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INTRODUCTION

Expert evidence is a familiar but challenging feature in the modern trial.[1] Judges must decide on the admissibility of expert testimony,[2] and jurors must grapple with the testimony if it is admitted. If courts are uneasy about the ability of the jury to handle the expert evidence, they may be inclined to play a more active role as gatekeeper in monitoring what the jury will be permitted to consider. Critics of the jury often assume that lay jurors are incapable of understanding and assessing the claims of

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[1] *See* Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1114 (1991).

[2] Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993); *see also* FED. R. EVID. 702–703; Kumho Tire Co. Ltd. v. Carmichael, 526 U.S. 137 (1999); Gen. Elec. Co. v. Joiner, 522 U.S. 136 (1997).

experts who present technical, scientific, or pseudo-scientific testimony.[3] What may happen if jurors indeed cannot competently evaluate expert testimony? One possibility is that they will ignore crucial evidence. An alternative possibility is that the jurors will be naively uncritical of expert testimony, overawed by an expert with imposing credentials, impressed by jargon they do not understand, and misled by "its aura of special reliability and trustworthiness."[4] Neither of these threats comports with the picture of jury reactions to experts that emerges from empirical research on jury behavior.[5]

That is not to say that juries always understand expert evidence. No layperson, juror, or judge faced with complex technical or scientific evidence can be expected to master all of this challenging material, so it is not surprising to find occasions on which the trier of fact reaches a decision that appears to be inconsistent with the weight of the evidence. Indeed, one of the advantages of appellate review is that it can provide some check on these errors. But before drawing any conclusions about deficiencies in how jurors deal with expert testimony, a more systematic analysis of the evidence is required. I begin with an overall picture of jury decision-making drawn from a variety of empirical studies. I then turn specifically to research addressing how jurors respond to expert testimony. Finally, I consider the particular challenges posed by experts and what judges can do to optimize how jurors deal with expert testimony.

Throughout this analysis, I draw on several different approaches to the empirical study of jury behavior. Together these different ways of studying the jury provide a more grounded and comprehensive picture of juries than would be obtainable from one method—or from the selective newspaper coverage of unusual trials.[6] The methods include archival studies of jury verdicts;[7] post-

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[3] *See, e.g.,* PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM (1991).

[4] United States v. Amaral, 488 F.2d 1148, 1152 (9th Cir. 1973).

[5] Neil Vidmar & Shari Seidman Diamond, *Juries and Expert Evidence,* 66 BROOK. L. REV. 1121, 1149–67 (2001).

[6] Shari Seidman Diamond, *Truth, Justice, and the Jury*, 26 HARV. J. OF LAW & PUB. POL'Y 143 (2003); Michael McCann et al., *Java Jive: Genealogy of a Juridical Icon*, 56 U. MIAMI L. REV. 113, 142 (2001); Laura Beth Nielsen

trial surveys of jurors;[8] surveys of jury observers, such as judges and attorneys;[9] simulations;[10] and a unique study, the Arizona Jury Project, in which we were able to videotape and analyze actual civil jury deliberations.[11]

Each of these sources has strengths and weaknesses. Archival studies can collect information on large samples of cases but depend on the information that courts or jury verdict reporters have collected. As a result, a significant amount of relevant information is often missing. Post-trial surveys and interviews with jurors enable researchers to reconstruct juror understandings and deliberations with input from the jurors themselves, but even cooperative jurors may provide incomplete and misleading impressions. Jurors who are questioned after trial know how the trial came out and have publicly endorsed the verdict. The outcome can have a powerful impact on the jurors, leading them in

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& Aaron Beim, *Media Misrepresentation: Title VII, Print Media, and Public Perceptions of Discrimination Litigation*, 15 STAN. L. & POL'Y REV. 237 (2004); Daniel S. Bailis & Robert J. MacCoun, *Estimating Liability Risks with the Media as Your Guide: A Content Analysis of Media Coverage of Tort Litigation*, 20 LAW & HUM. BEHAV. 419 (1996).

[7] Gross, *supra* note 1.

[8] Sanja Kutnjak Ivkovic & Valerie P. Hans, *Jurors' Evaluations of Expert Testimony: Judging the Messenger and the Message*, 28 LAW & SOC. INQUIRY 441, 450–452 (2003); Daniel W. Shuman & Anthony Champagne, *Removing the People from the Legal Process: The Rhetoric and Research on Judicial Selection and Juries,* 3 PSYCH. PUB. POL. & L. 242, 253–56 (1997).

[9] HARRY KALVEN, JR., & HANS ZEISEL, THE AMERICAN JURY (1966); Larry Heuer & Steven Penrod, *Trial Complexity: A Field Investigation of Its Meaning and Its Effects*, 18 LAW & HUM. BEHAV. 29 (1994); Theodore Eisenberg et al., *Judge-Jury Agreement in Criminal Cases: A Partial Replication of Kalven and Zeisel's The American Jury*, 2 J. EMPIRICAL. LEGAL STUDIES 171 (2005).

[10] Margaret B. Kovera et al., *Reasoning About Scientific Evidence: Effects of Juror Gender and Evidence Quality on Juror Decisions in a Hostile Work Environment Case*, 84 J. APP. PSYCHOL. 362 (1999); Brian L. Cutler et al., *Expert Testimony and Jury Decision Making: An Empirical Analysis*, 7 BEHAV. SCI. & L. 215 (1989).

[11] Shari Seidman Diamond, Neil Vidmar, Mary R. Rose, Leslie Ellis, & Beth Murphy, *Juror Discussions During Civil Trials: Studying an Arizona Innovation*, 45 ARIZ. L. REV. 1 (2003) [hereinafter *Juror Discussions During Civil Trials*].

retrospect to view the ultimate verdict as inevitable and affecting their recall of the process that produced the jury's decision.[12]

In jury simulations—the method most frequently used to study jury behavior—it is possible to systematically test the impact of variations in evidence or procedure on jurors, thereby providing strong causal evidence on how these variations affect behavior. Mock jurors participating in simulations, however, even those simulations using members of the jury venire and presenting full-length videotaped trials, know that they are in a simulation. In addition, both the trials and the jury deliberations in simulations are predictably short in duration.[13] The extent to which these characteristics affect the behavior of mock jurors is likely to vary, depending on the nature of the case and the behavior being measured.

Finally, one study of deliberating juries deciding actual cases provides for the first time a direct window into real jury deliberations, even though it too has a potential weakness: although the jurors were assured that, under court order, no one other than the researchers would ever view the deliberations, and the cameras were unobtrusively positioned in the ceilings, the jurors knew that their deliberations were being videotaped.[14] While each of these methods thus has both strengths and weaknesses, the weaknesses vary across methods. Together, this large body of research shows a consistent pattern of results, both in describing jury behavior overall and in revealing how jurors react to experts.[15]

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[12] *See* Baruch Fischhoff, *Hindsight ≠ Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPERIMENTAL PSYCH. 288, 288 (1975).

[13] For a discussion of the value and limitations of jury simulations, *see* Shari Seidman Diamond, *Illuminations and Shadows From Jury Simulations*, 21 LAW & HUM. BEHAV. 561, 562 (1997).

[14] For a detailed description of the taping and consent procedures, *see Juror Discussions During Civil Trials*, *supra* note 11, at 23.

[15] *See* Vidmar & Diamond, *supra* note 5, at 1174.

I. THE JURY'S APPROACH TO THE TRIAL

A jury is not a blank slate that merely absorbs trial evidence and instructions on the law before applying the law to the evidence in order to arrive at a verdict. Indeed, courts recognize that something more is afoot when they tell jurors to consider all of the evidence in the light of reason, common sense, and experience. Jurors consider all of the evidence in this manner—as they must—when arriving at their decisions. All human decisionmakers (judges as well as jurors) find it necessary to draw on their prior experiences to make sense of what they see and hear. Those prior beliefs and expectations unavoidably filter and organize perceptions,[16] often assisting and occasionally impairing reasonable inferences about the evidence. For example, a juror in one of the cases in the Arizona Jury Project submitted a question during trial asking whether the fact that a young man had been drinking prior to being injured in a serious accident was likely to have affected the severity of his injury.[17] This juror was implicitly drawing on his beliefs about the effects of alcohol, and perhaps his prior experiences with drinking.[18] The ubiquitous impact of prior experience on judgment was reflected in an insightful observation from United States Supreme Court Justice John Paul Stevens in a recent interview.[19] Justice Stevens said that he was sure that his views on the Supreme Court had been influenced by the "totally unjust conviction" of his father for embezzlement.[20]

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[16] Charles G. Lord, Lee Ross, & Mark R. Lepper. *Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence*, 37 J. PERS. & SOC. PSYCH. 2098 (1979).

[17] The Project is described in *Juror Discussions During Civil Trials, supra* note 11, and discussed further *infra* text accompanying notes 28–33.

[18] In Arizona, where jurors are permitted to submit questions for witnesses during trial, a juror posed this question for the defense expert. The expert responded that the plaintiff's drinking would have had no effect. It was a particularly credible response because a different answer might have assisted the defense. The issue was never mentioned during deliberations.

[19] Jeffrey Rosen, *The Dissenter*, N.Y. TIMES MAGAZINE, Sept. 23, 2007, at 50, 54.

[20] *Id.*

Research on jurors indicates that they typically are strongly motivated to reach a correct verdict, and that they actively process what they see and hear in the courtroom to arrive at that decision.[21] Jurors apply commonsense norms of behavior to evaluate the reasonableness of behavior and to sort out competing claims.[22] They are also aware that they are in an adversary setting, that all of the witnesses and attorneys are attempting to persuade them, and that it will be up to the jurors to decide which of the conflicting accounts is convincing. As a result, jurors are alert to signs that witnesses are dissembling, and they "cross-check" claims, seeking consistency across sources.[23] Jurors are particularly interested in evidence that appears to be less subject to manipulation and more reliable than the claims of an interested party or other witness. As the jurors watch the trial unfold, they also realize that at the trial's conclusion they will have to reach a group decision which may involve convincing fellow jurors who have different reactions to the evidence. Although individuals tend to expect others to see the world the way they see it,[24] the anticipation of having to defend one's views and persuade others tends to promote active

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[21] *See generally* W. LANCE BENNETT & MARTHA S. FELDMAN, RECONSTRUCTING REALITY IN THE COURTROOM (1981); Nancy Pennington & Reid Hastie, *A Cognitive Theory of Juror Decision Making: The Story Model*, 13 CARDOZO L. REV. 519 (1991); Nancy Pennington & Reid Hastie, *Explaining the Evidence: Tests of the Story Model for Juror Decision Making*, 62 J. PERSONALITY & SOC. PSYCHOL. 189 (1992); Shari Seidman Diamond & Jonathan D. Casper, *Blindfolding the Jury to Verdict Consequences: Damages, Experts, and the Civil Jury*, 26 LAW & SOC'Y REV. 513 (1992).

[22] NORMAN FINKEL, COMMONSENSE JUSTICE: JUROR'S NOTIONS OF THE LAW (1995); *see also* Jason Schklar & Shari Seidman Diamond, *Juror Reactions to DNA Evidence: Errors and Expectancies*, 23 LAW & HUM. BEHAV. 159, 180–81 (1999).

[23] Shari Seidman Diamond, Mary R. Rose, Beth Murphy & Sven Smith, *Juror Questions During Trial: A Window Into Juror Thinking,* 59 VANDERBILT L. REV. 1927, 1954–62 (2006) [hereinafter *Juror Questions During Trial*].

[24] Lee Ross, David Greene, & Pamela House, *The "False Consensus Effect": An Egocentric Bias in Social Perception and Attribution Processes*, 13 J. EXPER. SOC. PSYCHOL. 279 (1977); Joachim Krueger & Russell W. Clement, *The Truly False Consensus Effect: An Ineradicable and Egocentric Bias in Social Perception,* 67 J. PERS. SOC. PSYCH. 596 (1994).

engagement and processing.[25]

This engagement by jurors does not eliminate their need to struggle with some of the judgments they are asked to make and the tools (e.g., jury instructions) they are expected to use in reaching those judgments. Jury interactions during deliberations generally do not represent a linear decision-making process, yet by the end of deliberations, this group process generally results in a verdict that most jurors see as fairly reflecting the facts that led to the trial and comporting with the law as they understand it.

II. JUROR RESPONSE TO EXPERTS

Complex evidence presents a particular challenge for both the experts who must communicate with a lay audience and the audience members themselves—the triers of fact. Jurors recognize the value of expert evidence for assisting them in reaching their decisions, but surveys of jurors indicate that while jurors find expert testimony to be useful, they are also wary of experts. For example, in one survey of jurors, 30 percent said, "experts provided biased testimony."[26] Other studies have shown that jurors expect experts to be relatively competent and likely to be knowledgeable, but jurors also anticipate that the experts will be influenced by the side that called them to testify.[27] Thus, countervailing forces influence juror perceptions of expert testimony because the credibility of a communicator is influenced by the communicator's expertise and trustworthiness. The expectation of potential bias acts as a brake on the persuasiveness of an expert.[28]

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[25] Philip E. Tetlock, *Accountability: A Social Check on the Fundamental Attribution Error*, 48 SOC. PSYCHOL. Q. 227, 233 (1985).

[26] Daniel W. Shuman, Elizabeth Whitaker & Anthony Champagne, *An Empirical Examination of the Use of Expert Witnesses in the Courts—Part II: A Three City Study*, 34 JURIMETRICS J. 193, 203 (1994).

[27] Shari Seidman Diamond, *Beyond Fantasy and Nightmare: A Portrait of the Jury*, 54 BUFF. L. REV. 717, 746 (2006).

[28] *See* Shari Seidman Diamond & Jonathan D. Casper, *Blindfolding the Jury to Verdict Consequences: Damages, Experts, and the Civil Jury*, 26 LAW & SOC'Y REV. 513, 558 (1992).

The Arizona Jury Project, in which we observed actual jury deliberations, presented a unique opportunity to observe how juries handle expert testimony.[29] The opportunity to study these jury deliberations arose because an innovative group of judges and attorneys in Arizona, encouraged by the Arizona Supreme Court, took a close look at their jury system. As a result, Arizona decided to make some changes aimed at facilitating jury performance, including a controversial innovation instructing jurors that they were permitted to discuss the case among themselves during breaks in the trial. To evaluate the effect of allowing discussions, the Arizona Supreme Court issued an order permitting a team of researchers to conduct a randomized experiment in which some jurors in some cases were instructed that they could discuss the case and others were given the traditional admonition not to discuss the case.[30] The court order also permitted us to videotape the jury discussions and deliberations.[31]

The jurors, attorneys, and parties were promised that the tapes would be viewed only by the researchers and only for research purposes. Jurors were told about the videotaping project when they arrived at court for their jury service. If they preferred not to participate, they were assigned to cases not involved in the project.

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[29] *See Juror Discussions During Civil Trials*, *supra*, note 11. Other published articles drawing on data from the Arizona Project include: Shari Seidman Diamond & Neil Vidmar, *Jury Room Ruminations on Forbidden Topics*, 87 VA. L. REV. 1857 (2001); Shari Seidman Diamond, Neil Vidmar, Mary Rose, Leslie Ellis, & Beth Murphy, *Inside the Jury Room: Evaluating Juror Discussions During Trial*, 87 JUDICATURE 54 (2003); Diamond, *supra* note 6; Shari Seidman Diamond, Mary R. Rose, & Beth Murphy, *Jurors' Unanswered Questions*, 41 CT. REV. 20 (2004); Shari Seidman Diamond, Mary R. Rose & Beth Murphy, *Revising the Unanimity Requirement: The Behavior of the Non-Unanimous Civil Jury,* 100 NW. U. L. REV. 201 (2006); *Juror Questions During Trial*, *supra* note 23.

[30] *See Juror Discussions During Civil Trials*, *supra* note 11.

[31] *See id.* at 17, for a detailed report on the permissions and security measures the project required, and the results of the evaluation. As part of their obligations of confidentiality under the Supreme Court Order as well as additional assurances to parties and jurors undertaken by the principal investigators, the Authors of this Article have changed certain details to disguise individual cases. The changes do not, however, affect the substantive nature of the findings that are reported.

The juror participation rate was over 95 percent.[32] Attorneys and litigants were less willing to take part in the study. Some attorneys were generally willing to participate when they had a case before one of the participating judges; others consistently refused. The result was a 22 percent yield among otherwise eligible trials.

We also videotaped the trials themselves and collected the exhibits, juror questions submitted during trial, jury instructions, and verdict forms. In addition, the jurors, attorneys, and judge completed questionnaires at the end of the trial. The fifty cases in the study reflected the usual mix of cases dealt with by state courts: 26 motor vehicle cases (52 percent), four medical malpractice cases (8 percent), seventeen other tort cases (34 percent), and three contract cases (6 percent).[33] Awards ranged from $1,000 to $2.8 million, with a median award of $25,500.

In the prior analysis of the discussion innovation, we looked for indicators of how the opportunity for discussion affected jurors' response to expert testimony. The opportunity to discuss the case appeared to be particularly helpful in the more complex cases. When factual questions arose about the evidence, discussion tended to improve the accuracy of recall. Moreover, jurors permitted to discuss the case reported significantly greater ease in comprehension of the expert testimony.[34] Thus, the opportunity to discuss the case appeared to provide assistance precisely where advocates of the innovation expected it would be most valuable.

After completing our evaluation of the impact of the discussions innovation on the Arizona juries, we turned to analyses of the deliberations from this unique data set to answer other questions about the jury. Some of these analyses provide insights

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[32] Although we cannot be certain that the cameras had no effect on their behavior during deliberations, the behavior during deliberations at times included comments that the jurors presumably would not have wanted the judges or attorneys to hear.

[33] This distribution is similar to the breakdown for civil jury trials for the Pima Country Superior Court for the year 2001: 62 percent motor vehicle tort cases, 8 percent medical malpractice cases, 23 percent other tort cases and 6 percent contract cases (figures provided by Nicole M. Waters of the National Center for State Courts).

[34] *Juror Discussions During Civil Trials*, *supra* note 11, at 74–76.

into how jurors respond to expert testimony. Forty-three of the fifty cases had experts who gave live testimony, a median of three per case. Half of the cases (24 of the 50) had opposing experts who testified on the same issue. The 122 live expert witnesses included physicians, mental health professionals, biomechanical engineers, financial analysts, and academic scientists. The jurors in these cases had an opportunity to submit questions for these experts during trial. In Arizona, as in a small but growing number of jurisdictions, jurors are permitted to submit questions for witnesses during trial.[35] The 257 questions the jurors submitted for experts revealed what jurors were thinking about as they were being exposed to expert testimony,[36] and their deliberations provide some insights into juror reactions to the experts.

Research on cognitive processing distinguishes between two reactions to attempts at persuasion.[37] The first is peripheral or heuristic processing which occurs when decision makers are either unmotivated or unable to evaluate the arguments that a communicator is making. Under those circumstances, the decision maker is inclined to use a short cut—a heuristic—to decide whether or not to accept the claims being made. The prestige of the communicator, e.g., her occupation or education, provides a peripheral cue to the decision maker that, all other things being equal, he should accept the claims that the expert is making. If jurors were motivated to avoid the effort of evaluating expert evidence, or if they simply were unable to process the information

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[35] A few states, including Arizona, now require judges to tell jurors that they may submit questions during trial. Most leave the choice to judicial discretion, although a few explicitly forbid it. The 2005 ABA Principles for Juries and Jury Trials endorses the practice. AMERICAN BAR ASSOCIATION, PRINCIPLES FOR JURIES AND JURY TRIALS, PRINCIPLE 13(C).

[36] This section is based in part on *Juror Questions During Trial*, *supra* note 23, focusing on the 257 questions jurors submitted for experts out of the 829 total questions they submitted for all witnesses.

[37] ALICE H. EAGLY & SHELLY CHAIKEN, THE PSYCHOLOGY OF ATTITUDES 326–27 (1993); Shelly Chaiken, *The Heuristic Model of Persuasion*, *in* 5 SOCIAL INFLUENCE: THE ONTARIO SYMPOSIUM 3 (Mark P. Zanna et al. eds., 1987); RICHARD E. PETTY, COMMUNICATION AND PERSUASION: CENTRAL AND PERIPHERAL ROUTES TO ATTITUDE CHANGE 3 (John T. Cacioppo ed., 1986).

an expert was offering, they could simply defer and accept the conclusions without engaging in further processing. Jurors would be engaged in peripheral processing if they merely compared the credentials of two opposing experts and accepted the opinions of the more prestigious source.

A second form of processing, called central or systematic processing, occurs when a decision maker is motivated to understand and evaluate a persuasive communication, scrutinizing the quality of the arguments and not simply deferring to the claims of a prestigious source.[38] The questions jurors submitted to the experts reveal how jurors attempted to deal with expert testimony as it was being presented during trial.

The clearest evidence of peripheral processing would emerge if jurors failed to submit questions to the expert witnesses at all or if they asked only about credentials or experience. In fact, jurors submitted questions for almost half (47.5 percent) of the expert witnesses, averaging 2.11 questions per witness. Even though jurors are instructed that they should consider the qualifications and experience of expert witnesses in judging their credibility,[39] only fifteen (5.8 percent) of the 257 questions directed to the experts concerned credentials or experience. Instead, the nature of the questions generally reflected attempts by the jurors to get further information that could assist them in evaluating the content of the testimony. Many of the questions focused on alternative

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[38] Chaiken, *supra* note 37, at 3; *see generally* Ronald J. Allen & Joseph S. Miller, *The Common Law Theory of Experts: Deference or Education?*, 87 NW. U. L. REV. 1131 (1993).

[39] ARIZONA STATE BAR, REVISED ARIZONA JURY INSTRUCTIONS (CIVIL) 6, 7 (3d ed. 1997)

> A witness qualified as an expert by education or experience may state opinions on matters in that witness's field of expertise, and may also state reasons for those opinions. Expert opinion testimony should be judged just as any other testimony. You are not bound by it. You may accept it or reject it, in whole or in part, and you should give it as much weight as you think it deserves, considering the witness's qualifications and experience, the reasons given for the opinions, and all the other evidence in the case.

Id.

possible causes for the plaintiff's injury.

Although overall, issues of causation were the focus of 21.1 percent of the juror questions, they accounted for 34.6 percent of the questions for experts. For example, in a medical malpractice case a juror asked: "What were other potential causes for the . . . damage that you observed and why were they less plausible causes for [the plaintiff's injury] than the cause that you have ascertained?" Other questions simply sought clarification on what the witness had said. For example, in one case involving a claim of infliction of emotional distress, a juror asked the psychologist, "What does the term 'reasonable psychological probability' mean?" In some of the questions, jurors probed the basis for the expert's conclusions. In a motor vehicle case, a juror asked the engineer who testified about his description of what must have happened to the passenger at the time of impact, "Not knowing how he was sitting, or his weight, how can you be sure he hit his shoulder?" In a products liability case, the jurors questioned a scientist on his methods for testing and evaluating the product. And in several cases, experts testified about standards of reasonable care and jurors submitted questions asking whether specific governmental or industry regulations applied and, if so, what the codes or regulations said. In sum, the questions as a group reflect a picture consistent with central rather than peripheral processing. In some cases, the expert testimony did not turn out to be pertinent for the jurors in reaching their verdicts (e.g., when a physician testified about the extent of a plaintiff's injury and the jury concluded that the defendant had not been negligent), but in other cases the jurors discussed the content of the expert testimony extensively during deliberations.

Examples from the deliberations reveal some of the cues jurors used to evaluate the trustworthiness of the expert testimony.[40] Jurors were suspicious of experts who appeared to be obfuscating. As one juror complained, "He won't give you a straight answer." They also occasionally expressed concern that an expert's opinion was unrepresentative. For example, in a medical malpractice case in

[40] We will present a comprehensive analysis of the role played by expert testimony in these deliberations in a future article.

which opposing experts made opposing claims about the reasonable standard of care, a juror expressed concern about the difficulty of evaluating which was more accurate: "What I would like to have is 40 [specialists] and show them the [test results] and okay, get a survey and is this significant or is this not significant and would they have [done what the defendant did]?"

We asked the judges to indicate on their post-trial questionnaires the names of any witnesses who were "particularly important or crucial" on the issue of liability for the plaintiff's case and for the defendant's case. In five of the cases the judges named two expert witnesses in the same general field (e.g., medicine, engineering) who gave opposing testimony on the same liability issue. In these five cases, the evidence presented by the experts was clearly contested and, in the judge's opinion, central to the case. I examined the trial evidence and jury deliberations in these cases to get an overall picture of the extent to which the juries dealt with the testimony given by these experts, and how they attempted to resolve the differences between them. During their deliberations, the jurors discussed the testimony of all of these witnesses, although they did not discuss the testimony of each expert in detail in each case:

> *Case 1*: The principal dispute between the experts concerned the need for surgery to relieve pain following an accident. The medical issue was whether the surgery was actually done in response to a preexisting injury or degenerative condition. The defense claimed that the accident had not caused any injury, and that surgery was unwarranted. The jurors spent much of their time analyzing the circumstances of the accident in light of the testimony of lay witnesses who were on the scene, concluding that the accident had caused some injury. Nonetheless, the jurors were doubtful about the credibility of the plaintiff who appeared to give inconsistent testimony about his injuries. In discussing the competing medical testimony, the jurors consulted the MRI results as well as the expert testimony about the alleged injury. Several jurors expressed disapproval in response to the defense attorney's argument that the plaintiff's expert, a "doctor that teaches at a

university," was offering junk science and was not being reputable. Nonetheless, the jurors were persuaded that the plaintiff was exaggerating his pain, as the defense expert suggested. The jurors concluded that the plaintiff would have been better off "if [defense expert] had been his doctor from the beginning."

Case 2: In a medical malpractice case, the opposing experts disagreed on whether the defendant met the relevant standard of care, the diagnosis, and the causal impact of the defendant's behavior. Both experts were well-credentialed and experienced. The jurors viewed both of them as good teachers, although they found the defense expert somewhat longwinded. They were also impressed by the experts' credentials ("Have you seen the credentials on this doctor? Have you read his resume? It's the size of a small book.") But they viewed with some cynicism what they perceived as the attempt to impress them with it ("That's part of the reason why they gave that to us to read."). There were many other witnesses in the case, but the jurors spent the bulk of their time during deliberations discussing the content of the testimony from these opposing experts, comparing what they said on all three of the relevant contested issues they covered. The jurors in the end were persuaded that the outcome would probably have been different if the defendant had treated the patient according to what they were convinced was reasonable care.

Case 3: The plaintiffs in this case claimed they had suffered emotional trauma due to a serious injury the defendant had caused. The opposing experts offered testimony on the evidence for the emotional distress and its probable cause. The defense expert claimed that other conflict in the family and prior events could explain the emotional trauma allegedly experienced by one of the plaintiffs. The jurors spent little time discussing the expert testimony, although they discussed the likely causes of the plaintiff's emotional disturbance. Unlike the other expert testimony that appeared technical or scientific on its face, the jurors did not struggle to work through the meaning of the clinical

testimony on mental health. They appeared comfortable in drawing conclusions about the alleged trauma based on their own experience. The jurors were also inclined to discount the testimony of the plaintiff's expert who they viewed as arrogant. Although they also specifically rejected his analysis of the extent of the plaintiff's psychological injury as overblown and only partially agreed with his causal account of its source, they ultimately arrived at a modest damage award on this claim.

Case 4: The plaintiff hired the defendant to repair her furnace. The defendant repaired the furnace, but informed the plaintiff that she needed to replace it due to its age. The plaintiff adjusted some wiring next to the furnace after the defendant completed the repair. When the furnace caught fire a short time later, the plaintiff alleged that the defendant was responsible. The opposing experts testified on the likely cause of the fire, and much of the deliberation focused on that testimony, as the jurors struggled to make sense of the competing paths that might have led to the fire. Ultimately, the jurors were not convinced that the repairman had been careless or negligent, and they were unpersuaded that the plaintiff had shown that the causal mechanism the expert identified was the cause of the fire. Several jurors concluded that the weight of the evidence was evenly balanced, so the defendant should prevail.

Case 5: The opposing experts the judge identified as important in this automobile collision were both engineers who offered testimony on how the accident had occurred, including its physical impact on the plaintiff. Liability for minor injury to the plaintiff was not in dispute, but the point of impact and liability for the major injury the plaintiff claimed he had sustained, were hotly contested. The plaintiff's expert had more education (a Ph.D), while the defense expert had more experience as a consultant in accident reconstruction. The jurors explored this difference, but ultimately concluded that it was not significant and focused their attention on the content of the testimony. Much of their discussion of these experts occurred during

> breaks in the trial.[41] During the deliberations, the jury focused on both the medical testimony and the impact analyses. The jurors concluded that the defense medical expert was correct when he testified that all, or at least part, of the plaintiff's medical condition had been caused by a pre-existing injury, rather than by damage resulting from the collision. The jury also discussed how the plaintiff's failure to wear his seatbelt had contributed to the injury.

Many of the themes reflected in the jurors' questions for experts and in these deliberations mirror patterns we have observed in other research on juries: the jurors do not accept expert testimony on face value. They consider credentials and expertise, but are actively engaged with the content and attempt to assess the accuracy of what the experts say. Although the jurors vary in their understanding of the evidence, jurors who appear to have greater mastery of the evidence assist the others and tend to be most influential. Thus, juries draw on the expertise of their most competent member to assess the strength of the evidence.[42]

Nonetheless, although jurors typically work diligently and ordinarily succeed as a group in understanding the major elements of the expert testimony, they are sometimes confused by what experts say.[43] Jurors are instructed to base their verdicts on the evidence and legal instructions, but their ability to fully process the evidence may be reduced if the expert fails to teach as well as to attempt to persuade. Even when this occurs, jurors generally are not overwhelmed and misled by the complexity of expert evidence. Instead, they use reasonable strategies to evaluate it[44] When faced

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[41] The jury in this case was told that jury members were permitted to discuss the evidence during breaks.

[42] *See* Diamond & Casper, *supra* note 28.

[43] MOLLY SELVIN & LARRY PICUS, THE DEBATE OVER JURY PERFORMANCE 27–28 (1987). *See generally* Joseph Sanders, *Jury Deliberation in a Complex Case:* Havner v. Merrell Dow Pharms., 16 JUST. SYS. J. 45 (1993).

[44] *See* Richard O. Lempert, *Civil Juries and Complex Cases: Taking Stock After Twelve Years*, *in* VERDICT: ASSESSING THE CIVIL JURY SYSTEM 181 (Robert E. Litan ed., 1993); Irwin Horowitz & Kenneth S. Bordens, *An Experimental Investigation of Procedural Issues in Complex Tort Trials*, 14

with technical testimony, jurors look for cues about the trustworthiness of the source, sometimes using the language itself as a cue. They do use credentials and experience as cues, but not in the absence of an evaluation of the message itself. That is, there is little evidence to suggest that jurors adopt the position of an expert based solely on peripheral cues.[45] What is more likely to happen is that the juror will reject unintelligible expert testimony—a pattern that should create an incentive for experts (and for the attorneys who hire them) to maximize the clarity of the expert's presentation.

When jurors do understand the expert's testimony, impressive credentials and technical language may boost the influence of an expert.[46] When the expert's lack of clarity prevents jurors from understanding the testimony, the expert is less likely to successfully persuade the jurors.[47] This pattern is consistent with the literature on persuasion which indicates that use of obscure and unusual words generally reduces persuasiveness[48] and with models of attitude change that emphasize reception as a precondition to yielding.[49] Jurors may give less credence to an expert who uses jargon if the jurors interpret it as obfuscation or if the expert displays other evidence of potential bias such as an unusually high rate of pay.[50]

The jury has one advantage over judges when dealing with expert evidence. Neither judge nor jury is likely to be an expert on

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LAW & HUM. BEHAV. 269, 284 (1990); Vidmar & Diamond, *supra* note 5 at 1143.

[45] *See* sources cited *supra* note 37 and accompanying text.

[46] *See* Joel Cooper, Elizabeth A. Bennett, & Holly L. Sukel, *Complex Scientific Testimony: How Do Jurors Make Decisions?*, 20 LAW & HUM. BEHAV. 379, 382 (1996).

[47] *See* Diamond & Casper, *supra* note 21, at 542, 543.

[48] *See generally* John Waite Bowers, *Language Intensity, Social Introversion, and Attitude Change*, 30 SPEECH MONOGRAPHS 345 (1963).

[49] *See* William J. McGuire, *Attitude Change: The Information Processing Paradigm*, *in* EXPERIMENTAL SOCIAL PSYCHOLOGY 108 (Charles Graham McClintock ed., 1972).

[50] *See* Joel Cooper & Isaac M. Neuhaus, *The "Hired Gun" Effect: Assessing the Effect of Pay, Frequency of Testifying, and Credentials on the Perception of Expert Testimony*, 24 LAW & HUM. BEHAV. 149, 150–51 (2000).

the technical substantive content that an expert may offer, but the jury is more likely to have at least one member who has a substantive technical background or some training in science. How jurors should use this quasi-expertise in the jury room is the subject of some debate,[51] but there is no doubt that jurors do draw on their experience, whether such experience is technical, scientific, or otherwise, when responding to the evidence at trial. Although there is no evidence that complexity induces a greater rate of disagreement between judges and juries on the appropriate verdict,[52] complexity nonetheless presents a general and unavoidable challenge to legal decision-making that is not unique to jury trials.

III. WHAT JUDGES CAN DO

A judge who is motivated to optimize how juries handle expert testimony has a number of tools available. As most studies of the jury show, when jurors enter the courtroom, they are interested in learning and eager to reach a correct decision. Judges can facilitate the learning process. In 1993, Judge Michael Dann provided a blueprint for how to optimize juror understanding when he offered an education model that included innovations such as allowing juror note-taking, permitting juror questions during trial, and instructing the jury on the relevant law before the trial begins.[53]

Some courts have adopted these procedures, but the changes have been slow and the old ways persist.[54] As we have learned from the Arizona Jury Project, permitting jurors to submit questions for witnesses reveals that the jurors have substantive questions for the experts that can be answered promptly and can

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[51] *See, e.g.,* People v. Maragh, 729 N.E.2d 701 (N.Y. 2000).

[52] KALVEN & ZEISEL, *supra* note 9, at 56; *see also* Heuer & Penrod, *supra* note 9, at 49; Eisenberg et al., *supra* note 9, at 171–72.

[53] B. Michael Dann, *"Learning Lessons" and "Speaking Rights": Creating Educated and Democratic Juries*, 68 IND. L.J. 1229, 1251–53 (1993).

[54] For a summary of current patterns in federal and state courts, *see* National Center for State Courts, The State-of-the-States Survey of Jury Improvement Efforts Executive Summary, www.ncsconline.org/D_Research/cjs/pdf/sos_exec_sum.pdf (last visited Nov. 30, 2007).

dispel some sources of confusion when they arise.[55] Other research has shown that note-taking improves recall and understanding,[56] and providing mock jurors with summaries of expert reports before the experts testify can facilitate juror understanding of the testimony.[57] If the aim is an informed decision maker, whose common sense judgments are not sabotaged by technical obstacles, the judge and attorneys can provide trial notebooks with glossaries and interim statements in order to offer further assistance in a complex expert-laden trial.

Another promising potential tool that has not yet been the subject of systematic study but is worth consideration is the scheduling of back-to-back experts. To facilitate ease in comparing the testimony of opposing experts who would otherwise testify days or even weeks apart, it may be worth adjusting the typical trial order to permit the experts to testify back-to-back. If this innovation is introduced, the judge should explain how and why this is being done (e.g., "to make it easier for you to understand the parties' evidence on these complex issues"). The advantage of the judge's explanation at this point is that it informs the jury how to deal with the change in the order of the evidence and also alerts the jurors to the fact that the evidence they will be hearing is likely to be strongly contested.

After the Science for Judges IX Conference held at Brooklyn Law School in April, 2007, Judge Jack Weinstein asked for suggestions on "any special instructions that should be given jurors in a case that turns on scientific evidence about how to handle the evidence."[58] My own sense from studying juror efforts to use

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[55] *Juror Questions During Trial, supra* note 23.

[56] David L. Rosenhan, Sara L. Eisner & Robert J. Robinson, *Notetaking Can Aid Juror Recall*, 18 LAW & HUM. BEHAV. 53, 59 (1994); Irwin A. Horowitz & Lynne ForsterLee, *The Effects of Note-Taking and Trial Transcript Access on Mock Jury Decisions in a Complex Civil Trial*, 25 LAW & HUM. BEHAV. 373, 382–89 (2001).

[57] Lynne ForsterLee, Irwin Horowitz, Elizabeth Athaide-Victor, & Nicole Brown, *The Bottom Line: The Effect of Written Expert Witness Statements on Juror Verdicts and Information Processing*, 24 LAW & HUM. BEHAV. 259 (2000).

[58] E-mail from Margaret Berger, Suzanne J. & Norman Miles Professor of Law, Brooklyn Law School to Shari Seidman Diamond, Howard J. Trienens

expert testimony appropriately is that the typical jury instruction that a judge delivers at the end of the trial comes too late. A better approach to focus and assist jurors would involve an earlier intervention: an instruction just before an expert testifies noting that the complexity of some expert testimony poses a special challenge, and the jurors may find it useful to submit questions for the expert at the end of the expert's testimony.

Explicit judicial acknowledgement of the complexity of expert testimony, coupled with an indication from the judge that juror questions would be appropriate at the conclusion of the witness's testimony, would serve a dual purpose. First, it would signal to the jurors that the witness will be delivering important and potentially difficult information. Second, it would convey the message that it is acceptable for a juror to ask what might appear to be a "dumb" question. Although there is no reason to permit jurors to submit questions only for expert witnesses, this special instruction on submitting questions for experts could occur whether or not juror questions are permitted for other witnesses.[59]

The easiest path for judges to take in conducting jury trials is to avoid any unnecessary communication with the jury during the trial, to follow traditional orders and procedures, and to depend solely on the efforts of the parties to enable the jurors to understand the evidence. Adopting this passive judicial model avoids criticism; moreover, attorneys may prefer judges to stay in the background as much as possible during trial. It does make some sense to be cautious because jurors are aware of the alignment of witnesses and attorneys, and, viewing the judge as a more trustworthy source of information, jurors may look for cues from the judge.[60] As one of the Arizona Jury Study deliberations made

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Professor of Law and Professor of Psychology, Northwestern University School of Law (April 27, 2007, 11:49 EST) (on file with author) (Judge Weinstein's question was conveyed by Professor Berger in an E-mail to Shari Seidman Diamond and Valerie Hans).

[59] Warren D. Wolfson, *An Experiment in Juror Interrogation of Witnesses*, 12 CHI. B. ASS'N REC. 1, 12, 13 (1987).

[60] Peter David Blanck & LaDoris Hazzard Cordell, *The Appearance of Justice: Judges' Verbal and Nonverbal Behavior in Criminal Jury Trials*, 38 STAN. L. REV. 89, 93 (1985).

clear, the judge is never invisible:

> Juror #1: I've got to say, the judge is really good at keeping a poker face. (Several other jurors: Yeah) Because I mean through all that testimony, through the little heated debates that go on. The attorneys sure seemed to get upset a couple of times or acted like they were.
>
> Juror #4: You've got to have an opinion on something.
>
> Juror #1: I know! I looked at him the whole time, and he never. . .
>
> Juror #6: [interrupting] So did I!
>
> Juror #1: [continuing] Well, not the whole time, but he never made a face. I never got the feeling that he thought one thing or another. And that's a skill.
>
> Juror #5: Yeah.

None of the procedures suggested here, many of them currently used in the Arizona Jury Study courtroom that produced this juror exchange, alter the impartial position of the judge in this example. All are neutral ways to reduce unnecessary juror confusion. The judge who uses these methods thus can serve all of the trial participants—parties, jurors, and experts—without favoring, or appearing to favor, any one of them.