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Judging Experts:

 What Real Jurors Do †

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Expert witnesses have been called upon to assist triers of fact in Anglo-American courts for nearly 400 years.[[1]](#footnote-1) In the modern jury trial, experts are frequent witnesses.[[2]](#footnote-2) The legal system acknowledges the potential value of expert testimony when the trier of fact, whether judge or jury, must evaluate evidence about unfamiliar topics (e.g., the effect of speed on injuries caused by a collision; how to tell if the object found in a sandwich was plant, animal, or something else; the future medical expenses and loss of earnings an injured party is likely to sustain). Yet experts elicit an ambivalent reaction from the legal system. On the one hand, the legal system grants an expert unusual latitude based on the assumption that the expert's special knowledge and experience can provide information and evaluation that will assist the trier of fact in understanding complex or unfamiliar concepts.[[3]](#footnote-3) On the other hand, courts often express concern that an expert hired by one party may present biased testimony that inaccurately favors the side that hired the expert, and that the expert's testimony may be unduly influential because of his or her credentials or skill as a witness or because the court has officially identified the witness as an expert.[[4]](#footnote-4) The gate-keeping function of the judge under *Daubert* and its progeny and under FRE 702 envisions that the judge will prevent unreliable evidence from entering the courtroom during trial,[[5]](#footnote-5) but this gate-keeping responsibility depends on judges who are also laypersons with respect to much expert knowledge. Moreover, even if judicial gate-keeping acts as an effective screen, it does not provide guidance on how admitted expert testimony should be processed and evaluated. A unique opportunity to examine jury behavior during actual deliberations in civil cases allows us to test some of the claims made about how jurors evaluate expert witnesses in civil cases.

Although judges, like jurors, are laypersons on scientific and technical topics, concern about the evaluation of expert testimony most often focuses on the jury. While legal commentators acknowledge the value of expert testimony in informing the jury about topics beyond the jury's ordinary experience, they often express doubts about the ability of the jury to distinguish experts from charlatans, and to understand and give appropriate weight to the testimony of experts. The traditional concern is that jurors will be unduly prejudiced, confused or misled by expert testimony because of "its aura of special reliability and trustworthiness."[[6]](#footnote-6) According to a related, but inconsistent image, the battle of the experts that often takes place in the courtroom may produce a "plague on both your houses" reaction, in which the conflicting testimony leads jurors to ignore relevant expert testimony and fall back on other sources in order to reach a verdict.[[7]](#footnote-7)

In response to these concerns about juror reactions to experts, we can use the data from the Arizona Jury Project to address the following questions:

1) How much attention do jurors give to experts during deliberations? What factors predict how much attention an expert gets? [part III]

2) How do jurors talk about experts? Do their remarks about experts and expert testimony reflect a substantive engagement with the information? Or do jurors reduce experts to superficial characteristics, such as their mannerisms or style (what psychologists call “peripheral cues”?”) [part IV]

3) How do jurors respond to “battles of the experts” offering opposing testimony on the same issue? Do they engage in resolving the conflict, or do they tend to avoid talking about those experts? [part V]

Previewing our results, in contrast to the portrait that critics paint of jurors and experts, we find that the jurors do not ignore the potential assistance offered by expert testimony. Moreover, they focus primarily on the content of the expert’s testimony. Juror discussion about some peripheral expert characteristics, such as credentials and experience, is modest, and they rarely discuss others cues (e.g., appearance) during their deliberations. Arizona jurors are permitted to submit questions during trial for witnesses, including experts, and many of their questions are for the experts. Their questions, like the deliberations, reveal a focus on the content of expert testimony.

The jurors are wary of some claims by experts, conscious of the adversary setting that produces expert testimony. When faced with opposing experts, the jurors compare the content and quality of the opposing arguments; we find little evidence of a mechanical “canceling each other out” response. Instead, jurors’ strategies for evaluating expert testimony, as with other types of evidence, rely on reference points (e.g., if the opposing experts agree on an issue, that agreement is trustworthy; if an expert concedes a point that assists the opposing side, the conceded point is trustworthy). Although the jurors did not always show a complete understanding of the expert testimony, they did not reach conclusions that appeared to be inconsistent with the weight of the expert evidence.

We conclude that questions about the ability of courts to ensure the appropriate use of expert content are real, but they arise less from a jury problem than from larger system challenges. We describe the sources of some of these challenges to set the stage for greater efforts to facilitate the proper use of high quality expertise in legal proceedings.

We begin in Part I with a brief overview of the Arizona Jury Project and a description of the procedures used for data collection.

I The Arizona Jury Project

*A. Overview of the Study*

 The Arizona Supreme Court sanctioned a videotaping project in Pima County that gave us the unique opportunity to videotape the deliberations of 50 civil juries in the Pima County Superior Court in Tucson.[[8]](#footnote-8) The project required an elaborate set of permissions and security measures.[[9]](#footnote-9)

B. *Selection of Jurors and Cases*

The jurors, attorneys, and parties were promised that the tapes would be viewed only by the researchers and only for research purposes.[[10]](#footnote-10) 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. The juror participation rate was over 95 percent.[[11]](#footnote-11) Attorneys and litigants were less willing to takepart 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.[[12]](#footnote-12)

C. *The Videotaping Procedures*

In each case, the entire trial was videotaped from the opening statements to the closing arguments and jury instructions. Arizona does not audiotape or videotape court proceedings, so we installed an unobtrusive camera in each of the courtrooms of participating judges. The camera was focused on the witness box in order to capture as much of what the jurors saw as possible.

The jury rooms used for the research included two unobtrusive cameras were mounted in opposite corners of the room at the ceiling level. These cameras made it possible to see jurors seated around the rectangular table on a split screen without disrupting their normal seating arrangement. Unobtrusive ceiling microphones recorded the discussions. We instructed an on-site technician to tape the conversations in the jury room whenever at least two jurors were present.

*D. Data Collection and the Final Sample*

 In addition to videotaping the discussions and deliberations, we also videotaped the trials themselves and collected the exhibits, juror questions submitted during trial, jury instructions, and verdict forms.[[13]](#footnote-13) The jurors, attorneys, and judge also 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: twenty-six motor vehicle cases (52 percent), four medical malpractice cases (8 percent), seventeen other tort cases (34 percent), and three contract cases (6 percent).[[14]](#footnote-14)

The 47 tort cases in the total sample varied from the common rear-end collision with a claim of soft tissue injury to cases involving severe and permanent injury or death. Awards ranged from $1,000 to $2.8 million dollars with a median award of $25,500**.**

*E. The Data*

1. The Trials

We transcribed the opening and closing arguments in each case from the trial videotape. We also created a very detailed “road-map” of the trial from the videotaped trial.

2. Data from the Deliberations

We created verbatim transcripts of all deliberations, producing 5276 pages of deliberation transcripts for the fifty trials. The deliberations consisted of 78,864 comments by the jurors, each of which was coded on a variety of dimensions. A comment, akin to a turn, was defined as a statement or partial statement that continued until the speaker stopped talking or until another speaker’s statement or partial statement began. If another speaker interrupted, but the original speaker continued talking, the continuation was treated as part of the initial comment. For example, here Juror 2 is in mid-sentence when Juror 4 interrupts to agree before Juror 2 completes his comment:

 Juror 2: Negligence and cause of death … [are] also in the

 fact of what you don’t do—

 Juror 4: I, I agree.

 Juror 2: to prevent it.

In this instance, Juror 2 was credited with one comment and Juror 4 was credited with one comment.

II The Experts and Their Testimony

Expert witnesses are a common feature of modern civil litigation and in the Arizona Jury Project. They appeared in 86 percent (n=43) of the cases,[[15]](#footnote-15) almost always through live testimony (92%) rather than deposition. In all, there were 2.8 expert witnesses per case, and they accounted for nearly a third (31.5%) of all 441 witnesses in these cases.[[16]](#footnote-16) In keeping with the dominance of personal injury claims in state civil cases, including those in Pima County, the expert witnesses in the Arizona Jury Project disproportionately had medical expertise (64.0%).[[17]](#footnote-17) The majority of experts with medical expertise were MDs, but a minority had non-MD medical backgrounds (e.g., 10.1% were chiropractors; 5.0% were clinical psychologists). MD specialties varied; these experts were anesthesiologists, cardiologists, neurologists, orthopedic surgeons, pathologists, and psychiatrists. Fifty-two (37.4%) of the experts provided the plaintiff with some form of medical treatment [treating “physicians”]. Financial experts accounted for 15.1% of the experts; engineers, scientists, and others who offered accident reconstruction testimony accounted for 13.7% of the experts. The remaining 7.2% of experts had a range of specialties (e.g., biologist, human factors expert, architect). Experts in nine cases testified about standards of behavior (four involving medical standards, five involving construction or other standards). Plaintiffs called the majority (63.3 percent) of the experts.[[18]](#footnote-18) Of those 88 plaintiff’s experts, the majority (59 percent) were treating physicians.

The majority of experts (73.4 percent) faced at least one opposing expert witness.[[19]](#footnote-19) We determined status as an opposing expert by the nature of the testimony the experts offered. Thus, two experts were opposing if they testified on the same general issue, even if they did not have to have precisely the same educational or occupational specialty. For example, an engineer who testified that the speed of the impact would not have caused the alleged injuries was an opposing expert for an accident reconstructionist who did not having an engineering background. In contrast, a psychiatrist who testified that the defendant was not clinically depressed was not an opposing witness for the orthopedic surgeon who testified about the plaintiff’s physical injury.

The 43 trials with experts averaged 12.2 hours (mdn = 9.3 hours) of “on-stage” substantive trial time, counting opening and closing arguments, evidence presentation, and judicial instructions given at the beginning and end of the trial.[[20]](#footnote-20) The count included only time spent in the courtroom when the empaneled jury was present. If the court met with the attorneys to hear motions before the jury was called to the courtroom for the day or during an extended break when the jury was excused, that time was not included in the tally.[[21]](#footnote-21) Counting this way permitted us to see the evidence, instructions, and argument in the trial from the perspective of the jury and to assess, for example, how much of the trial time was consumed by the evidence from experts or from a particular type of expert.

In the trials with experts, expert testimony accounted for an average of 4.0 hours per trial, occupying an average of 32.5 percent of the average trial time with at least one expert. The average expert was on the witness stand for 73.9 minutes (mdn = 61.0 minutes), but the variation in length of testimony was substantial, from ten minutes to almost eight hours (465 minutes).[[22]](#footnote-22) The percentage of trial time per expert averaged 10.4 percent (mdn = 9.3 percent), ranging from 0.4 percent to 27.9 percent.[[23]](#footnote-23)

III Juror Talk about the Experts

 How much attention do jurors give to experts during deliberations and what factors predict how much attention an expert gets? According to one hypothesis about how jurors respond to expert testimony, jurors generally cannot understand experts, and they cope with that inability by simply ignoring expert testimony. In fact, in the deliberations we studied, the jurors talked about most (88.5 percent) of the experts, making an average of 34.2 references to each expert (mdn = 18.0).[[24]](#footnote-24) But if they did not ignore the experts, what influenced which experts received their attention?

*A. Time Spent on the Witness Stand*

One potential measure of witness importance is the length of time the witness spends testifying. Length of time testifying is an imperfect indicator: a crucial expert might be succinct, while a blowhard might provide little useful evidence. Highly technical evidence might take substantial time to explain, even if it provides testimony on a minor issue. Nonetheless, we would expect that attorneys would spend more of their time at trial bringing out the testimony of witnesses they see as likely to be particularly helpful or attempting to undermine the testimony of witnesses who offer potentially damaging evidence.

We used two ways to characterize the length of a witness’s testimony: the absolute length of time testifying [minutes of testimony] and the percentage of the trial time occupied by the expert’s testimony [percentage of trial minutes]. If time on the witness stand, in absolute or relative terms, is an indicator of witness importance, it should predict the amount of jury talk about that witness during deliberations if jurors are attending appropriately to the expert evidence presented at trial. Jurors should focus more attention on the expert witnesses who provided more evidence. We anticipated that the relative measure of trial time (percentage of time during trial that the witness was on the stand) would be a better measure of witness importance than absolute number of minutes on the witness stand because the relative measure would control for the competing sources of potential influence on the jury in each trial.

 As with the two measures of time testifying, we computed absolute and relative measures of juror talk about an expert during deliberations: the total number of references jurors made to the expert [total references] and the total number of references as a percentage of total comments made during the deliberation in that trial [percentage of trial comments].[[25]](#footnote-25)

Did time on the witness stand predict the attention experts received during deliberations? The proportion of trial time for the expert was significantly correlated with the amount of talk about that expert during deliberations, both for total references to that witness (r. = .34, p<.001) and for the percentage of talk about that witness (r=.37, p<.001). Absolute time on the stand (minutes of testimony) was very slightly correlated with total references during deliberation (r = .18) and not at all related to the proportional number of witness references (r .08). Table I shows the full set of correlations between measures of expert witness testimony and juror talk about that expert during deliberations:

Table I Correlations Between Witness Testimony and Juror Talk

|  |  |  |  |
| --- | --- | --- | --- |
|  | Proportional Minutes (Minutes of testimony/Total minutes of trial) | Total References (Total number of juror references to the expert) | Proportional References (Number of juror references/Total number of comments in deliberation) |
| Total Minutes of expert testimony |  .434\*\* |  .177\* |  .076 |
| Proportional Minutes (minutes of testimony/total minutes of trial) |  1 | .341\*\*\* | .368\*\*\* |
| Total References |  |  1 |  .880\*\*\* |

\*p<.05; \*\*p<.01; \*\*\*p<.001

In other words, if we treat the proportion of time that an expert occupied center stage during the trial as a measure of the importance of the expert’s testimony, deliberation talk mirrored that pattern in the amount of attention jurors gave to that witness. Rather than disregarding the experts, jurors were discriminating in how they allocated their attention. Their discussion of the experts during deliberations reflected the relative amount of attention the experts received during the trial.

*B. The Relevance of the Expert Witness*

Fifteen experts in seven cases provided evidence that related only to issues that became legally irrelevant. The testimony focused solely on damages and the jury determined that the defendant had not been negligent or that the defendant’s action had not caused any injury, or (in one case) two opposing experts testified on a claim that the judge ultimately threw out before the jury began its deliberations. Because there could have been spillover effects from the testimony of these “irrelevant” experts, we examined jury response to these fifteen irrelevant experts. The testimony of these irrelevant experts was not perfunctory: they averaged 86.5 minutes (mdn = 52) on the witness stand, while relevant experts averaged 72.3 minutes (mdn = 62).[[26]](#footnote-26) Yet the jurors spent little time on these irrelevant witnesses during deliberations. While the jurors mentioned relevant experts an average of 37.8 times per expert (mdn = 21), they mentioned irrelevant experts an average of 3.7 times per expert (mdn = 2).[[27]](#footnote-27) These comments about the irrelevant experts generally referred to their irrelevance (e.g., #5: “Does anybody think the medical testimony makes any difference?” #7: “No”; #6 [looking through exhibits]: “All I see are doctors’ stuff.”).[[28]](#footnote-28) The only mentions of one excluded expert were about his hourly rate and a single comment by #6: “We would have been in the millions if [the claim had not been excluded and the jury had found liability on that claim].” Although we cannot tell whether the testimony of these legally irrelevant experts affected juror thoughts or decisions, the deliberations themselves focused elsewhere.[[29]](#footnote-29)

*C. Plaintiff vs. Defense Experts*

Expert witnesses called by the plaintiffs on average did not testify significantly longer than those called by the defense, either in total minutes (77.4 versus 67.7 minutes per expert) or in proportional minutes (10.8 percent versus 9.7 percent per expert). Plaintiff experts, however, did attract more attention during deliberation. Jurors spoke more than twice as often about plaintiff experts, both in total references (43.2 versus 18.6 references per expert, t=3.67, p<.001) and in proportional references (3.7 percent versus 1.9 percent per expert, t=3.22, p<.002). The difference was primarily attributable to more juror talk about the treating physicians who testified as plaintiff experts. Thus, jurors discussed the treating physicians significantly more than defense experts (50.2 versus 18.6, p<.01), while discussion of other plaintiff experts was not significantly greater than for defense experts (33.1 versus 18.6)[[30]](#footnote-30) The greater attention to treating physicians was not attributable to more time testifying. The treating physicians averaged fewer minutes of testimony than other plaintiff’s witnesses (67.1 versus 92.4 minutes of testimony, while the defense experts averaged a similar 67.7 minutes of testimony.

Instead, the more extensive talk about treating physicians reflected the dual role they play. That is, they are both fact witnesses and expert witnesses, testifying to their treatment of the plaintiff as well as the diagnosis and prognosis of the plaintiff’s injury based on their medical expertise. Thus, they provided evidence on the story of damages alleged to have been caused by the defendant’s actions as well as the treatment they administered to the plaintiff. (e.g., a treating clinical psychologist described her psychotherapy treatment for the plaintiff whose clinical depression she attributed to the loss of the plaintiff’s husband). In some cases, the treating physician had treated the plaintiff prior to the event that stimulated the lawsuit, so the expert also provided relevant evidence about pre-existing injuries (e.g., the physician reported that he had previously treated the plaintiff for a back injury. The pain in her legs was a new finding and not consistent with prior complaints before the accident). The pattern of juror attention to these witnesses thus reflected the hybrid nature of the testimony. Consistent with their efforts to reconstruct the nature and sequence events leading to the trial (i.e. the “story”),[[31]](#footnote-31) the jurors paid particular attention to experts who could assist them on both technical and non-technical matters.

*D. The Educational and Professional Background of the Expert*

Jury instructions typically advise jurors to consider “education and experience” in judging expert testimony, reflecting the commonsense notion that such cues can be useful indicators of expertise. The Arizona jurors received the follow instruction on how to judge expert testimony:

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, [emphasis added] the reasons given for the opinions, and all the other evidence in the case.

Other jurisdictions have similar jury instructions.

We interpret “experience” to cover the nature of expert’s area of expertise (e.g., neurosurgery, human factors, economics), the length of time the expert has been engaged in the profession or activity in her area of expertise (e.g., years as a neurosurgeon), and the fit (or lack of fit) between the expert’s specialty or experience and the subject matter of the case in which the expert was testifying. A reference by a juror to an expert’s education or experience can be positive or negative (e.g., “Ya’ know, you’re talking about physiologist compared to forensic pathologist.”).

We identified 32 experts who drew at least one observation about the expert’s education or experience. We anticipated that jurors would be more likely to attend to the experience and education of experts they viewed as more central to the case. Therefore, although these 32 experts averaged only 3.6 comments about credentials per expert, we predicted that they would receive more overall attention from the jury than other experts. In fact, they received substantially more attention, an average of 68.7 references versus 23.8 references for other experts (t=3.87, p<.001), and 6.0 percent of the references versus 2.1 percent for other experts (t=5.40, p<.001).

The patterns presented here show that jurors tended to direct their attention to experts in reasonable directions. However, that does not address to question of whether they took in the information those sources conveyed. To provide that assessment, we turn now to an examination of the nature of juror talk about experts.

IV The Nature of Juror Talk about Experts

How do jurors talk about experts? Do their remarks about experts and expert testimony reflect a substantive engagement with the information? We can test the claim that jurors are befuddled by expert testimony by examining what jurors say during deliberations in response to that testimony. In the adversary trial setting, it is expected that the experts called as witnesses by each side will attempt to persuade the trier of fact to accept as correct the view they are presenting. Research on attitude change and decision making indicates that two basic types of cognitive processes are used in response to persuasive attempts. 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—her occupation or education—provides a peripheral cue to the decision maker that he should accept the claims that the high prestige communicator, the expert, is making. If jurors were motivated to avoid the effort of evaluating expert evidence, or if they were befuddled and unable to process the information an expert was offering, they could simply defer and accept the conclusions without engaging in any deeper processing. Jurors taking this short cut 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, central or systematic processing, occurs when a decision maker is motivated to understand and evaluate a persuasive communication. A person engaged in central processing scrutinizes the quality of the arguments and does not simply defer to the claims of a prestigious source or reject the position presented by a less credentialed one.

The claim that juries mechanically defer to sources with impressive credentials or a confident manner of presentation, rather than scrutinizing the content and quality of the testimony, is a claim that jurors engage primarily in peripheral rather than central processing. Research on persuasion indicates that central processing takes place when people are strongly motivated to understand a message and have the intellectual ability to grasp the arguments. When they are unmotivated or unable to process the message, they take cognitive shortcuts and rely on peripheral cues.

The image of the befuddled or unmotivated juror response to experts – and therefore a befuddled and unmotivated jury – would predict that the conversation during deliberations would focus on peripheral cues to credibility, that is, peripheral processing, rather than on the content of the testimony, central processing. It is understandable that such a strategy might have the attraction for jurors of reducing juror workload by enabling the juror to avoid effortful processing of potentially difficult-to-understand material. Yet to the extent that jurors who are given a responsibility that has serious consequences for the parties are motivated to reach a “correct” answer, they might be willing to exert unusual effort not seen outside the courthouse.

To measure how the jurors processed expert testimony, we coded each comment in which an expert was mentioned on the nature of the reference the juror made about the expert. The peripheral route to persuasion was captured in juror comments in which a juror used a “shortcut” to determine whether they trusted the expert or the expert’s message. These heuristics or “shortcuts” do not show that the juror is assessing the testimony directly. Peripheral comments include references to:[[32]](#footnote-32)

Credentials – comments about the expert’s credentials, education, or other qualifications which could make the expert’s testimony more or less valid) (e.g., “You know, you don’t get where he is without, you know genius. This guy, if you go to MIT, you’ve got to have a head for math, I mean you got to really know what the hell you’re doing.”)

Motive – comments about the expert’s potential motives (e.g., “he really sounds like such a hired gun”)

Manner – comments about the expert’s personality or manner of testifying that jurors believe have implication for the validity of their message (e.g., “He seems a little arrogant”; “Just his whole demeanor”; “And he got kind of defensive when the lawyer asked him.”)

Appearance – comments about the expert’s appearance (e.g., “he just looked like a crook”; “his wife shouldn’t let him out of the house like that”)

In contrast, evidence of the central processing occurred when a juror’s comment provided evidence that the juror had processed some substantive portion of the expert’s testimony. To qualify as a central comment the juror had to process and recall the content of the expert’s testimony enough to be able to recount it (e.g., “[The expert] didn’t have knowledge of the medication”; [The expert] said there was scar tissue on the x-ray that came from an earlier injury, so the accident probably did not cause the back problems.”

We coded every explicit reference a juror made to an expert for central and peripheral content. If the same comment contained both central and peripheral content, it received both codes. The majority of comments jurors made about the 123 experts discussed by the jurors included evidence of central processing (mean = 52.0 percent; mdn = 52.6 percent), while a minority (mean =12.2 percent; mdn = 3.4 percent) referred to peripheral cues. The remaining explicit references to an expert contained no processing information (e.g., “I think [the doctor] testified yesterday” or “What was the name of the plaintiff’s expert?” or “I didn’t believe [the expert]” with no reason given for that conclusion). Among the 123 discussed experts, 92.7 percent were the subject of at least one centrally processed reference, while only 60.2 percent of those experts drew any peripherally processed references. The average expert received 18.0 central references and 3.2 peripheral references. A comparison of percent central and percent peripheral references for the 123 experts discussed by the jurors was significant (tpr=-10.79, p<.001). The relatively small number of peripheral processing references primarily referred to the motive of the expert as a paid witness (mean = 2.0) or to the credentials of the witness (mean = 0.9). References to manner were uncommon (mean = .25) and appearance was rarely mentioned during the deliberations (mean = .02).

Of course, because peripheral cues were not the subject of much talk, that does not mean that they did influence the jurors, but the comparison between the frequency of the centrally processed and peripherally processed comments provides evidence that jurors responding to the expert testimony engaged in some of the more cognitively effortful attention during deliberations.

The questions jurors posed for witnesses during trial also show how the jurors reacted to the expert testimony. Jurors in Arizona are permitted to submit questions in writing to the judge after a witness testifies and before the witness leaves the witness stand. If jurors engaged primarily in peripheral processing, we would expect them to ask few questions of expert witnesses or to ask questions only about witness credentials or experience. In fact, jurors submitted questions for almost half (47.5%) of the expert witnesses, averaging 2.11 questions per witness. Only fifteen (5.8%) of the 257 questions concerned credentials or experience. Instead, the nature of the questions generally reflected attempts by the jurors to understand and evaluate the content of the testimony. Many of the questions focused on alternative possible causes for the plaintiff’s injury. 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?” Others simply tried to clarify 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 what occurred as a result of the 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. Although engagement of the juror questions with the content of the expert testimony does not mean that jurors reached their decisions based on the information that emerged in response to these questions, it adds further evidence that the jurors did not avoid directly dealing with the content of the expert testimony.

There is one common situation that arises in trials, the so-called “battle of the experts” involving opposing testimony on the same issue that may present a particular challenge to jurors, perhaps encouraging avoidance rather than engagement. We focus next on that situation.

 V Opposing Experts

The “plague on both their houses” view of experts would predict that jurors would talk little about opposing experts, who would simply cancel each other out. The talk about experts in our deliberations contradicts that image. Although the 102 experts who faced an opposing expert witness did tend to testify longer at trial than 37 unopposed experts, both in raw minutes (82.6 versus 49.8 minutes, t=4.05, p<.001) and as a percentage of trial time (11.3 versus 7.7, t=-3.16, p<.01), jurors did not ignore the experts who faced opposition. Jurors were at least as attentive to opposed experts as to unopposed experts, both in raw number of references (35.2 versus 31.1) and as a percentage of deliberation talk (3.2 versus 2.5 percent). Nor did we find evidence from juror talk during deliberations that jurors were using a conscious “canceling out” strategy to evaluate the opposing experts. In only three cases, did a juror argue that the opposed experts canceled each other out. The first case involved a medical malpractice case in which two opposing doctors testified. After the jury spent time reviewing the evidence, Juror #2 offered a view:

“I almost think, in my case, I almost have to throw just about everything the doctors talked about out of my mind because they both have points. But what do those points prove? Were either one of them more right than the other? They agreed about a lot of things and disagreed about the major point: did the [defendant’s action] cause damage?”

The jury found for the defendant, so it could be argued that the opposing experts canceled each other out, producing a win for the defendant merely because of the presence of an opposing expert. But the jurors did not stop discussing the evidence after Juror #2 suggested that the experts canceled each other out. What followed this comment was a discussion about whether the defendant physician met the standard of care, whether the claimed symptoms of the plaintiff were consistent with the alleged injury, and why no additional expert-recommended diagnostic testing had been done (e.g., “there is so much – so many more medical tests that they could have done to prove their points, and nobody did it” drawing on testimony from the defense expert on the kind of test that could be done to check for permanent injury on the allegedly damaged nerve. In the end, the jury concluded that the plaintiff had not met his burden of proof. But what led to this conclusion by the jury was an extended discussion of the plausibility of the claims rather than a swift dismissal of the expert testimony.

 In the second case, opposing clinical psychologists disagreed on the plaintiff’s psychological problems and likely future health, leading one juror to observe:

You know, I wonder how much we can put on both the shrinks because one of

them contradicted the other one. They both used the same books. One of them

was paid by the plaintiff. One was paid by the defendant. [Plaintiff’s expert] got

up there and said how [the plaintiff’s] life is going to be wrecked… That’s baloney!

Here, although the juror floats the idea of a canceling out of competing claims, he concludes with a clear rejection of one of the experts.

 In the third case, five experts, three medical experts and two accident reconstructionists, testified about the likely extent of the plaintiff’s injury caused when her automobile was rear-ended. In the course of comparing the experts’ testimony, one of the jurors characterized one of the experts as a hired gun, observing “So were the other guys. They all were.” The following exchange then took place:

 Juror #4: They cancel out each other.

 Juror #7: On both sides. Yeah, on both sides.

 Juror #3: They say there’s 3 sides to every story.

The jurors then returned to conversation about the content of the expert testimony. They discussed whether one of the experts used an inappropriate test to estimate the force of the collision and the consequence, discussed during the expert testimony, of the collision being bumper-to-bumper (e.g., “Think about this. Bumper-to-bumper would mean that the bumper was designed to stand more energy, right, than the tailgate.”).

 In both the second and third cases above, an awareness of the adversary context of the expert’s testimony appeared to lead to some balanced discounting, akin to canceling out, but in none of the cases did a canceling out suggestion derail the jurors from engaging further with the substance of the experts’ testimony.

To further investigate how jurors responded to opposing experts, we examined how favorably or unfavorably they responded to experts who were more, equally, or less credentialed that the opposing witness. We compared each pair of opposing experts on two forms of credentials, education and professional experience. If one of the experts had greater education (e.g., an MD versus a chiropractor), he received a score of 1, and the opposing expert received a score of -1. If the two did not differ substantially in their educational qualifications, they both received a score of 0.[[33]](#footnote-33) We used the same scoring method to compare opposing experts on amount of professional experience. We then added the two scores together. If jurors relied on differential credentials to help evaluate expert testimony, those with positive scores (.5 to 2) should have been more highly rated than those with equivalent (0) or negative scores (-2 to -.5).

To measure how jurors rated an expert, we categorized each juror comment about the expert as positive, neutral or negative and computed the percentage of positive and negative responses to each expert. Table II shows that witnesses with superior credentials tended to receive a higher percentage of favorable comments from jurors during deliberations and a lower percentage of negative comments than opposing witnesses with equivalent or inferior credentials.

Table II Expert Ratings Associated with Expert Credentials

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Valence of Expert Comments | Superior Credentials(n=25) | Equivalent Credentials(n=40) | Inferior Credentials(n=30) | Overall F-value | Overall p-value |
| Percent Positive | 66.3%a\* | 43.1%c | 39.9%c | 7.16 | p<.001 |
| Percent Negative | 25.0%a | 47.0%b | 45.6%b | 4.73 | p<.011 |

\*for values with different superscripts a versus b in the same row, p<.05;

 for values with different superscripts a versus c in the same row, p<.01

This relationship between expert credentials and the valence of juror response to the expert provides a potentially important indicator of how jurors deal with expert testimony. These results suggest that experts with superior credentials, either because of their greater knowledge and ability to communicate convincing content or because their credentials caused jurors to be more attentive to, and impressed by, what they are said, were received more favorably by the jurors. Although jurors spent most of their time on experts during deliberations discussing the content of testimony (central processing), they did not ignore expert credentials. That is, their behavior was consistent with what the jury instructions told them to do in evaluating the experts.

Concluding Remarks

 We have examined how jurors talk about experts in order to test a number of widespread claims that jurors neglect or are indiscriminate in reacting to expert testimony. Our results show that the jurors engage with expert testimony and make an effort to process what the experts say. The problem with experts, at least in ordinary jury trials, is not the jury –or at least not in the ways that the jury has been criticized. The larger question is whether laypersons - jurors or judges – give appropriate weight – or relative weight – to the testimony of the experts who appear in court, and how the legal system can optimize the quality of expert advice and the ability of the trier of fact to appropriately use that advice in reaching a verdict. The challenge is even greater for the growing body of more technical scientific expert advice. At least three features of the current legal system make assessment of expert testimony unduly challenging (this is a beginning list – we hope to expand it with your help):

1) The selection process is invisible to the trier of fact. As one juror in the Arizona Jury Project said, “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]?” The juror had a sense of the perennial problem of bias in the selection of experts. Although there have been regular calls for increased use of court-appointed experts, there are other alternatives that could combat the lack of bias information: disclosure of experts consulted, ability to present surveys of relevant experts about good practices or the landscape of scientific opinion on the relevant issue.

2) Issues of agreement and dispute between opposing experts are not always clear. Australia and at least one American federal judge have experimented with joint reports from opposing experts and other procedures to narrow and sharpen the bases for disagreement. Less dramatic changes are also possible: e.g., making expert reports available to jurors, as some judge have permitted [get cite];

3) There may be real disputes in the scientific community that are daunting for any trier of fact to navigate. When the U.S. Supreme Court remanded the *Daubert* case to the Ninth Circuit after clarifying the legal standard for judicial gate-keeping, Judge Kozinski captured the problem. He observed:

Our responsibility, then, unless we badly misread the Supreme Court’s opinion, is to resolve disputes among respected, well-credentialed scientists about matters squarely within their expertise, in areas where there is no scientific consensus as to what is and what is not “good science,” and occasionally to reject such expert testimony because it was not “derived by the scientific method.”[[34]](#footnote-34)

Judge Kozinski may in fact have been exaggerating the problem in that case because the conflict in the scientific community about whether Bendectin was a carcinogen had abated, but the characterization of the serious conflicts within a scientific community is a scenario that has been replicated many times.

 ………

1. † This research was supported by early research grants from the State Justice Institute (Grant SJI-97-N-247), the National Science Foundation (Grant SBR9818806), and continued funding from the American Bar Foundation and Northwestern University Law School. The videotaping project was made possible by the interest of the Arizona judiciary in examining juries with an eye toward optimizing the jury trial. For more detail on the background of the study, see Diamond et al., *infra* note 7

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 Learned Hand (1901) Historical and practical considerations regarding expert testimony, 15 *Harvard Law Review* 40 (describing the case of Alsop v. Bowtrell from 1620). [↑](#footnote-ref-1)
2. Samuel R. Gross, Expert evidence, 1991 *Wisc. L. Rev*. 1113; Stephen Breyer, Introduction. 2011. *Reference Manual on Scientific Evidence*, 3th edition. Washington, DC: Federal Judicial Center/National Academy of Sciences Press.1; Stephan Landsman (1995) Of witches, madmen, and products liability: An historical survey of the use of expert testimony, 13 *Behavioral Sciences and the Law* 131. [↑](#footnote-ref-2)
3. Fed. R. Evid. 702 [↑](#footnote-ref-3)
4. See e.g., [↑](#footnote-ref-4)
5. Add cites to *Daubert v. Merrell-Dow, Kumho, Joiner* [↑](#footnote-ref-5)
6. *U.S. v. Amaral, 488 F.2d 1148 (9th Cir. 1973).* [↑](#footnote-ref-6)
7. Jane Goodman, Edith Greene, & Elizabeth F. Loftus (1985). What confuses jurors in complex cases, *Trial* 65. [↑](#footnote-ref-7)
8. See Shari Seidman Diamond et al., Jury Discussions During Civil Trials: Studying an Arizona Innovation, 45 *Ariz. L. Rev*. 1, 4-5 (2003). [↑](#footnote-ref-8)
9. See *id*. at 17 n.39. See also *id.* at 17, for a detailed report on the permissions and security measures the project required.. As part of these obligations of confidentiality under the Supreme Court Order as well as additional assurances to parties and jurors undertaken by the principal investigators, we have changed certain details to disguise individual cases. The changes do not, however, affect the substantive nature of the findings that are reported. [↑](#footnote-ref-9)
10. See *id*. [↑](#footnote-ref-10)
11. 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. See *id.* at 22-23 (providing excerpts of comments by jurors). [↑](#footnote-ref-11)
12. *Id* at 17. [↑](#footnote-ref-12)
13. *Id*. at 18. [↑](#footnote-ref-13)
14. *Id.* This distribution is similar to the breakdown for civil jury trials for the Pima County 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. BUREAU OF JUSTICE STATISTICS, U.S. DEP’T OF JUSTICE, CIVIL JUSTICE SURVEY OF STATE COURTS, 2001, NAT’L ARCHIVE OF CRIM. JUST. DATA, available at http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/03957/version/3 (last visited Jan. 29, 2014) [↑](#footnote-ref-14)
15. This representation mirrors the 86 percent of civil jury trials with experts in California State Superior Courts in 1985 and 1986. Samuel Gross, Expert Evidence, *supra* n. 2. On average, those cases averaged 3.3 experts per trial. [↑](#footnote-ref-15)
16. The majority (62%) of the cases had 2 to 4 experts; 18% had 5 to 9 experts. 128 expert witnesses testified live; 11 were represented at trial only through their deposition testimony. [note: 3 cases had one, 7 had none; one of the seven cases without testifying experts was a summary jury trial in which medical evidence was presented in the form of expert reports.] [↑](#footnote-ref-16)
17. Gross, *supra* note 2*,* “Half of the experts in our data were medical doctors, and an additional 9% were other medical professionals-clinical psychologists, rehabilitation specialists, dentists, etc.” [↑](#footnote-ref-17)
18. *Id*. “Plaintiffs called more expert witnesses than defendants-about 64% of the total.” [↑](#footnote-ref-18)
19. *Id*. “In two-thirds of the trials with expert testimony (57% of all trials) there were opposing experts in the same general area of expertise-most often, opposing medical experts. Similarly, for over two-thirds of the appearances by expert witnesses, there were opposing experts in the same general area.” Because we had complete records of the testimony, we could identity opposing experts in the Arizona Jury Project with greater precision than was possible in the Gross research. [↑](#footnote-ref-19)
20. The usual measure of “length of trial” includes jury selection, motions, and breaks, including the lunch break. Adding that to the count would double the measure of length of trial. [↑](#footnote-ref-20)
21. Short sidebars conducted while the jury remained in the courtroom and the witness remained on the witness stand were not removed from the tally. When the trial videotape was not available, for eight full trials with experts and six additional expert witnesses from four other trials, we estimated the testimony length by multiplying the number of transcript pages by 1.2. This formula was obtained by averaging the ratios between transcript pages and video testimony where we had both values, and a check with the clerk’s minute order describing the progress of the trial. [↑](#footnote-ref-21)
22. Because we were unable to obtain a video or transcript for the testimony of three of the four experts in one case, n=136 for these averages. [↑](#footnote-ref-22)
23. *Id.* [↑](#footnote-ref-23)
24. This was a conservative measure of expert references: we considered only explicit references. Thus, if a juror said “They said the accident caused his back problems,” we did not count that as an expert reference because the comment could have referred to the plaintiff’s side in general (i.e., the attorney, or other witnesses). [↑](#footnote-ref-24)
25. The numerator is number of references; the denominator is number of comments. Jurors made a total of 4299 comments about experts, but 4748 references to experts because 9.0% of the expert comments (n=388) referred to more than one expert (e.g., “Dr. X did criticize Dr. Y’s advertising response curve” or “The doctors all say he has got pain”). [↑](#footnote-ref-25)
26. The irrelevant experts included two of the three experts who spent the longest time on the witness stand, raising the mean of this value. [↑](#footnote-ref-26)
27. t=7.35, p<.001. [↑](#footnote-ref-27)
28. Mentions of irrelevant experts occurred in five cases. [↑](#footnote-ref-28)
29. Cases varied substantially in the number of experts who testified. One case had nine experts. [↑](#footnote-ref-29)
30. The overall F for total number of references to this expert was 5.91, p=.003. Bonferroni post-hoc multiple comparisons produced a significant (p<.002) difference between the treating physicians and the defense witnesses and no significant difference between other plaintiff witnesses and treating physicians or defense witnesses. Parallel results were obtained for the number of references as a proportion of total comments in the deliberation (overall F=6.49, p=.002. [↑](#footnote-ref-30)
31. E.g., Nancy Pennington & Reid Hastie, A Cognitive Theory of Juror Decision Making: The Story Model, 13 *Cardozo L. Rev.* 519, 519 (1991); Nancy Pennington & Reid Hastie, Explaining the Evidence: Tests of the Story Model for Juror Decision Making, 62 *J. of Personality & Soc. Psychol.* 189, 189 (1992); Dan Simon, A Third View of the Black Box: Cognitive Coherence in Legal Decision Making, 71 *U. Chi. L. Rev*. 511, 583 (2004). [↑](#footnote-ref-31)
32. The comments in quotes are all taken from the actual jury deliberations. [↑](#footnote-ref-32)
33. Thirteen of the experts faced two opposing experts; if the expert had different values for the two opposing experts (e.g., more education than one, but equivalent education to the second), the raw expert score was the average of the two (in the example: (1 + 0)/2 = .5)) and the sign of the average (+, 0, or -) determined whether the score was treated as superior, equivalent, or inferior to the opposing experts on that characteristic. [↑](#footnote-ref-33)
34. *Daubert v. Merrell-Dow Pharm., Inc*., 43 F.3d 1311, 1316 (9th Cir. 1995), cert. denied, 116 S.Ct. 189 (1995). [↑](#footnote-ref-34)