Focus Group on Scientific and Forensic Evidence in the Courtroom

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Introduction

In furtherance of the mission of the National Institute of Justice (NIJ) to develop, conduct, direct, and supervise research and evaluation activities through intra- and extramural research,[1] NIJ convened a focus group to cultivate an understanding of the issues surrounding scientific and forensic evidence in the courtroom. Representatives from practice, academia, and other relevant areas were invited to the June 25, 2007, meeting to share experiences, thoughts, and opinions as well as to comment on those of others. The result was an informative discussion that touched on many issues and questions concerning the current and future use of scientific and forensic evidence in the courtroom.

This report provides a summary of the focus group discussion. Findings and conclusions reported here are those of the focus group participants in the aggregate and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

In the first section, a brief synopsis of the meeting's most prominent discussion themes provides a general overview of the issues discussed. The "Specific Issues" section provides the context in which the group arrived at an understanding of both the general and specific issues concerning forensic science. The issues and suggestions that emerged from the discussion are then cataloged in the "Next Steps" section. The appendixes provide a list of the focus group's participants, the meeting's agenda, a juror decisionmaking tree, and a list of other innovative trial practices as well as a list of additional resource materials.

[1] These goals can be found on NIJ's Web site: www.ojp.usdoj.gov/nij/about.htm

Meeting Synopsis

Several common themes emerged from the focus group's discussion. Much of the discussion centered on validity testing, expert presentation, and education.

Validity testing within the forensic science disciplines was a major topic of conversation for the group. In particular, group members suggested that the exclusively crime-solving or "soft" sciences (including handwriting analysis, fingerprints, firearms identification, bite marks, microscopic hair comparisons, and voiceprints) might have the most to gain from such validity testing. The group also discussed the use and development of accurate probability assessments, evidence lineups, and blind testing to counter the effect of any contextual influences and to reduce the possibility of scientific error due to human factors.

Beyond the issue of the validity of various aspects and elements of the forensic sciences, the focus group raised the issue of the manner in which experts present their findings. Forensic science can be a complicated and confusing topic, making it an inherently difficult subject to present to a lay audience. There was general agreement by group members that how forensic sciences are presented in court is a critical component of the judge and jury developing a proper understanding of the forensic evidence. It was expected that the variety of evidence heard by a judge, the sequence in which experts testify, and the specific phrasing and characterization of the evidence by the experts can have a tremendous impact on the judge's and jury's comprehension. Some members of the focus group suggested that litigants may occasionally determine it is in their own best interest to keep the forensic evidence confusing in court, complicating matters further.

The group's frequently suggested solution for overcoming the confusion associated with forensic evidence was further education for virtually every actor in the court process: educating law students on how to question scientific assumptions while still in law school; educating experts on how to clearly convey dense and technical information to a lay audience without losing important details; educating attorneys on the laws concerning expert testimony as well as the most effective methods of presenting and responding to expert testimony; educating jurors on technical issues by providing an unbiased tutorial; and educating judges on the basics of a given science, effective procedures and regulations for expert presentations, and resources for determining when science is conclusive (as opposed to science that is still evolving).

Ultimately, the group agreed it would be beneficial to reach a reconciliation between the law and science. The two are completely distinct disciplines; the law requires consistent application, whereas science is based on constant revisions and discoveries. Group members suggested that these differences inevitably lead to the law lagging behind new scientific knowledge. Despite this dilemma, the group concurred that science and the law would greatly benefit from finding ways to improve communication across these two disciplines. Until that time, the central question of science in the courtroom is: "How do legal standards for scientific expert testimony work in a world where science continues to develop?"

Specific Issues

The issues of validity testing, expert presentations, and education, identified in the "Meeting Synopsis" section, were some of the major themes of the group's discussion, but they do not represent every issue raised. In this section, the meeting's content is presented in detail to provide a context and summary of all of the issues that arose from the group's discussion.

What follows is a summary of the ideas, understandings, and issues presented and discussed among the focus group members. In an effort to clarify the meeting's content, this portion of the report is divided into two sections: *The Forensic Sciences* and *The Courtroom.* As previously noted, the material presented in this report summarizes the focus group discussion only and does not represent the views of the U.S. Department of Justice; neither should it be assumed to provide all-inclusive coverage of this topic area.

The Forensic Sciences

The admission of forensic science evidence and expert testimony is largely concerned with the science itself, according to focus group members. Science is an ever-changing amalgam of new ideas and findings, wherein the new concepts are tested against the old concepts to develop and improve previous understandings of the science involved. Given this process, the group agreed that there are often legitimate arguments for at least two sides of every scientific issue, making it difficult to definitively assess the current scientific understanding of a particular issue at any given time. As a result, the courts have developed standards through which courthouse actors can determine whether a particular piece of scientific evidence or expert testimony should be admitted. The focus group discussed each of these standards as noted below.

Standards – *Frye* vs. *Daubert*

Legal experts in the focus group provided an overview of the legal landscape surrounding the admission of scientific evidence in the court. This section briefly outlines the background provided on the standards and the discussion that took place.

Generally, scientific evidence is evaluated through one of two standards: the *Frye* standard,[2] which considers the consensus among the relevant experts; and the *Daubert* standard,[3] which relies on the judge's assessment of the expert's qualifications and the validity of the methodology used. The *Frye* standard allows the court to take either a narrow interpretation, in which only the consensus among experts in the specific field is considered, or a broad interpretation, in which the opinions of experts in related fields are also weighed in the consensus. When the narrow interpretation is used, the evidence and testimony are typically admitted; on the other hand, a broad interpretation of the *Frye* standard is more likely to lead to the exclusion of forensic evidence and testimony.

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[2] *Frye* vs. *United States*, 293 F. 1013 (DC Cir 1923).

[3] *Daubert* vs. *Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).

Given the different criteria of the two standards, they can each lead to different determinations of admissibility for the same evidence. For instance, some forms of evidence are valid even if they are not yet generally accepted. Those new forms of scientific evidence, when built upon a strong foundation, may be allowed under *Daubert* but excluded under *Frye* if the science is too new to have formed a consensus within the relevant scientific community. Conversely, *Frye* may admit long-accepted forms of scientific evidence when there is a consensus, even if the foundation is weak, while *Daubert* would exclude the evidence because of the unconvincing scientific foundation.

Focus group members recognized that the wide variability in application of these standards, due to judges' subjective determinations of the current state of science, can provide the opportunity for judges to justifiably accept or reject scientific evidence as they choose. In applying *Daubert*, group members suggested that courts tend to treat evidence differently if it was well accepted long before the *Daubert* standard would have called for its exclusion.

Group members pointed out that some judges may seem comfortable with changes in law but may be less sure how to view changes in scientific understanding. Unfortunately, although knowledge in some fields of forensic science is well established and in others it continues to change, these judges are likely to continue to be frustrated by changes in the science that could have led to different case outcomes.

The next section summarizes the focus group's discussion of why some sciences may be seen as less well established than others.

The "Soft" and "Hard" Forensic Sciences

Focus group members noted that the field of DNA testing, as a forensic science, faced a very high level of scrutiny when first introduced to the courts. Attorneys and experts often challenged the new science in order to avoid the admission of misleading or ambiguous evidence. Unlike many of the other sciences commonly used in court, the scientific foundation supporting the study of DNA was bolstered by research from academic laboratories exploring genetics and biochemistry. This research, with no connection to forensic science and not necessarily intended for use in court, demonstrated just how convincing scientific evidence could be. DNA testing survived court challenges and, in the process, effectively "raised the bar" of scientific rigor for all forensic science evidence. Focus group members agreed that some of the other forms of forensic evidence, though long accepted, have had difficulty satisfying the informal threshold set by DNA testing because they have not been supported by purely academic research.

The distinction between the "soft" and "hard" sciences was another topic of discussion by focus group members. Several of the forensic sciences (such as handwriting analysis, fingerprints, firearms identification, bite marks, microscopic hair comparisons, and voiceprints) have been referred to as "soft sciences" because of their purported lack of a convincing scientific foundation, relative to DNA, which may be considered a "hard science" because of its high degree of scientific rigor. Similarly, in a 2007 *New Yorker* article, Jeffrey Toobin drew the same distinction between the two

types of forensic sciences.[4] Group members noted that the foundations of the soft sciences frequently have suffered from a lack of probabilistic studies. Thus, claims made by many of the soft science experts, such as “no two fingerprints are the same,” may be considered by some to be vulnerable to challenge.

Group members indicated that scientific evidence and testimony may be challenged in court on either the specific application in a given case or on the basic assumptions of the particular forensic science. For example, a crime scene investigator or lab technician can just as easily break the proper chain of custody or mislabel a DNA sample as they can with a ballistic or impression sample, but even if the latter forms of evidence are properly collected, there are still problems with their use in court. All forms of forensic evidence are susceptible to errors in application, but the soft sciences are expected to be more vulnerable to attacks on the scientific basis of the expert’s conclusions.

Some focus group members made the point that cross-examination is usually sufficient to reveal the strengths and weaknesses of any scientific evidence to the judge and jury. Others noted that cross-examination can also be used to intentionally confuse these individuals. Still others indicated that the evidence and testimony forensic experts offer are supposed to be scrutinized rather than uncritically accepted, and attorneys can present supporting and contradicting arguments to aid this scrutiny. Regardless, there still appear to be opportunities for challenges to expert presentation that are not seized upon. For instance, the scientific basis for fingerprint evidence probably could be challenged in many situations, but isn’t. Even in the few instances in which fingerprints have been challenged, most courts have admitted them into evidence.[5] The focus group members agreed that, in order to make challenges to the presentation of scientific evidence successful, an attorney must be well educated in both the relevant science and the law.

A number of the focus group members called for further research on the reliability of fingerprint evidence. Several members noted that current automated fingerprint identification systems contain significant data that researchers could use, for example, to determine the probability of a genuine match based on various numbers of points of correspondence. Similarly, others in the group suggested that research on other "soft sciences" could provide valuable assessments of their validity by examining ways to reduce error rates that could result from human and methodological problems.

As more research is conducted on the forensic sciences and forensic evidence, courtroom actors may become better informed about what should be accepted under the law and what should not.

The next section describes the focus group discussion regarding the best methods for educating these courtroom actors about the most recent research in the

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[4] Toobin, Jeffrey. “The CSI Effect: The Truth About Forensic Science.” *The New Yorker* (May 7, 2007): 30–35.

[5] An example of an exception is the May, 2007 Frye hearing in “STATE OF MARYLAND v. BRYAN ROSE IN THE CIRCUIT COURT FOR BALTIMORE COUNTY, Case No.: K06-0545.”

forensic sciences, and how some stages of the justice system may be unexpectedly influenced by forensic science.

The Courtroom

One of the central issues identified by the focus group regarding forensic science in the courtroom is to what extent the judge and jury understand the evidence. If their understanding is accurate, they are more able to apply the relevant legal standards in the given case. However, developing a proper understanding of forensic evidence can be difficult.

The previous section outlined focus group discussion on how the forensic sciences, particularly the so-called “soft” sciences, are increasingly vulnerable to subjective interpretation, which may be based upon unconvincing yet accurate scientific assumptions. This section summarizes the discussion around the impact of those concerns on courthouse actors and processes. First, the various forms of evidence presentation and education and training that judges, juries, and attorneys receive are described. Then, the possible effects of the forensic sciences on other justice system processes, such as pretrial plea bargaining and civil cases, are discussed. Focus group members emphasized that accuracy in the presentation of evidence is vital. They therefore advocated more judicial education and more novel presentations to assist jurors in understanding scientific methodologies.

Characterization and Presentation of the Evidence

The method of presentation of forensic science testimony can be very important to a judge’s or jury’s understanding of the evidence. Focus group members suggested that, in some instances, the forensic evidence may be the only source of information these individuals have to rely upon to ascertain guilt. In such circumstances, experts can have the difficult task of explaining sometimes very complicated forensic science to a lay audience; the judge and jury can then have the difficult task of understanding and interpreting often conflicting technical testimony. Judges can have an even more pressing need to comprehend the expert’s testimony and determine what expert evidence may be admitted and considered by the jury. Considering the potential probative value of such testimony, it is important that the expert accurately convey the true value of the evidence.

Group members expressed concern that some experts may phrase their conclusions in a manner that overstates or implies a higher level of confidence than the actual evidence supports. Additionally, legal counsel may escalate the language they use during their closing arguments, leaving the jury with a misleading impression of the evidence.

Beyond problems of how forensic testimony is communicated to the court, focus group members disclosed that some forensic experts have become apprehensive about even appearing in court. Clever cross-examinations and *ad hominem* attacks by attorneys were reported to have left experts embarrassed and humiliated on the stand. As a result, some of the best forensic experts may ultimately choose not to participate in the process for fear of such ridicule.

Focus group members also suggested that, due to the difficulty of parsimoniously explaining complex material to a lay audience, forensic scientists—who may already be

uncomfortable with public speaking—may benefit from training in how to effectively communicate in court. The difficulties associated with understanding and interpreting evidence could be minimized by providing courthouse actors with more opportunities to learn about forensic science than just the expert testimony itself.

Education and Training

The forensic sciences can be very complicated, and it is vitally important for judges, juries, and attorneys to understand the science to be able to perform their functions responsibly. Some of the focus group members suggested that the training of attorneys at law schools might put more emphasis on how to use and interpret scientific evidence.

The group agreed that judges are often placed in the difficult situation of needing to understand often very complicated material in fields where they may have no expertise. To overcome this, some judges prepare themselves before a trial the way anyone might go about learning a new topic. Members of the focus group pointed out that such independent study can lead to misinformation or misunderstanding. Judges may also try to consult expert advisors, but ultimately the issue remains whether the judges and juries comprehend the material presented by the attorneys in the case.

Group members proposed several options that could assist judges in preparing for cases involving forensic evidence. Judges can read other similar cases and relevant law review articles, obtain training from the Federal Judicial Center and the National Center for State Courts, consult reputable scientific organizations such as the American Association for the Advancement of Science, and talk to judges who have handled similar cases. In addition, judges can require some education (in the courtroom) from lawyers. Sometimes, the attorneys do not know enough about the science themselves; in such cases, judges should not make substantive decisions until they feel they understand the relevant information well enough. Even the most complicated subjects often can be explained in simple and understandable terms that the judge and jury can comprehend through the use of analogy or other methods, such as amicus briefs.

Focus group members noted that, in attempting to educate themselves, some judges, or their clerks, have been known to obtain information from the World Wide Web or other sources, but they had no way of knowing whether the information was accurate or balanced, or completely wrong. Over time, judges may want to hire clerks with technical knowledge; however, this can raise the issue of whether the clerk has an undue influence on the judge. Ultimately, the focus group members agreed that judges have to decide the extent to which they need to inform the attorneys about research they or their clerks conduct, and to what extent they confer with other judges in such cases.

Another possible source of information for judges that was suggested by the group members is to contact scientific societies, such as the American Association for the Advancement of Science (AAAS), for more information on specific forensic science topics. Relevant topics might include the following:

- Highlights of each forensic science's methodologies, forms of validity and reliability testing, and conformance with *Daubert* principles.
- Highlights of relevant social science topics, such as how a child victim of abuse might behave.

- What issues to ask about and consider in evaluating specific forensic evidence in the courtroom.
- Claims made by proponents and opponents of various forensic methods.

Group members cautioned that judges should also remain aware that these scientific societies may represent only the views of the scientists and may not necessarily present opposing views outside their fields of expertise, especially concerning possible weaknesses in methodology or reliability.

One member noted that the National Clearinghouse on Science, Technology, and the Law maintains an extensive database of vetted and impartial experts who can provide specialized assistance to judges. In some courts or types of cases, judges can obligate the parties to pay for court-appointed experts.

As with judges, juries can often find it challenging to understand, interpret, and apply forensic evidence. However, focus group members suggested that the problem may be with the trial procedures, not with the jurors. Perhaps the traditional model of the trial, in which jurors remain passive, does a poor job of informing jurors. Classroom instructional techniques might help jurors while preserving due process. New courtroom practices, such as allowing experts to debate or question one another, or experts presenting testimony in the same time frame rather than days apart, may more effectively inform juries and counteract arguments for fewer jury trials on the grounds that juries are not competent to do their job.

In sum, the focus group recognized that the forensic sciences can be difficult for judges and juries to understand, and similarly difficult for attorneys and defendants. The group also acknowledged that difficulty in understanding the forensic sciences and the general lack of accurate information about their interpretation may be affecting the justice system in ways that may not have been previously considered.

Pretrial and Plea Bargaining

Focus group members related that only a very small percentage of criminal cases actually proceed to trial. They asserted that most cases are disposed of through the plea bargaining process; however, this does not mean that these cases were not affected by the impact of forensic science evidence. On the contrary, members suggested that defendants and uninformed attorneys may too easily consider forensic evidence credible, or expect the jury to do so, and decide to enter into a plea agreement because of what may be potentially questionable forensic evidence. Group members proffered that sometimes plea agreements are reached early in court cases before the evidence has a chance to be challenged.

Noting that, in contrast to trials, the process of negotiating plea agreements takes place largely outside of the public record and scrutiny, group members expressed concern that this might present the opportunity for unchallenged and misunderstood forensic evidence to have an even greater effect than it might at trial. It is also possible that potentially questionable science is accepted as fact. Pretrial *Daubert* challenges may come from better trained defense counsel; however, in many cases there may be no challenge at all when, potentially, it could succeed.

The unobserved and unforeseen effects of the forensic sciences on courtroom outcomes can be problematic for more than just plea negotiations. The focus group discussed other forms and stages of processing, such as charging decisions and alternative dispute resolution, that may also occur outside of the court's public record. Even though the decisions involved in these processes take place outside of the courtroom, focus group members suggested that such decisions may be largely based upon the actors' expectations of what would occur in court. As such, if these actors misunderstand the forensic evidence, their expectations are likely to be inaccurate, potentially affecting their plea decisions.

Civil versus Criminal Cases

The focus group spent considerable time drawing distinctions between the presentation of scientific evidence in civil court versus criminal court. It was suggested that, as judges have discretion to make the often subjective determinations that result in the admission or exclusion of forensic evidence, they may also have a general tendency to favor the evidence of one side over the other. A lively discussion ensued, resulting in general agreement that judges may be applying *Daubert* differently in criminal versus civil cases. Some scholars suggest that scientific or forensic evidence is more likely to be admitted in favor of the government in criminal cases, and excluded when offered by plaintiffs in civil cases.[6] Accordingly, group members indicated that defense attorneys usually consider the probability of various forms of forensic evidence being admitted in the process of determining whether to accept plea bargains. In civil cases, one view holds that the *Frye* and *Daubert* standards tend to favor corporate defendants when a plaintiff sues with a novel theory about how he or she was harmed.

Questions to be considered, such as those posed by the use of forensic evidence in plea bargaining and in civil versus criminal cases, were a useful outcome of the focus group's discussion. Other questions and suggestions for research were also raised during the focus group's meeting. In the next section, many of the suggestions offered by the group are listed.

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[6] Faigman, D.L., Kaye, D.H., Saks, M.J., and Sanders, J. *Modern Scientific Evidence: The Law and Science of Expert Testimony (2006–2007 ed.).* Eagan, MN: Thomson West, 2006.

Moreno, J.A. "What Happens When Dirty Harry Becomes an (Expert) Witness for the Prosecution?" *Tulane Law Review 79* (2004) (1).

Risinger, D. Michael. "Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?" *Albany Law Review* 64 (2000): 99–152.

Next Steps

This section presents bulleted lists of the specific research suggestions and questions brought up during the focus group's discussion. These points are intended to provide direction to those interested in the role of scientific and forensic evidence in the courtroom as well as serving as a guide for the development of potential future research agendas. The following section represents the views of the focus group members, not the U.S. Department of Justice.

Suggestions Concerning the Science

- Determine how the "soft" forensic sciences can be more validated scientifically.
- Study the methodologies of forensic science, including human error components and instrumentation, and inherent limitations of the various techniques used. Specifically, consideration needs to be given to:
    - Using control groups.
    - Ranking different methods on the basis of their *validity* (scientific error).
    - Ranking different methods on the basis of their *reliability* (human error).
- Conduct objective studies of forensic science to determine the validity and reliability of different methods (e.g., in the areas of DNA, serology, hair analysis, voice- and fingerprints, and tool and bite marks).
- Study ways of reducing scientific and human error in the forensic evidence field.
- Develop descriptions of the most effective evaluation procedures of forensic science (e.g., a double-blind test involving multiple fingerprint examiners):
    - Learn what new techniques are being tested in the field.

Suggestions Concerning the Forensic Experts

- Examine ways to foster communication between related fields of science:
    - A clearinghouse could study and promote the cross-fertilization of the sciences by sharing key findings.
- Examine means by which the scientific community can communicate with the legal community.[7]
- Develop better means of conveying statistical information to juries.

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[7] For instance, the American Association for the Advancement of Science already has a joint standing committee with the Science and Technology Law Section of the American Bar Association called the National Conference of Lawyers and Scientists.

- Develop minimum standards for the quality of forensic evidence, such as the number of points of comparison for a good fingerprint match.
- Conduct single and double-blind studies to learn whether the presence or absence of other related case evidence, such as incriminating information, affects conclusions reached by forensic examiners.
- Study whether police laboratories and other laboratories reach different findings on the same evidence.
- Consider the potential benefits of an impartial, self-regulated forensics association (e.g., a role similar to that the American Bar Association plays in the legal arena), which sets standards and provides accreditation.
- Work with the American Society of Crime Laboratory Directors (ASCLD) to create Web-based training on ethics for forensic scientists:
    - Explore the possibility of ASCLD making the training a requirement for accreditation.

Suggestions Concerning the Courtroom

- Study any asymmetry in the application of the *Daubert* standard:
    - Criminal versus civil cases.
    - Government versus the defense.
    - Plaintiff versus the defense:
        - If there is a difference, is it an issue of fairness or of pushing the scientific envelope?
        - See the Moreno article in appendix IV.
- Examine how *Daubert*-related admissibility works in a world where science continues to advance:
    - What should be done if, for instance, a case is tried one year but considered on appeal several years later, when the science has changed?
    - How do attorneys, experts, and judges find out what other research is being conducted that might affect the outcome of the case?
    - How can they learn whether researchers in other fields are reaching different conclusions?
- Study whether a “Science Court” could help the justice system resolve scientific controversies before the science is introduced in specific cases.
- Evaluate possible ways of ensuring that law students are taught how to evaluate forensic science.

- Conduct research on what judges and jurors comprehend and what a control group (e.g., independent experts) understands in terms of scientific and forensic evidence:
    - Compare the parties' perceptions of the evidence presented and whether they are confused by the science, the experts' presentations, and so on.
- Study the role of forensic evidence in plea negotiations.

Judges

- Survey judges (perhaps at judicial conferences) on criteria they use when deciding whether to admit various forms of scientific and forensic evidence.
- Determine whether judges can conduct reliable and effective research of their own on scientific and forensic evidence, especially when making case-related decisions.
- Recommend reliable online resources that judges can consult to learn about scientific topics and controversies that exist around them.
- Evaluate or develop procedures (such as establishing clearinghouses) designed to help judges locate forensic science experts.
- Through demonstration projects, evaluate the effectiveness of having in-house experts onsite versus calling outside experts as the need arises.
- Consider the usefulness of setting up a "Science Advisor" position for judges to consult in a large court system.
- Study judges' use of impartial (court-appointed) experts in cases where scientific disputes arise.
- Update the online training, "Principles of Forensic DNA for Officers of the Court" (available at www.DNA.gov) so it includes all forensic evidence.
- Consider regional training workshops for officers of the court, using the updated training and trainers.
- Conduct a survey to find out the most useful format or medium for the training of judges, especially in the area of scientific and forensic evidence, including:
    - Web sites.
    - Tutorials (e.g., by the Federal Judicial Center).
    - DVDs.
    - Clearinghouses (e.g., American Association for the Advancement of Science; National Clearinghouse on Science, Technology, and the Law).
    - Updates of the applicable laws.
    - Journal articles.

  - Books.
  - A Federal judicial television network.

- Develop a guide to help judges obtain an accurate portrayal of the forensic and scientific evidence. This guide would provide the following:
  - Present steps that courts and experts can take to ensure that the degree of certainty of the forensic evidence is not exaggerated.
  - Identify areas of forensic science, in an objective, nonpartisan manner, where the science is conclusive and where it is still debatable:
    - Explain forensic techniques and methodologies.
    - State their validity and reliability.
    - Apply the *Daubert* standard to them.
  - Provide judges with accurate definitions and a working understanding of scientific terms, such as validity, reliability, and scientific theory.
  - Present advice for dealing with scientific experts:
    - Questioning an expert witness.
    - Understanding how the sequence of experts' testimony can make a difference.
    - Reminding judges of Rule 611, in which judges are encouraged to query experts during presentation of forensic evidence.
  - Discuss how best to deliver *Daubert*-related jury instructions:
    - Consider what juries already know when they come to court (dealing with the *CSI* effect).
    - Consider what juries need to know.
    - Consider what would be helpful for juries to know.

Juries

- Conduct a study to determine what types of arguments and evidence juries find persuasive in *Daubert*-related proceedings.
- Learn what types of scientific and forensic evidence juries tend to give too little or too much weight.
- Evaluate ways that juries can be helped to understand the correct weight to attach to a given piece of evidence:
  - A 1987 study by Charles Ellesley examined what jurors would have liked to know from experts in fingerprint-dependent cases (FBI publication).

  - If some forms of science are not considered very important by jurors, this might alter the amount or types of evidence introduced or help to determine the types of evidence jurors need to understand better.
  - Judges sometimes exclude evidence on the grounds that it would not be helpful to the jury, but they may not be correct in that assumption.

- Create a juror's pamphlet on forensic evidence that would accomplish the following:
  - Describe and explain the different types of forensic evidence.
  - Explain experts' terms, such as match, similar, and theory.
  - Teach the basics of understanding a statistical presentation.
- Develop and study the use and effectiveness of various resources designed to aid juror comprehension in forensic science cases, including:
  - Notebooks with preprinted information and room for notes.
  - Q&A sessions for jurors regarding the science.
  - Sequencing of experts.
  - Allowing experts to debate each other.

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Appendix II – Meeting Agenda

Scientific & Forensic Evidence in the Courts

National Institute of Justice

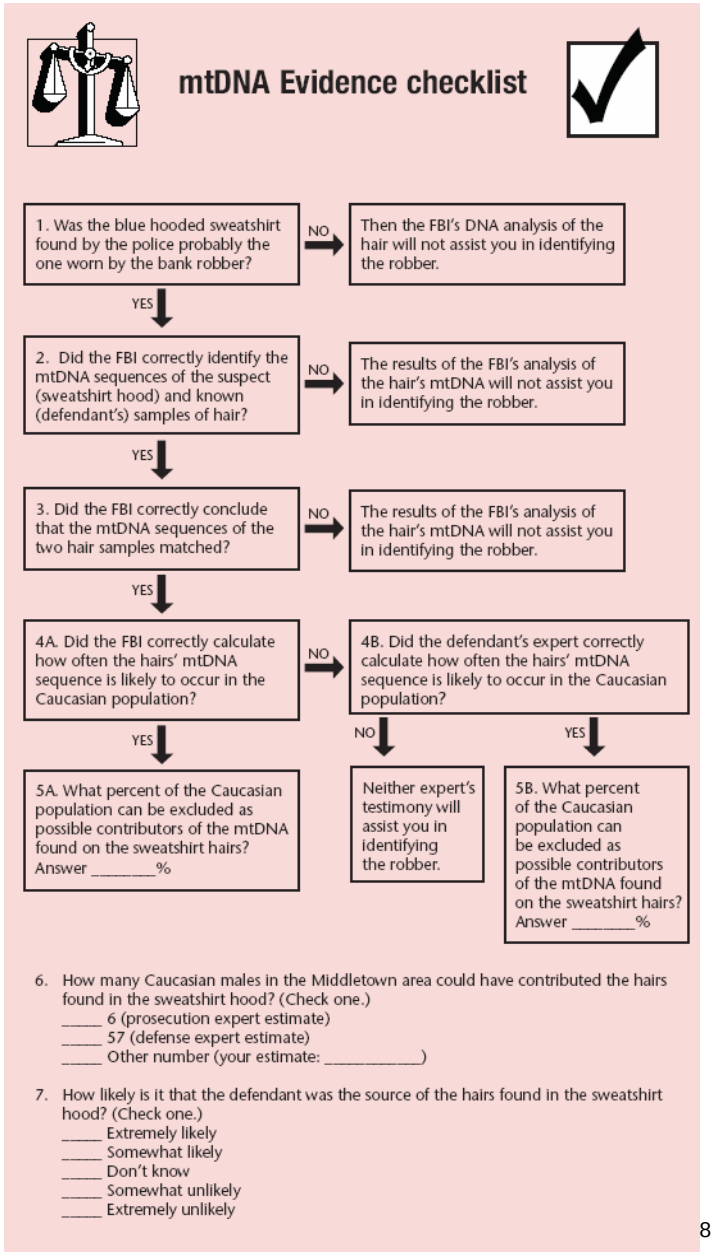
Focus Group
Monday, June 25, 2007
8:30 a.m.–5:00 p.m.

NIJ Pickett Conference Room

8:00 a.m.– 8:30 a.m.	**Registration and Coffee**
8:30 a.m.– 9:00 a.m.	**Welcome and Opening** **Introductions and Agenda Overview** **Cheryl Crawford Watson** Senior Advisor, Office of the Director, NIJ **Ed Connors** President, Institute for Law and Justice (Facilitator)
9:00 a.m.–10:00 a.m.	Brief overview of the history and current state of the laws and procedures pertaining to the use of scientific and forensic evidence in court cases **(Volunteer needed to start the discussion.)**
10:00 a.m.–11:00 a.m.	Brainstorm and listing of issues related to the use of scientific and forensic evidence in court cases.
11:00 a.m.–11:15 a.m.	**B R E A K**
11:15 a.m. – 12:30 p.m.	How judges prepare for cases involving complex scientific and forensic evidence —what is current practice?
12:30 p.m.– 1:00 p.m.	**W O R K I N G L U N C H**
1:00 p.m.– 3:00 p.m.	Discussion of needs related to (a) future training for judges in use of scientific and forensic evidence in court cases—what the substance should be and how it can best be delivered, (b) juror competence, and (c) future research on scientific and forensic evidence in court cases.
3:00 p.m.– 3:15 p.m.	**B R E A K**
3:15 p.m.– 4:30 p.m.	Recommendations for next steps for NIJ and the field
4:30 p.m.– 5:00 p.m.	Wrap-up
5:00 p.m.	Adjourn

Appendix III – Decision Tree

This decision tree is an example of an innovative jury tool that was used to clarify the jury's decision making process. Prior to trial, the judge and attorney's for both sides reached an agreement about the specific points of contention in the case. The result was this very formulaic, and simple, aid for the jurors to navigate the details of the case.



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[8] Dann, Michael, Hans, Valerie P., Kaye, and David H. "Can Jury Trial Innovations Improve Juror Understandng of DNA Evidence?" *Judicature* 90 (2007) (4): 152–156.

Appendix IV – Innovative Trial Practices

Several innovative measures for aiding juror comprehension are currently in use or being tried on a limited basis:

- Juror note-taking
- Juror multipurpose notebooks
- Pre-instructions in writing
- Juror questions for witnesses
- Juror discussions of evidence during breaks in trial
- Interim commentaries by attorneys
- Copies of written instructions for jurors
- Instructions before closing arguments
- Plain English jury instructions
- Suggestions for deliberations
- Re-opening and re-closing upon impasse
- Pretrial tutorials
- Court-appointed experts
- Sequencing or grouping of experts ((putting opposing experts back to back instead of separated by days)
- Expert assistance to counsel
- Inference charts or decision trees (see appendix) if balanced and the attorneys agree
- Deposition summaries
- Management and indexing of exhibits
- Juror requests for subjects to be addressed in closing arguments
- Complete responses to jurors' questions and requests during deliberations
- Directing opposing counsel to argue directly with each other so the plusses and minuses of a forensic technique can be fleshed out

Appendix V – Background Materials

Cabrera v. Cordis Corp. D.Nev., 1996. United States District Court. No. CV-S-94-720-PMP(RJJ).

Faigman, D. L., Kaye, D. H., Saks, M. J., & Sanders, J. (2006). *Modern scientific evidence : The law and science of expert testimony (2006–2007 ed.).* Eagan, MN: Thomson West, 2006.

Kaye, D. H., Hans, V. P., Dann, B. M., Farley, E., & Albertson, S. (2006). "Statistics in the jury box: How jurors respond to mitochondrial DNA probabilities," paper accepted for First Annual Conference on Empirical Legal Studies. Available: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=996134 [2007, July 20]. **Abstract:** This article describes parts of an unusually realistic experiment on the comprehension of expert testimony on mitochondrial DNA (mtDNA) sequencing in a criminal trial for robbery. Specifically, we examine how jurors who responded to summonses for jury duty evaluated portions of videotaped testimony involving probabilities and statistics. Although some jurors showed susceptibility to classic fallacies in interpreting conditional probabilities, the jurors as a whole were not overwhelmed by a 99.98% exclusion probability that the prosecution presented. C ognitive errors favoring the defense were more prevalent than ones favoring the prosecution. These findings lend scant support to the legal argument that mtDNA evidence (with modest exclusion probabilities) should be excluded because jurors are prone to overvalue such evidence. The article also introduces a new method for inferring the perceived probability of guilt that satisfies the burden of persuasion for most jurors.

Moreno, J. A. (2004). "What Happens When Dirty Harry Becomes an (Expert) Witness for the Prosecution?" 79 Tul. L. Rev. 1 (2004). **Abstract:** Judges routinely admit expert testimony offered by prosecutors, but frequently exclude expert testimony offered by the defense. A review of federal criminal court cases reveals that 92% of prosecution experts survive defense challenges, while only 33% of defense experts survive challenges by federal prosecutors. A study of federal criminal cases that resulted in an appeal found that more than 95% of prosecutors' experts had been admitted at trial, while fewer than 8% of defense experts were allowed to testify. Why do judges consistently fail to scrutinize prosecution experts? Maybe it's the uniform. The most common prosecution expert witness is a police officer or a federal agent. Prosecutors rely on police officer experts most frequently in narcotics cases. In drug cases, law enforcement experts are often asked to interpret ambiguous words or phrases used by the defendant and/or his coconspirators. The purpose of, and problem with, the expert testimony is that it tells jurors precisely which inculpatory inferences they should draw from the factual evidence. Defense attorneys who advocate for a more critical judicial analysis—arguing that jurors can understand drug-related words without assistance, that jurors should be permitted to draw their own inferences, or that any arguable relevance is "substantially outweighed by the danger of unfair prejudice" to the defendant—invariably fail. Why should we be concerned that police officer experts often play a crucial role in obtaining convictions? At a minimum, this fact demonstrates that the Daubert revolution, aimed at upgrading the quality of expert evidence, has had surprisingly little impact in the criminal courts. When experts make inferences and draw conclusions that rely on factual evidence derived from their own investigations,

problems abound. The dual role of fact and expert witness contains a built-in incentive for the witness to shape the facts to fit the opinion or the opinion to fit the facts. Judicial qualification of a police officer as an expert can also imbue all of her testimony, including her fact testimony, with an aura of neutrality or expertise that can artificially enhance credibility. There is no quick fix that will stem the tide of judicial permissiveness, but this Article discusses several sources of hope.

Munsterman, G. T., Hannaford-Agor, P. L., & Whitehead, G. M. (2006). *Jury trial innovations.* Williamsburg, VA: National Center for State Courts.

Ninth Circuit Jury Trial Improvement Committee. (2004). First report on goals and recommendations. Prepared for the Judicial Council of the Ninth Circuit.

Ninth Circuit Jury Trial Improvement Committee. (2006). Second interim report: Recommendations and suggested best practices. Prepared for the Judicial Council of the Ninth Circuit.

Risinger, D. Michael (2000). "Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?" 64 Albany Law Review, pp. 99-152.

"The Feasibility of External Blind DNA Proficiency Testing, II: Experience with Actual Testing," Joseph Peterson, Robert Gaensslen, George Lin, Monica Ho, and Ying-Yu Chen. Journal of Forensic Sciences Vol. 48, No. 1, 32-40, 2003.

"The General Assumptions and Rational for Forensic Identification," Chapter 31, Joseph Peterson and John Thornton, in Modern Scientific Evidence: The Law and Science of Expert Testimony. David L. Faigman, David H. Kaye, Michael J. Saks, and Joseph Sanders, eds., West Group, 2002, revised 2007.

"Crime Laboratory Proficiency Testing Results, 1978-1991, I and II: Joseph Peterson and Penny Markham. Journal of Forensic Sciences, Vol. 40, No. 6, pp. 994-1029, 1995.

"The Uses and Effects of Forensic Science in the Adjudication of Felony Cases," Joseph Peterson, John Ryan, Pauline Houlden and Steven Mihajlovic. Journal of Forensic Sciences, Vol. 32, No. 6, (November 1987), 1730-1753.