Dusty" Clark, *ACE-V: Is It Scientifically Reliable and Accurate?*, 52 J. Forensic Identification 401 (2002); Kasey Wertheim, *Letter re: ACE-V: Is It Scientifically Reliable and Accurate?*, 52 J. Forensic Identification 669 (2002).

¹⁸² This argument is made in greater detail in Cole, *Is Fingerprint Identification Valid?*

¹⁸³ David R. Ashbaugh, *Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology* (1999).

¹⁸⁴ *United States v. Llera Plaza*, 188 F.Supp. 2d 549 (E. D. Pa. 2002).

constitute the relevant scientific community for the issue of latent print individualization, and, if so, do they generally accept it?

Generally speaking, those anatomists who do research on friction ridge skin do not concern themselves with the accuracy of latent print individualization. Their research interest is in the formation of friction ridge skin and, to a lesser extent, its function. At times, they have offered opinions as to the *uniqueness* of friction ridge skin. One anatomist, William Babler, testified to such an opinion in the admissibility hearing in *Mitchell*. But, neither Babler nor any other anatomist has ever offered an opinion, in print, as to the accuracy of latent print individualization. This is why Babler is not included on Tables 1-3.

Perhaps the best way to delineate the anatomical literature is to refer to a bibliography of 120 references submitted into evidence by the government in the first Daubert admissibility challenge in *Mitchell*. The bibliography was offered in response to both the “peer review and publication” and the “general acceptance” prongs of *Daubert*.¹⁸⁵

It’s an impressive body of literature. However, none of the anatomical literature cited in this bibliography addresses the issue of the validity of latent print individualization. Some of the literature addresses the formation of friction ridge skin, some of it discusses looking for correlations between friction ridge skin patterns and disease or behavioral characteristics, some if it explores whether ethnicity can be predicted from friction ridge skin patterns, and some it seeks to trace ancestry through

¹⁸⁵ *Memorandum of Law in Support of Government's Motion for Reconsideration of the Court's Exclusion of Fingerprint Opinion Testimony*, 35 (2002). (“there is extensive peer review and widespread acceptance of the basis [*sic*] method of fingerprint analysis.”).

friction ridge skin patterns. None of this is directly relevant to attributions of the source of latent prints by professional latent print examiners.

Let me offer some support for this assertion. At the time of the *Mitchell* hearing, I estimate that I had already read 31 of the sources listed in the bibliography through my own research on the history of fingerprinting.¹⁸⁶ I knew, from having read these sources, that very few of them even addressed the validity of latent print individualization,¹⁸⁷ and those that did addressed it in a critical way.¹⁸⁸ At least one was a history book that had little to say about validation.¹⁸⁹ At least one of the sources explicitly eschewed discussion of latent print evidence altogether, leading one to wonder why it was included on the list at all.¹⁹⁰ I, therefore, suspected that the remainder of the sources did not address it either. In order to make a provisional test of this hypothesis, I selected 27 sources that seemed, based on their titles *most likely* to contain information about latent print individualization. In this exercise, I excluded sources that seemed *least likely* to contain information about latent print individualization. For example, I excluded a book entitled *Handbook of Mathemeatical [sic] Functions, with Formulas, Graphs, and Mathematical Tables*,

¹⁸⁶ Simon A. Cole, *Suspect Identities: A History of Fingerprinting and Criminal Identification* (2001).

¹⁸⁷ For example, some of the better known sources address only the formation or uniqueness of friction ridge skin, not the accuracy of latent print individualization. Francis Galton, *Finger Prints* (1892); Harris Hawthorne Wilder & Bert Wentworth, *Personal Identification: Methods for the Identification of Individuals, Living or Dead* (1918); Harold Cummins & Charles Midlo, *Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics* (1943). For more detail on this argument, see Cole, *Is Fingerprint Identification Valid?*

¹⁸⁸ *Modern Scientific Evidence: The Law and Science of Expert Testimony* (David L. Faigman et al. eds., 1st ed. 1997); I. W. Evett & R. L. Williams, *A Review of the Sixteen Points Fingerprint Standard in England and Wales*, 46 *J. Forensic Identification* 49 (1996). A possible exception is the thoughtful discussion of fingerprint evidence in Bernard Robertson & G. A. Vignaux, *Interpreting Evidence: Evaluating Forensic Science in the Courtroom*, 137 (1995). But this discussion largely elides discussion of validity, concluding only that “Fingerprint identification is matter of expert judgment” (at 146).

¹⁸⁹ *Identification Wanted: Development of the American Criminal Identification System, 1893-1943* (Donald C. Dilworth ed. 1977).

¹⁹⁰ Colin G.G. Aitken, *Statistics and the Evaluation of Evidence for Forensic Scientists*, 132 (1995). (“Evaluation of fingerprint evidence is not discussed here.”)

another entitled *Statistics*, and another entitled *Evolution*.¹⁹¹ (However, just for fun, I included *Grey's Anatomy*, even though I did not expect that it would have much to say about the validity of latent print individualization.) I assigned a research assistant to look up these articles and search them for any reference to latent print identification (not specifically to validity). Many of the sources were old or in relatively obscure journals, and my assistant was unable to locate nine of the sources. (It should be noted that this search was conducted at a branch of the largest research library in the world.)¹⁹² To be sure, more diligent searching might eventually unearth more of these sources. In addition, if the source was not available in the University of California Libraries, we did chose not to entail the costs of interlibrary loan. But I am satisfied that such measures were not necessary as explained below.

Of the 18 sources that were successfully retrieved, only 5 of them even remotely discussed latent print identification at all. The remainder discussed the embryological formation of friction ridge skin, the inheritance of friction ridge skin patterns, or “dermatoglyphics,” the interpretation of friction ridge skin patterns. At least one did not even contain the word “fingerprint.”¹⁹³ Another concerned the formation of skin in general, not even specifically friction ridge skin.¹⁹⁴ (In addition, according to my assistant, *Grey's Anatomy* does not discuss fingerprinting at all.) Of the 5 that did discuss latent print identification, one discussed the identification of prints by automated systems

¹⁹¹ I subsequently obtained *Evolution*. There do not appear to be any references to fingerprinting, latent prints, or even to friction ridge skin. The following search terms were not found in the index: fingerprints, hands, papillary, friction, skin, epidermis, palm.

¹⁹² <http://libraries.universityofcalifornia.edu/>

¹⁹³ See, for example, Sumiko Kimura & Tadashi Kitagawa, *Embryological Development of Human Palmar, Plantar, and Digital Flexion Creases* 216 *The Anatomical Record* 191 (1986).

¹⁹⁴ B. Allen Flaxman & Paul F. A. Maderson, *Growth and Differentiation of Skin*, 67 *Journal of Investigative Dermatology* 8 (1976).

not humans,¹⁹⁵ and two stated that fingerprints were “useful” for individual identification.¹⁹⁶ Only two directly addressed the issue of accuracy.¹⁹⁷ One of these asserted that latent print identification was “accurate,” and both claimed it was “infallible.”¹⁹⁸ A closer examination of these two authorities reveals no studies, data, or evidence supporting these assertions but only *ipse dixit* declarations. Chatterjee declares that “it was proved scientifically that identification from fingerprints was infallible,” but offers not indication as to what “proof” this statement refers.¹⁹⁹ The only proof discussed in the remainder of the article is Galton’s purported “proof” of the *persistence* of friction ridge details.²⁰⁰ Puri states that “It is now an established fact that the science of fingerprints is an exact one and the most accurate method of human identification.”²⁰¹ Again, there is no indication as to what it was that supposedly “established” this “fact.” Puri makes reference to “court decisions” that supposedly “show that identification through fingerprints is flawless and infallible,”²⁰² but of course a court decision can show no such thing.²⁰³ The remainder of the article is devoted to the “identical twins” argument

¹⁹⁵ Andrea A. Roddy & Jonathan Stosz, *Fingerprint Features -- Statistical Analysis and System Performance Estimates*, 85 Proc. IEEE 1390 (1997).

¹⁹⁶ S. M. S. Bhalla, *Can the Science of Fingerprints Be Stifled by Human Ingenuity or Manipulation*, 15 J. Indian Acad. of Forensic Sci. 24 (1976); Ralph M. Garruto & C.C. Plato, *Fingerprints, Palms, and Soles: Historical Transitions*, 27 Birth Defects Original Article Series 7, 10 (1991). reprinted in *Dermatoglyphics: Science in Transition* (C.C. Plato et al. eds., 1991). (which is the work cited in the government’s bibliography).

¹⁹⁷ K. S. Puri, *Do Monozygotic Twins Have Identical Fingerprints?*, Int’l Crim. Police Rev. 45 (1968); S. K. Chatterjee, *Origin of Fingerprint Science and Its Development During Last 75 Years*, 13 J. Indian Acad. of Forensic Sci. 2 (1974).

¹⁹⁸ Puri at 45; Chatterjee at 2.

¹⁹⁹ Chatterjee at 2.

²⁰⁰ *Id.* at 3.

²⁰¹ Puri at 45.

²⁰² *Id.*

²⁰³ Courts do not typically perform validation studies. A legal opinion cannot provide evidence of validation unless that decision *refers* to some study or data that does provide validation. For more detail on this argument, see Simon A. Cole, ‘Implicit Testing’: Can Casework Validate Forensic Techniques?, 46 *Jurimetrics* 117 (2006).

in favor of the uniqueness of friction ridge skin, which, again, invokes the fingerprint examiner's fallacy and fails to address the validity of latent print individualization.

With more resources, I could go through the whole list. However, at this point I am convinced that it is extremely unlikely that the *Mitchell* bibliography contains a hidden gem that demonstrates the validity of latent print individualization. I suspect that if there were such a gem, the government would have pointed it out in *Mitchell* or a subsequent case. Therefore, at this point, I am willing to take the risk of being proven wrong.

The anatomical literature cannot provide evidence in support of the general acceptance of latent print individualization. Moreover, anatomists do not constitute the relevant scientific community for the matter of the validity of latent print individualization for the simple reason that they have evinced in their published literature no interest whatsoever in this question. Anatomists are the relevant scientific community for questions that do fall within their interest and expertise, such as: How is friction ridge skin formed? What is its biological function? To what degree are friction ridge skin patterns inherited? Do certain friction ridge patterns correlate with disease or behavioral propensities or ethnic groups? But, if a court is interested in literature that addresses the validity of latent print individualization it is the (largely legal) literature listed in Table 3 and note 160 that it must turn.

C. Non-Novelty

A common argument that holds that the Frye test only applies to "novel" expert evidence. Therefore, it is assumed, even if latent print individualization would fail a general acceptance analysis, it would not reach that analysis because it is not novel

evidence. Since *Frye* postdated the introduction of latent print evidence to U.S. courts by more than two decades,²⁰⁴ that would mean that latent print evidence was never properly the subject of *Frye* analysis. The supposed non-novelty loophole has probably been one of the chief deterrents to admissibility challenges to latent print evidence under *Frye*.

In fact, the non-novelty loophole should not be treated as an obstacle to challenging the admissibility of latent print evidence under *Frye*. First, the notion that *Frye* limited itself to novel evidence is a myth. The *Frye* opinion contains no reference to novelty. Instead, it has been suggested that the notion that *Frye* is limited to novel evidence can be traced to a law professor.²⁰⁵

It is true that some state courts appear to have added a “novelty” requirement in their cases adopting *Frye*.²⁰⁶ Other courts have rejected the novelty requirement.²⁰⁷ But even some courts with a novelty requirement, such as the California Supreme Court, have interpreted it to refer not merely to new techniques, but also to new information about the general acceptance, or even reliability, of even time-honored techniques. *Kelly* states that the non-novelty loophole remains open only “until new evidence is presented reflecting a

²⁰⁴ *People v. Jennings*, 96 N.E. 1077 (Ill. 1911).

²⁰⁵ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 299 (2004); James E. Starrs, *Frye v. United States Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702*, 26 *Jurimetrics* 249, 252 (1986).

²⁰⁶ *See, for example*, *Donaldson v. Central Illinois Public Service Co.*, 767 N.E.2d 314 (Ill. 2002); *People v. Basler*, 740 N.E.2d 1 (Ill. 2000); *In re Marriage of Alexander*, 857 N.E.2d 766 (App. Ct. 5th Dist. 2006); *In re K.T.*, 836 N.E.2d 769 (App. Ct. 1st Dist. 2005); *In re Commitment of Bushong*, 815 N.E.2d 103 (App. Ct. 2d Dist. 2004); *People v. Canulli*, 792 N.E.2d 438 (App. Ct. 4th Dist. 2003); *In re Commitment of Simons*, 821 N.E.2d 1184 (Ill. 2004); *People v. Cumbee*, 851 N.E.2d 934 (Ill. App. Ct. 2d Dist. 2006); *Owens Corning v. Bauman*, 726 A.2d 745, (Md. 1999); *People v. Kelly*, 549 P.2d 1240 (Cal. 1976).; *State v. Meador*, 674 So. 2d 826 (Fla. Dist. Ct. App. 4th Dist. 1996); *U.S. Sugar Corp. v. Henson*, 2000 WL 1880340 (Fla. Dist. Ct. App. 1st Dist. 2000); *Still v. State*, 917 So. 2d 250 (Fla. Dist. Ct. App. 3d Dist. 2005); *Dirling v. Sarasota County Government*, 871 So. 2d 303 (Fla. Dist. Ct. App. 1st Dist. 2004); *State v. Sercey*, 825 So. 2d 959 (Fla. Dist. Ct. App. 1st Dist. 2002).

²⁰⁷ *Gilbert v. DaimlerChrysler Corp.*, 685 N.W.2d 391 (Mich. 2004).

change in the attitude of the scientific community.”²⁰⁸ A litigant could demonstrate the existence of such new information, as explicated above, and such an interpretation would, therefore, allow a *Frye* challenge to latent print individualization evidence. Legal scholars agree that “the novelty requirement should not bar relitigation if the scientific community changes its mind when further research reveals that a previously trusted technique no longer is valid.”²⁰⁹ This is precisely the case for latent print evidence. Indeed, the courts’ openness to “new evidence reflecting a change in the attitude of the scientific community” is particularly pertinent to the case of latent print evidence where only the publicity attendant to the *Llera Plaza* case drew the attention of the mainstream scientific community to the issue of the validity of latent print individualization. Finally, to the extent that courts do enforce a non-novelty loophole, they defy common sense, as legal scholars have pointed out.²¹⁰

IV. Frye Rulings

Astonishingly, there has yet to be a ruling that explicitly considers the admissibility of latent print individualization evidence under *Frye*. As discussed above, this glaring lacuna is probably due to several factors including the non-novelty loophole and the defense bar’s assumption that such challenges were only colorable under *Daubert*. There have, however, been some admissibility rulings in *Daubert* or mixed

²⁰⁸ *People v. Kelly*, 549 P.2d 1240 (Cal. 1976).; *Fishback v. People*, 851 P.2d 884, 891 (Colo.,1993).

²⁰⁹ Andrew E. Taslitz, *Does the Cold Nose Know? The Unscientific Myth of the Dog Scent Lineup*, 42 *Hastings L.J.* 15, 61 (1990); David H. Kaye et al., *The New Wigmore: Expert Evidence*, 300 (2004).

²¹⁰ David H. Kaye et al., *The New Wigmore: Expert Evidence*, 299 (2004); James E. Starrs, *Frye v. United States Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702*, 26 *Jurimetrics* 249, 253 (1986).

jurisdictions that have considered the issue of the general acceptance of latent print individualization.

Many courts have reasoned that latent print evidence satisfies the general acceptance requirement by restricting the relevant community to fingerprint examiners or to the forensic community.²¹¹ Some court have relied exclusively on general acceptance to find latent print evidence admissible under *Daubert*.²¹²

A. Commonwealth v. Patterson

The most extended discussion of general acceptance may be found in the Supreme Judicial Court of Massachusetts's ruling in *Patterson*.²¹³ The case was an unusual one in that it dealt both with the admissibility of latent print individualization testimony in general and with a particular application known as "simultaneous impressions."²¹⁴

²¹¹ See, for example, *United States v. Sullivan*, 246 F. Supp. 2d 700, 703 (E.D. Ky. 2003). ("The court finds that ACE-V is generally accepted in the fingerprint analysis and forensic science fields . . ."). While it would be difficult to dispute this assertions as concerns fingerprint examiners, it is far less clear that it is accurate as concerns the field of "forensic science" more generally. In any case, although the court noted that "The plaintiff's expert, Joy Younce, testified that ACE-V is the standard methodology used by fingerprint examiners in analyzing fingerprints," (emphasis added) it refers to no evidence about the state of general acceptance among forensic scientists; *United States v. Mitchell*, 365 F.3d 215, 241 (3d Cir. 2004).; *U.S. v. Collins*, 340 F.3d 672, 682 (8th Cir. 2003) ("Fingerprint evidence and analysis is generally accepted."); *United States v. Crisp*, 324 F.3d. 261, 268 (4th Cir. 2003). ("While the principles underlying fingerprint identification have not attained the status of scientific law, they nonetheless bear the imprimatur of a strong general acceptance, not only in the expert community, but in the courts as well."); *U.S. v. Abreu* 406 F.3d 1304, 1307 (11th Cir. 2005).

²¹² Michael J. Saks, *Reliability Standards: Too High, Too Low, or Just Right? The Legal and Scientific Evaluation of Forensic Science (Especially Fingerprint Expert Testimony)*, 33 Seton Hall L. Rev. 1167, 1181 (2003).

²¹³ *Commonwealth v. Patterson*, 840 N.E.2d 12 (Mass. 2005) (SJC-09478).

²¹⁴ The details of simultaneous impression identification need not concern us here, but it consists of aggregating consistent ridge detail from different latent prints when no one of those has latent prints has "sufficient" ("sufficiency" being an undefined concept in latent print analysis) ridge detail for identification. Such aggregation is, of course, only legitimate if it is known that the latent prints were laid down by a single hand—that is, "simultaneously" and not by different hands at different times. The ability of latent print examiners to distinguish between simultaneous and non-simultaneous sets of latent prints had never been measured at the tie *Patterson*, though one pilot study has now been conducted. John P. Black, *Pilot Study: The Application of ACE-V to Simultaneous (Cluster) Impressions*, 56 J. Forensic Identification 933 (2006).

Massachusetts is a mixed *Frye-Daubert* jurisdiction, but the decision in *Patterson* relied heavily on general acceptance. The court began by acknowledging that its own ruling in *Canavan* mandated that the relevant scientific community “be defined broadly enough to include a sufficiently broad sample of scientists so that the possibility of disagreement exists,” not “so narrowly that the expert's opinion will inevitably be considered generally accepted.”²¹⁵ This would seem to clearly call for extending the relevant scientific community beyond the narrow confines of practitioners. And, indeed, the court had before it, in the handy packaged form of an Amicus Curiae Brief, the views of the mainstream scientific community.²¹⁶

1. The Relevant Scientific Community in *Patterson*

At one point, the court appeared to claim that there were some “scientists” who accept latent print individualization, naming one: Professor Babler.²¹⁷ But, as the court acknowledged, Babler’s research concerns “the underlying premises of fingerprint examination,” not the validity of latent print individualization.²¹⁸ Indeed, as the court did *not* mention, Babler has never made any statement concerning the validity or accuracy of latent print individualization.

But, in the final analysis, the court did not rely on Babler, but instead simply excluded all scientists from the relevant community altogether and limited the

²¹⁵ *Id.* at 25.

²¹⁶ David M. Siegel et al., *The Reliability of Latent Print Individualization: Brief of Amici Curiae submitted on Behalf of Scientists and Scholars by The New England Innocence Project, Commonwealth v. Patterson*, 42 Crim. L. Bull. 21 (2006).

²¹⁷ *Patterson* at 24 n. 12.

²¹⁸ *Id.*

community to “practitioners.” Directly after acknowledging its own ruling in *Canavan*, the court then goes on to say

The judge properly ensured that the technical community in which latent fingerprint identification and ACE-V is generally accepted is broad enough to include “some *practitioners* who acknowledge flaws in the methodology” and tolerant enough to allow “some, albeit, limited room for dissent.”²¹⁹

Therefore, the court held, “Evidence of fingerprint individualization” is admissible because of general acceptance “by the fingerprint examiner community.”²²⁰ In so doing, the court simply ignored the fact that one of the *amici* on the Brief discussed *supra*, Mr. Acree, was, in fact, a latent print examiner. Thus, the court’s designation of the “relevant scientific community” was not really disciplinary, but merely ideological. Mr. Acree was presumably excluded from the relevant scientific community not because he wasn’t a practitioner—he was—but merely because he held the “wrong” opinion. This would seem to make a mockery of the *Frye* inquiry.

However, the court went on to rule that the trial court *did* abuse its discretion in admitting latent print evidence concerning simultaneous impressions. The government did not make a sufficient showing that simultaneous impressions were generally accepted within even the latent print practitioner community. But, even in excluding simultaneous impressions, the court emphasized its narrow definition of the relevant scientific community. It explicitly noted that it is the fingerprint community, not the broader scientific community, whose “general acceptance” would be necessary to render

²¹⁹ *Patterson* at 25, emphasis added.

²²⁰ *Id.* at 33.

simultaneous impression evidence admissible: “if the Commonwealth establishes that the application of ACE-V to simultaneous impressions is generally accepted *in the fingerprint examiner community*, the evidence is properly admitted.”²²¹

As evidence of its claim that the practitioner community was “broad” in and of itself, the court offered the following: First, the guidelines and standards developed by SWGFAST committees are subject to repeated discussion, critique, and debate *by the entire SWGFAST community and by members of the IAI*.”²²² Second, “Additional room for disagreement lies in the ongoing debate over how many points of similarity, if any, are needed to conclusively make a match.”²²³ Third, the court notes that some latent print examiners disapprove of the use of simultaneous impressions, the application of latent print analysis at issue in *Patterson*.²²⁴

The first assertion is, of course, laughable because the court has, in its very articulation of the latent print community’s supposed “breadth” and “tolerance” for dissent, acknowledged that is in fact quite clearly a closed community whose doctrines are not open to discussion by those who are not either members of the professional organization or to an elite appointed body, convened by the Federal Bureau of Investigation, that seeks to set voluntary practice guidelines for the profession (SWGFAST). The second two assertions speak to issues of debate within profession, but not to the fundamental validity of latent print individualization itself. Astrologers could make an equally persuasive showing of “breadth” by showing that astrologers disagree as to what particular practices should be used to answer particular questions, what particular

²²¹ *Id.* at 29, emphasis added.

²²² *Id.*, emphasis added.

²²³ *Id.*

²²⁴ *Id.*

astrological techniques should be used under what circumstances, how to interpret various astrological signs, and so on.

In *Patterson*, the court has fundamentally changed the meaning of the “breadth” principle. Whereas all the previous discussions of “breadth,” including the court’s own, conceive of breadth as extending the discussion beyond the practitioner community to the scientific community, in *Patterson* breadth has come to be defined by “tolerance” for dissenting views *within the practitioner community itself*. While “tolerance” for dissent within the practitioner community should certainly be a *sine qua non* for any expert community seeking to offer evidence in court (because it presumably indicates a healthy expert community), it is quite a different thing than acceptance in a broad community that includes outsiders, mainstream scientists, individuals with expertise in assessing and evaluating validation, and individuals lacking a vested interest in the technique. The court has essentially slipped “tolerance for dissent” in the place of “breadth,” and in so doing has thrown out its own breadth requirement, articulated in *Canavan*. In so doing, it chose to deliberately exclude the mainstream, disinterested scientists from the “relevant community.” Indeed, the court’s deliberate effort to exclude the scientific community is revealed by the subtle shift from the phrase “scientific community” in *Canavan* to “technical community” in *Patterson*. That, in *Patterson*, the court essentially eviscerates the breadth principle it articulated in *Canavan* should be clear. Again, astrologers can satisfy the requirement for “some, albeit, limited room for dissent.”

2. “Limited Room for Dissent”?

All of the above discussion, however, misses the hidden bombshell contained in Patterson court’s characterization of the tolerance for dissent in the latent print

community as “limited.” What, precisely, did the court mean when it said that room for dissent is “limited” in the latent print practitioner community? If it is a scientific community, or even a non-scientific professional community, why is room for dissent “limited”? If it is a community that serves the interests of justice, why is room for dissent “limited”? Why, if fingerprinting is as clear cut, as accurate, indeed as “infallible” as its proponents claim, is there a need to “limit” dissent in the practitioner community anyway? And, if latent print examiners constitute a community that limits dissent, wouldn’t that be all the more reason to consider the opinions of outsiders and not allow such a community to constitute a self-certified “relevant technical community”? Isn’t the suspicion that a community limits dissent be exactly the sort of situation that necessitates expanding the field of inquiry in the general acceptance analysis? The court blithely drops this little bombshell without so much as further comment.

Perhaps, in using the term “limited room for dissent,” the court had in mind some of the statements from latent print practitioners themselves that may be found among the exhibits submitted in the *Patterson*, attesting to the “dogmatic” and even “cultish” atmosphere within the latent print community. Perhaps it had in mind Ashbaugh’s statement:

In the past the friction ridge identification science has been akin to a divine following. Challenges were considered heresy and challengers frequently were accused of chipping at the foundation of the science unnecessarily. This cultish demeanor was fostered by a general deficiency of scientific knowledge, understanding, and self-confidence within the ranks of identification specialists. A pervading fear developed in which any negative aspect voiced that did not support the concept of an exact and infallible science could lead to its destruction and the destruction of the credibility of those supporting it.²²⁵

Or perhaps this:

²²⁵ David R. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology, 4 (1999).

The failure of the identification community to challenge or hold meaningful debate can also be partly attributed to the fact that the friction ridge identification science has been basically under the control of the police community rather than the scientific community. In the eyes of many police administrators, friction ridge identification is a tool for solving crime, a technical function, as opposed to a forensic science.²²⁶

Or perhaps it had in mind the following statement by Grieve, long the editor of the

Journal of Forensic Identification:

this categorical requirement of absolute certainty has no particular scientific principle but has evolved from a practice shaped more from allegiance to dogma than a foundation in science. Once begun, the assumption of absolute certainty as the only possible conclusion has been maintained by a system of societal indoctrination, not reason, and has achieved such ritualistic sanctity that even mild suggestions that its premise should be re-examined are instantly regarded as acts of blasphemy. Whatever this may be, it is not science.²²⁷

Such statements, coming from the technique's *own practitioners*, would seem to make the latent print community a poor choice for a practitioner community that is permitted to "self-certify" its own claims and exclude outsiders. Under these circumstances, the court's willingness to limit the "relevant community" to practitioners seems baffling, especially given the ready availability of the views of the mainstream scientific community.

V. Further Implications

This article has focused on the neglected issue of the admissibility of latent print evidence in *Frye* jurisdiction. While this should be of importance to those wrestling with the admissibility of latent print (and other forensic) evidence in those jurisdictions, the research reported here has implications that go beyond *Frye* jurisdictions and go beyond latent print evidence. The process of applying *Frye* to a single form of evidence has

²²⁶ *Id.*

²²⁷ David L. Grieve, *Possession of Truth*, 46 J. Forensic Identification 521, 528 (1996) (describing "shock" and "disbelief" "within the forensic science community" at the results of the 1995 test).

focused our attention on a number of important principles that should apply for *Frye* analyses of any evidence, including the problems with practitioner-only evidence, the importance of breadth, and the idea of the meta-expert.

A. Implications for Daubert Jurisdictions

As I have noted above, I have turned my attention from *Daubert* to *Frye* only reluctantly, due to my strong belief, a belief shared by the overwhelming bulk of legal scholarship on the issue, that latent print individualization evidence does not satisfy any reasonable application of Daubert. Nonetheless, the argument presented here for exclusion of latent print individualization evidence under the *Frye* rule may yet be of some relevance for consideration of the same evidence under the Daubert standard. Daubert still incorporates the general acceptance standard as one of the five factors designed to limn its “reliability” requirement. Thus, the case presented here demonstrates clearly that latent print individualization evidence fails to satisfy one of the five Daubert factors, and, moreover, it fails to satisfy the factor that it has widely been assumed it would have easiest time satisfying.

B. *Frye* or Daubert?

Although *Daubert* is frequently criticized, relatively few scholars, principally Professor Schwartz, have gone so far as to argue that *Frye* is actually preferable.²²⁸ Should this case study change our view on this question?

I have long argued that, in the understanding of the scientific basis of latent print individualization, *Daubert* has had a transformative effect.²²⁹ What is probably the

²²⁸ Schwartz, *supra* note X.

principal flaw in the arguments vouching for latent print individualization—the confusion between uniqueness and accuracy that I have labeled the “fingerprint examiner’s fallacy”—was not clearly enunciated until after the *Daubert* decision.²³⁰ It would not be going too far to suggest that *Daubert* had a salutary effect on the understanding the scientific basis underlying latent print individualization merely by prompting a renewed look at the evidence after nearly a century of “general acceptance.”

In addition, of course, *Daubert*’s focus on reliability sharpened the questions that were asked and focused attention of the crucial, and hitherto neglected, issue of validity. That pilot accuracy studies are now being undertaken, after a century of use of the technique in court, may to some extent be ascribed to the influence of *Daubert*.²³¹ Thus, the principal merit of *Daubert* has been symbolic, in compelling various legal system actors to look more closely and more searchingly at many types of evidence that have long been taken for granted. But these searching inquiries have not necessarily generated rigorous admissibility rulings.

As demonstrated above, *Daubert*’s celebrated vagueness has essentially allowed trial judges free rein to enact their instincts. One undervalued virtue of *Frye* is that, however vague it may be, it is less vague than *Daubert*. At some point, the existence of general acceptance becomes difficult to fudge, especially if the principles enunciated above, against practitioner-only acceptance and for breadth, are adhered to. My principal

²²⁹ Simon A. Cole, *Jackson Pollack, Judge Pollak, and the Dilemma of Fingerprint Expertise*, in *Expertise in Regulation and Law* 98 (Edmond ed., 2004).

²³⁰ David A. Stoney, *Fingerprint Identification: Scientific Status*, in *Modern Scientific Evidence: The Law and Science of Expert Testimony* 55 (Faigman, et al. eds., 1997); Fred Woodworth, *A Printer Looks at Fingerprints*, *The Match!* 36, (Winter, 1997).

²³¹ Kasey Wertheim et al., *A Report of Latent Print Examiner Accuracy During Comparison Training Exercises*, 56 *J. Forensic Identification* 55 (2006).

reason for skepticism about Professor Schwartz's embrace of *Frye* lay in my sense that it would be too receptive to closed communities, despite Professor Schwartz's and some courts' efforts call for a broad interpretation of *Frye*. It would appear, however, that applying *Frye*'s notion of the "relevant scientific community" is not necessarily any more difficult than applying *Daubert*'s notion of reliability.

This discussion would seem to support the emerging scholarly view that *Frye* and *Daubert* are not as different as scholars have previously assumed. Most evidence that fails *Daubert* should probably fail *Frye* and vice versa. Indeed, this case study shows that even one of Professor Saks's prime examples of a technique that satisfied *Frye* and failed *Daubert* actually fails *Frye* too, at least once a community of meta-experts has been constituted.²³² The difficulties appear to lie not so much with which admissibility standard is chosen, but in operationalizing either standard in an even-handed manner.²³³

C. The Clash of the Legal and Scientific Communities

By showing the lack of general acceptance of the validity of latent print individualization, this articles raise a larger issue that transcends the narrow question of legal admissibility: the disconnect between the legal and scientific communities as concerns the validity of latent print individualization. The evidence assembled above clearly demonstrates that members of the scientific community do not accept that the validity of latent print individualization has been established. And yet, paradoxically, not

²³² Michael Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science*, 49 Hastings L.J. 1069 (1998).

²³³ D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 Alb. L. Rev. 99 (2000); Susan Haack, *Trial and Error: The Supreme Court's Philosophy of Science*, 95 Am. J. Pub. Health S66 (2005); Margaret A. Berger, *What Has a Decade of Daubert Wrought?*, 95 Am. J. Pub. Health S59 (2005).

a single court has endorsed this view. To the contrary, courts have tended to uphold the admissibility of latent print individualization with ringing pronouncements about its validity. As I have noted elsewhere, these pronouncements have come to stand in for scientific validation when proponents of latent print individualization are called upon to justify their claims.²³⁴ Indeed, courts have essentially *become* the “relevant scientific community” for latent print evidence, a fact they sometimes inadvertently acknowledge when they discuss “general acceptance” as if were something conferred by courts themselves, rather than by an external expert community.²³⁵ What might “acceptance” in the “judicial” community mean, other than following precedent? Such reasoning turns a *Frye* analysis into an exercise in following legal precedent, rather than the referral to an external expert community that stands at the heart of *Frye*. Moreover, courts’ upholding of the admissibility of latent print evidence has required them to essentially deem irrelevant the views of the scientific community.

It is difficult to think of comparable examples of scientific issues upon which the legal and scientific communities stand in such stark and dramatic disagreement. Will courts continue to hold out against the view of the scientific community? Will the scientific community become more aggressively interventionist? The recent formation of a panel on forensic science by the National Academies, the most prestigious and credible

²³⁴ Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again*, 41 Am. Crim. L. Rev. 1189 (2004).

²³⁵ *United States v. Crisp*, 324 F.3d. 261, 268 (4th Cir. 2003). (discussing “general acceptance, not only in the expert community, but in the courts as well.”); *Id.* at 269 (referring to “the consensus of the expert and judicial communities that the fingerprint identification technique is reliable.”); Megan J. Erickson, *Daubert's Bipolar Treatment of Scientific Expert Testimony--From Frye's Polygraph to Farwell's Brain Fingerprinting*, 55 Drake L. Rev. 763, 809 (2007). (“The courts willingly overlook the subjectivity inherent in latent fingerprint evidence testimony because of what the court considers to be its own ‘general acceptance’ (even if ‘general acceptance’ means within the judicial community, rather than scientific community)”).

scientific organization in the United States, raises the possibility of a more forceful intervention on behalf of the scientific community. But whether and to what extent the panel will directly address the issue of validity remains to be seen.

Table 1. General acceptance of the validity of latent print individualization among non-practitioners based on expert testimony, c. 1999.

No.	Name	Title	Affiliation	Degree	Institution	Discipline
<u>Acceptors</u>						
1.	Bruce Budowle		Federal Bureau of Investigation	PhD		Biology
<u>Non-Acceptors</u>						
1.	James Starrs	Professor	The George Washington University School of Law and Forensic Science Program	BA	St. John's University	English
2.	David Stoney	Director	McCrone Institute	PhD	University of California, Berkeley	Forensic Science
3.	Simon Cole	Postdoctoral Fellow	Institute for Health Care Policy, Rutgers University	PhD	Cornell University	Science & Technology Studies

Table 2. General acceptance of the validity of latent print individualization among non-practitioners based on *Amicus curiae* Briefs, c. 2005.

No.	Name	Title	Affiliation	Degree	Institution	Discipline
<u>Acceptors</u>						
None						
<u>Non-Acceptors</u>						
1.	Mark Acree	Principal	Apex Consulting	MSFS	University of Alabama, Birmingham	Forensic Science
2.	Robert Bradley	Professor	Illinois State University	PhD	University of Kentucky	Political Science
3.	David Faigman	Professor	Hastings School of Law	MA, JD	University of Virginia	Psychology; Law
4.	Stephen Fienberg	Maurice Falk Professor	Carnegie Mellon University	PhD	Harvard University	Statistics
5.	Paul Giannelli	Richard Weathered Professor	Case Western University School of Law	MS, JD, LLM	The George Washington University; University of Virginia	Forensic Science; Law
6.	Lyn Haber	Principal	Human Factors Consultants	PhD	University of California, Berkeley	Linguistics
7.	Ralph Haber	Professor Emeritus	University of California, Santa Cruz	PhD	Stanford University	Psychology
8.	Donald Kennedy	Professor; President Emeritus	Stanford University	PhD	Harvard University	Biology
9.	Jennifer Mnookin	Professor	University of California, Los Angeles	PhD; JD	MIT; Yale University	Science & Technology Studies; Law
10.	Joëlle Anne Moreno	Professor	New England School of Law	JD	University of Pennsylvania	Law
11.	Jane Moriarty	Professor	University of Akron School of Law	JD	Boston College	Law
12.	D. Michael Risinger	Professor	Seton Hall School of Law	JD	Harvard University	Law
13.	John Vokey	Professor	University of Lethbridge	PhD	McMaster University	Psychology
14.	Sandy Zabell	Professor	Northwestern University	PhD	Harvard University	Mathematics

Table 3. General acceptance of the validity of latent print individualization among non-practitioners not listed in Table 1 or 2 based on published literature.

No.	Name	Title	Affiliation	Degree	Institution	Discipline	Publication
<u>Acceptors</u>							
1.	André Moenssens	Douglas Stripp Professor of Law	University of Missouri, Kansas City	JD, LLM	Illinois Institute of Technology; Northwestern University	Law	<i>Criminal Justice</i>
2.	Stephen Stigler	Ernest DeWitt Burton Distinguished Service Professor	University of Chicago	PhD		Mathematics	<i>Genetics; Issues in Science & Technology</i>
<u>Non-Acceptors</u>							
1.	Nathan Benedict	Law student		JD	?	Law	<i>Arizona Law Review</i>
2.	Margaret Berger	Professor	Brooklyn Law School	JD	?	Law	<i>American Journal of Public Health</i>
3.	Robert Epstein	Attorney	Federal Defender	JD	Harvard University	Law	<i>Southern California Law Review</i>
4.	David Kaye	Professor	Arizona State University School of Law	JD	?	Law	<i>Quinnipiac Law Review; International Statistical Review</i>
5.	Tara Marie La Morte	Law student		JD	?	Law	<i>Albany Law Journal of Science & Technology</i>
6.	Tamara Lawson	Professor	St. Thomas School of Law	JD	?	Law	<i>American Journal of Criminal Law</i>
7.	Michael Saks	Professor	Arizona State University School of Law	PhD	Ohio State University	Psychology	Numerous law review articles, <i>Modern Scientific Evidence</i>
8.	Katherine Schwinghammer	Law student		JD	?	Law	<i>American Journal of Criminal Law</i>
9.	Jessica Sombat	Law student	Fordham University School of Law	JD	Fordham University	Law	<i>Fordham Law Review</i>
10.	Michael Mears & Therese Day	Attorneys	Georgia Multi- County Public Defender	JD	University of Georgia/ University of Arizona	Law	<i>Georgia State Law Review</i>