

A Reply to

"Forensic Pattern Identification: A History Lesson, and Some Advice, for Saks & Faigman"

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Editors' Note: In their original submission, the authors of this commentary referred to *Crime Lab Report* as "anonymous." For the benefit of our readers, this was changed throughout the document. The members of *Crime Lab Report's* editorial board are listed at the *Crime Lab Report* website.

Crime Lab Report's column prompted by our chapter, "Failed Forensics: How Forensic Science Lost its Way and How It Might Yet Find It," in the Annual Review of Law and Social Science (2008), is difficult to respond to. *Crime Lab Report's* scattershot arguments are aimed in so many directions that it often is hard to know what we said that *Crime Lab Report* is trying to refute. Many of the arguments are so loopy-goopy, if not altogether irrelevant, to any issue of significance to our chapter or to the justice system that an effort to respond comprehensively is both pointless and impossible.

For example, *Crime Lab Report* asserts that "If DNA analysts could observe and compare DNA with their own eyes they would do it." Let's say this is completely true. So what? The issues we raised have nothing to do with how visualization is achieved (whether by the naked eye or by complicated instrumentation to produce images that can be compared). Take another one: "Universities do not have a monopoly on science." We never suggested otherwise. Indeed, we said that forensic identification specialties could have (and should have) become scientific, but they did not. We suggested that more active collaboration with university-based researchers would have helped make up for that past lack and could help place (what NIJ has referred to as) the soft forensic sciences on a more solid foundation in the future. Does *Crime Lab Report* seriously doubt that?

Often the loopy-goopy reasoning proceeds from asserted historical facts. Galton did the early (and ingenious) work that he did on fingerprints. But that does not ipso facto establish any scientific fact that is of consequence to our arguments. His "methods for studying variations in the human population" had nothing to do with "the growth of latent print identification as we know it." Galton would be quite surprised to learn that he established the validity of fingerprint identification. Galton never believed that fingerprints were adequate for criminal individualization, and said so in reports requested of him by the British government (in which he expressed greater confidence in anthropometry than in fingerprints). (Cole, 2001.)

Some of *Crime Lab Report's* responses are perplexing. To our complaint about a paucity of research testing fundamental propositions, *Crime Lab Report* triumphantly asserts that research contradicting the claims of forensic examiners cannot be proffered, "Because it doesn't exist." If we are right that a major problem is that research has not been undertaken, then *of course it does not exist*.

Other arguments *Crime Lab Report* makes cut against his/her own position. *Crime Lab Report* alludes to work of the founding fathers of some areas of forensic individualization and to more recent biometric research as somehow supporting the extreme claims that many forensic expert witnesses make in courts today. But the work of the founders and the biometricians is built on probabilistic reasoning, and (of the biometricians) on systematic empirical methods. Those, we have argued, are the most defensible ways to conceive of forensic identification and is the conception that practitioners need to come into line with. Meanwhile, most practitioners in most areas assert unique individualization (which no existing research can justify). In fact, Champod, whom *Crime Lab Report* praises, has made a point quite similar to our own about the gap between science and rhetoric in forensic identification, questioning the "major contradiction between the scientific status that is claimed and the operational paradigm to which its practitioners subscribe." Champod asks whether "a statement of an 'absolute conclusion' [can be] compatible with scientific reasoning" and whether "the denial of probabilistic reasoning [can be] compatible with a scientific pursuit," answering that such a denial is both illogical and unscientific. (Champod & Evett, 2001.)

But let's see if we can focus on one large and important question that we think *Crime Lab Report* has locked horns with us on, and offer a substantive answer to it.

Crime Lab Report argues (in support of the extreme claims of forensic individualization which we have questioned) that much research establishing the reliability and validity of those claims exists, that those claims are supported by "overwhelming factual evidence," that they have "developed over a long period of time during which many competent researchers attempted to falsify the underlying hypotheses and failed," and that we would have found those studies if only we had looked harder.

In contrast, we have argued that research on those questions has risen from essentially non-existent to now being a paucity. So dramatic and extreme a claim as individualization (unknown in virtually all, if not literally all, other fields of science), requires some powerful evidence or compelling logic to persuade a thoughtful audience of its truth. Anecdotal impressions by practitioners will not suffice. Vague and sweeping references to unnamed studies is not enough.

For this forum, with its limited opportunity to provide details, we offer the following items in support of our argument that the requisite evidence has not yet been developed:

1. An NIJ RFP (2000) seeking proposals to conduct "fingerprint examination validation studies" stated: "The participants in the [National Institute of Justice Fingerprint Advisory Committee] included practicing latent print examiners, researchers, and senior administrators from Federal, State, and private forensic science laboratories. They reached a consensus that the field needs... [b]asic research to determine the scientific validity of individuality in friction ridge examination based on measurement of features, quantification, and statistical analysis."
2. In the first case involving challenges to the claims – and therefore the admissibility – of fingerprint expert testimony, under Daubert, the government offered only two empirical studies, both of which had been conducted in the pretrial stages of that very

trial. One of them was so flawed (if not fraudulent) that its FBI authors retreated from calling it a study. The second, by Lockheed Martin on the FBI's fingerprint database, was never published and has been quite soundly criticized as not being able to support what it claimed to prove. (Kaye, 2003.) On the scientific claims, the court ultimately concluded that the proponent of the admission of fingerprint evidence had failed to meet Daubert's first factor (testing) (even though the court eventually allowed the testimony). In not one of the dozens of judicial opinions that we have read from Daubert hearings on fingerprints does it appear that the proponent has been able to produce empirical studies in support of the basic claims of the field of fingerprint identification, much less the wealth of studies that Crime Lab Report claims exist. Indeed, in *United States v. Havvard*, the federal district court cited "100 years of adversarial testing" to support the "testability" prong of Daubert, having been presented with no studies by the proponents of the testimony.

Given the above two items, Crime Lab Report (if correct) has laid a devastating indictment against the NIJ's Fingerprint Advisory Committee, the FBI Crime Lab, the U.S. Department of Justice, and a bevy of federal courts and the experts who sought to testify before them.

3. Every founder of every forensic identification subfield (other than DNA typing) relied on probabilistic arguments (not data), which by definition do not suffice to establish the capability to achieve unique individualization. (Saks, 1998; Saks & Koehler, 2005)

4. Numerous prominent forensic and other scientists have concluded, with us (though it is really we who rely on them), that the research necessary to establish what is needed to properly claim the ability to individualize simply does not yet exist. (Numerous of them are quoted and cited in Saks & Koehler, 2008.) Some forensic scientists have urged their field to mobilize to develop the necessary empirical support. For example: Inman & Rudin (2001) have called on the forensic science community "to produce a body of empirical work that can support that pragmatic leap of faith to a conclusion of a single common source."

5. Studies which have thus far been conducted on DNA exoneration cases have found errors or exaggerations by forensic examiners to be implicated in more erroneous convictions than any other kind of evidence except errors by eyewitnesses (See Saks & Koehler, 2005; Garrett & Neufeld, 2009).

6. On the field of fingerprint identification: "The criteria for absolute identification in fingerprint work are subjective and ill-defined. They are the product of probabilistic intuitions widely shared among fingerprint examiners, not of scientific research. This generally is unappreciated." (Stoney, 2006.)

7. On the field of handwriting identification: "Document examiners have not done the kind of empirical research that could have and should have been done.... On that the critics are absolutely correct." (Moenssens, 1997.) There is "indeed a dearth of published empirical information relating to the proficiency of document examiners...." (Moenssens, 1998). There is an "admittedly sparse history of carefully controlled empirical studies." "... there certainly has been a shortage of studies..." (Galbraith et al., 1995) A thorough

review of the first century or more of studies testing the ability of handwriting experts to perform the tasks that they claim to be able to perform at the level of accuracy they claim to perform it found one published and five unpublished studies (Risinger et al. 1989).

8. On bitemark identification: "This article presents a discussion of the scientific basis for human bitemark analyses." "The review revealed a lack of valid evidence to support many of the assumptions made by forensic dentists during bitemark comparisons." (Pretty & Sweet, 2001).

9. On firearms and toolmark identification: In 2008, the National Academies of Science, the most prestigious scientific organization in the United States, published a report on the feasibility of creating a national ballistic database. NIJ sponsored the report. Although it was not specifically within the charge of the Committee to advise the courts on the admissibility of firearms-related toolmark evidence, it could not avoid considering the scientific bona fides of the basic claims made in this field. On one of the more basic claims that forensic scientists make, the NAS Committee concluded that the "validity of the fundamental assumption of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated." The NAS Committee went on to comment that "[a] significant amount of research would be needed to scientifically determine the degree to which firearms-related toolmarks are unique or even to quantitatively characterize the probability of uniqueness." Unfortunately, such work has yet to be done. A new NAS report on forensic identification more generally is expected soon. It too is likely to share our lament – indeed, the lament of just about every reputable scientist who has ever delved into the details of forensic identification practice – regarding the paucity of research in this area, especially as compared to the ambitious claims made by most of those who practice it.

The above seem to more than bear out the conclusions of Giannelli & Imwinkelried, who wrote: "All the areas of forensic science discussed in this article [that is, various pattern recognition subfields] share two common denominators: In each area little rigorous, systematic research has been done to validate the discipline's basic premises and techniques, and in each area there is no evident reason why such research would be infeasible."

Crime Lab Report made one statement with which we agree wholeheartedly: "[P]ractitioners must exercise professionalism, caution, and self-restraint so that they do not stray beyond what the accumulated knowledge can justify." That is precisely what our most practical and immediate suggestion has been for forensic identification expert witnesses: stay within the bounds of what is known to be true – not what has been imagined, or hoped, or hyped. Crime Lab Report might profit from pondering that same lesson.